

# 'Hej Hej' Sweden, 'Tak' Atlas Copco — The 2006 Atlas Copco Scholarship Experience

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## ABSTRACT

Atlas Copco is a leading provider of industrial productivity solutions (Atlas Copco, 2007) and one of the world's largest suppliers of rock drilling equipment. The business division of Atlas Copco Construction and Mining Technique is based in Örebro, Sweden with the majority of their equipment produced in a number of facilities within the area. As part of the 2006 AusIMM/Atlas Copco Scholarship I was fortunate enough to visit these facilities to experience first hand this truly unique global company.

Through numerous presentations on the various divisions and products manufactured by the company, I saw the broad range of products and services offered by the company and came to realise it is much more than just selling drills. Other highlights included a brief love affair, a tour of Europe's largest underground mine (or factory depending who you ask), a drink at the ice bar at the ice hotel in Jukkasjärvi, and a number of dinners of reindeer. Overall this it was a truly amazing experience with all involved with the program going out of their way to ensure I got the most out of the trip. More importantly, through no effort at all, everyone naturally conveyed their passion for the industry and the company which is a great credit to the 'Atlas Copco Way' thereby creating a company 'committed to your superior productivity through interaction and innovation'.

## INTRODUCTION

In February of this year I was fortunate enough to visit Sweden as part of the 2006 AusIMM/Atlas Copco scholarship another of the many benefits of studying in this great industry. Whilst I had heard of Atlas Copco as a company I knew very little about their huge range of products and their market dominance for underground equipment. As I would later realise, I was going to be getting an insight into a very unique and special company. So the trip was on and all I had to do was pick when I wanted to go and the rest would be arranged. The start of an amazing experience.

## SUMMER OR WINTER?

Sweden is a very contrasting country and where Brisbane maybe has a maximum of around 20°C temperature difference between summer and winter, some places in Sweden can have well over a 50°C change between seasons, so it is important to pick the right time of year. I had university winter holidays in June so summer in Sweden could be nice. Not going to happen. Because the Swedes love their summer so much the majority of them go on holidays during June and July, particularly around their midsummer break so there would be no-one around to look after me. Looks like the decision had been made for me, I was going in winter.

## ROUND THE WORLD

With the time of the year sorted the next decision was did I want to go anywhere else. Atlas Copco was more than happy to pay for a round the world ticket, I just had to let them know where I wanted to go and for how long. Well, the list is endless. South America could be nice this time of the year: although a little too

out of the way; skiing in Canada: been there, done that; other parts of Europe: far too expensive and not too much fun on your own. I did have lots of friends in South Africa and my brother had just moved to London so that seemed like the best choice. 'Not a problem' was the response from Tiffany in the Atlas Copco Australia office. So the two week scholarship had turned into three weeks in Johannesburg, one week in London and three weeks in Sweden. Not too bad for one application form and an interview.

## 'I SAY BRRR, IT'S COLD OUT THERE'

After a few weeks of holidays (jolling in Johannesburg, sight seeing at Victoria Falls, camping through Botswana, and Australia day in London) and one of the longest flights in the world (Sydney to Johannesburg) I arrived in Sweden for the 'business end' of my seven-week overseas jaunt. I was met at the airport by the driver for the two-hour trip to Örebro (I'd always wanted to be important enough to have someone waiting at the airport with a sign for me). Apparently the snow was late this year (bloody global warming) and normally there can be up to a metre of cover either side of the road. Everything still looked pretty white to me.

## BACKGROUND TO ATLAS COPCO

Atlas Copco is a 'world leading provider of industrial productivity solutions' (Atlas Copco, 2007). With a global reach spanning more than 150 markets the group is split into three major business divisions: Compressor Technique (CT), Construction and Mining Technique (CMT) and Industrial Technique (IT) with 25 900 employees worldwide in 2006. CMT, where the scholarship is focused, contributed 37 per cent of the organisations revenues in 2006 however as the current worldwide construction and mining boom continues to ensure demand for equipment, CMT is a rapidly growing division of the Atlas Copco organisation. The CMT division is based in Örebro, Sweden, with numerous production facilities worldwide. This business group is split into a number of smaller divisions namely: Underground Rock Excavation (URE), Surface Drilling Equipment (SDE), Drilling Solutions, Secoroc, Construction tools, Craelius, and Rocktec each with their own product range and service roles.

## ÖREBRO

After the two hour drive, on the wrong side of the road, with five foot anti-deer fences lining the road and snow capped forests, I arrived at my nice little hotel with a view out to the world headquarters and main production facilities of Atlas Copco Rockdrills AB. I was not to forget what I was here for!

Örebro is a city approximately 200 km west of Stockholm and has a population of around 126 000 people. This is the location of Atlas Copco Rock Drills AB's main production facilities and world headquarters. Atlas Copco employed 1107 people in February of 2006; however, I was told that today the figure is closer to 1500 people with the boom ensuring there is plenty of work for the company. This makes Atlas Copco the largest private employer in town.

After a good nights sleep to try to kick the jetlag (although not sure if a three hour flight and one hour time difference from

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London can constitute jetlag, probably more the numerous English beers the night before) I was ready for my first day 'in the office'. The program was to begin with a presentation by myself on the Australian mining industry. Too easy, they are not going to notice if I make up a few facts on the industry. Wrong. What do you tell a group where the majority have worked in Australia, seen more of the Australian mining industry than you have and whose livelihood is dependent on this industry? *Issues facing the Australian mining industry*: Water, labour shortages, export capabilities, environmental and nuclear energy. No questions, perfect.

The rest of that week was spent getting to know the various products produced in Örebro. Within town is the production facility for the URE with various TMEs, LHDs and RBEs. As can be seen where possible everything is abbreviated and shortened to keep things nice and confusing (URE: Underground Rock Excavation, TME: Tunnelling and Mining Equipment, RBE: Raise Boring Equipment). It was during these production tours that I fell in love. Whilst many people say that love at first sight is not possible. That you've got to get to know them first and get to like their personality. I knew straight away that this was the one for me. Given the reputation of the Swedish women, a warranted reputation, you may think I should be keeping this to myself. However, the new love of my life is in fact the new XE3 rocket boomer. With three superb new BUT45 heavy-duty booms for fast and accurate positioning between holes, three COP3038 hydraulic rock drills offering 50 per cent higher penetration speed compared to other models, a full-colour display RCS (Rig Control System) state of the art drilling system, and an Eagle high reach console, this baby was way out of my league. Designed for large tunnelling in the harder and stable granite rocks throughout Scandinavia it is capable of cross sections up to 206 m<sup>2</sup> in a single pass. Whilst it is unlikely this baby will ever be of any use in Australia, after our brief affair I do hope our paths cross again. I was later told that the rig even comes in a five boom (four drills plus a basket) model which was featured on a Discovery program Mean Machines ... maybe size does matter.

Another day was spent out at the SDE (Surface Drilling Equipment) plant which is just on the outskirts of town. One fact that interested me was that the Atlas Copco surface drill rigs are all fitted with a Caterpillar engine and a Volvo cab which seems like having a BMW car with a Mercedes engine and an Audi cab. However, since either company do not make surface drilling equipment they are not in direct competition in that market which makes this agreement work very well. This facility also has a test area where prototypes and new machinery can be tested. I was fortunate enough to test out one of the small rigs, a ROC DC7C which can be used for drilling holes up to 115 mm in diameter. The drilling was fully automatic and since the area had been extensively drilled (described as a large piece of cheese) and there was a fairly thick cover of snow, the hardest part was finding a piece of solid ground to drill through.

After more presentations on the other services offered by Atlas Copco including aftermarket support and the spare parts distribution centre, which handles around 10 000 parts per week, I was given a day to see the sights of Örebro. Having done the town castle, built in the 13th century, and a few other sights around town, I wandered out of town to the lake which at that time of the year is frozen over. It snowed the whole way out and wandering through the parklands which led to the lake was truly beautiful with the snow coating the trees, making me think why the Swedes complain about winter?

One fact that interested me and shows the international diversity of the company is the nationalities of the various area managers in the company. Instead of having Australians the managers for the Australian region, the Regional Business Manager for Australia is from Serbia, whilst Australians are managers for Africa or Russia. This promotes alternate thinking and assists in creating a globally successful company. This also



FIG 1 - Drilling in snow covered cheese: Ulf Gyllander, the guide for the testing of the Atlas Copco surface drilling rigs.



FIG 2 - A range of surface drill rigs ready for worldwide delivery.

means that a large percentage of the business in Sweden is done in English. One very commendable aspects of the Swedes culture is that if they have someone in the group who does not speak Swedish, they will all change and discuss in English. This effort makes you feel very accepted and as if they want you to be a part of what they are discussing.

### ATLAS COPCO SECOROC AB, FAGERSTA

Having seen Örebro, I had a day at Atlas Copco Secoroc AB in Fagersta around an hours train ride to the north-east of Örebro. Fagersta is an old steel production and mining area with mining starting over 700 years ago and steel production over 2400 years ago. This makes it the perfect location for a group which is heavily dependent on different steel for use in mining consumables. Secoroc manufactures the various rock drilling consumables used in the mining and construction industries including Tophammer, Down-the-hole (DTH), COPROD, Rotary and Raise boring products. The division considers themselves the worldwide market leader in rock drilling tools, supplying not only Atlas Copco equipment but competitor machinery as well. It was great to see the passion some of the managers had towards their product and also the friendly rivalry between the three different drilling techniques (Tophammer, DTH and COPROD) with each having their own pros and cons depending on site conditions.

The factory at Fagersta had all sorts of state of the art gear, with robots machining the drill bits and flames heat treating the various consumables depending on the required properties. The current demand on drilling consumables is placing a lot of pressure on the facilities at Fagersta (although that could be said about all of Atlas Copco's facilities) with a number of new multi-million dollar machines being installed to increase production. One interesting aspect of the production process is that the buttons for each of the drill bits are still inserted by hand using a machine press.

## KIRUNA

Following a brief stopover in Stockholm, where I managed to catch an ice hockey game between Sweden and Russia and witness the creation of a very alcoholic concoction involving half beer, half smuggled in Finnish Vodka, I was off to Kiruna. Kiruna is Sweden's most northern municipality located above the arctic circle approximately an hour and a half flight from Stockholm. With an area of 20 000 km<sup>2</sup>, Kiruna was once listed as the world's largest town by area; however, I believe that title now belongs to Mount Isa.

I was at the airport nice and early to meet Ulrika Holmberg who was to looking after me for the trip and to get a good seat for what should be a very beautiful flight. I checked in using the electronic check-in and although I couldn't read what was going on, I could see that the seat I had been allocated was a window seat. Perfect. Little did I know that it was the very back row of the plane and because of the engine, that row doesn't have a window. So as the pilot announced 'those to the right of the plane can see Sweden's highest mountain', and 'as we land you will be able to see into the old open pit of the LKAB Mine' I was crammed in the back corner with a closed window and the roar of the engine.

Upon landing in Kiruna we were confronted with 'warm' weather and as I would find out later in the weekend -10°C can be considered warm. At the airport there were a couple of packs of huskies waiting to take some of the guests to the ice hotel, however, for us that would have to wait a couple of hours. We headed into town which is right above the LKAB mine, Europe's biggest underground iron ore mine. The town is very nice with ice sculptures throughout because of the recent ice festival.

Once we checked out the Kiruna kyrka, a church which is styled like a huge Sami hut, it was time for our night time dog sledding trip. We were taken out of town to the dog kennels where we were to rug up as the temperature was most likely to get to around -20°C. Hotted up (literally) in our full body ski suits and rabbit skin hats, we were ready to go. The 12 huskies were all strapped onto the sled and we were off. The dogs can go up to around 30 km/h; however, the majority of the time it is slightly slower. It was an amazing experience following these trails in the dark with the driver yelling directions and the majority of the time the dogs getting it right. One highlight was when two reindeer ran onto the track and the dogs took off to try to catch them (the rumps of these two reindeer are the only ones I saw in all of Sweden). We stopped mid-tour for a nice hot tea and sandwich in a traditional Sami hut. Towards the end of the tour we were fortunate to see the faint glow of the northern lights. It looked like a green rainbow; however, at its brightest it can light up the entire sky. The whole trip was a very memorable one and something I am very fortunate to experience.

That night for dinner I had what I would consider my most expensive and possibly exotic meal. It was at a restaurant called Ripan. The starter was a 'Cognac marinated ptarmigan, served with lingonberry jelly, herb snow and a lukewarm compote of onion and Karl-Johan mushroom'. This is a local game bird and was served completely raw with a side of herb snow, which is

exactly as it sounds, a pile of snow with herbs through it. The main was a 'File of reindeer served with dark shiitake mushroom broth, mousse made of grouse, potato cake and black pudding from reindeer and Swedish apple' which was very very rarely cooked reindeer and a pudding made primarily from reindeer blood. Finally the desert was 'Chocolate mousse flavoured with Absolut Pepper and black currant'. Obviously you can put the national vodka into anything. Add two beers onto that and the meal price was well over \$150 making this a very expensive but interesting culinary experience.

Our second day in Kiruna was the business part of the trip visiting the LKAB mine, or factory, depending who you ask. The LKAB underground iron ore mine is the world's largest and most modern underground iron ore mine (Mining Technology web site, 2007). With a goal of producing approximately 20 Mtpa of iron ore product over the next few years, it is certainly an impressive operation. The mine has a visitors centre around 500 m underground which is accessible by a normal bus. This underground centre has a lecture theatre, and history and machinery exhibition all underground which is very impressive. We were fortunate enough to visit one of the Atlas Copco production rigs which is fully automated and operated by a control centre underground. All the LHDs are also automated and remote operated from the seventh level of the surface office block. This means that the majority of the mines workers are sitting in offices drinking coffee and doing it tough. Add onto this a full underground canteen serving hot meals and light beer and a roster of seven-on, seven-off but only eight-hour shifts, and you can see that the socialistic beliefs of the Swedes rules.

Following the tour of the mine and lunch in the underground canteen, we were off to the world famous Ice Hotel, which is around half an hour from Kiruna in a small town called Jukkasjärvi. The hotel is built at the start of winter completely from ice and snow from the Torne River and melts back into the river at the end of winter. With around 80 different rooms including Ice rooms, Ice family rooms, Ice suites and a reception, bar and church it is a very impressive complex. After a brief tour and background on the hotel we were able to view each of the different suites. The hotel has around 16 suites with each of them design by a different artist and a different theme. Some of the detail of the ice sculptures in the rooms is unbelievable. The best would have to have been one titled 'The Club' which has an ice couch and lounge chair. The temperature inside the hotel is around is -5°C which is not too bad considering the temperature outside can be in the -30's. As we were leaving it was -26°C which is when I really felt very uncomfortable in the cold (although the Swedes say there is no such thing as bad weather just bad clothing). For those staying the night they sleep on reindeer skins in a special thermal sleeping bag. The hotel also has a church made completely of ice. In the couple of hours we were at the hotel we saw three weddings complete with reindeer sled and elf driver with all three of them Pommy couples (one of the joys of earning the pound). The highlight of the visit would have to have been a drink at the Absolut Ice Bar. The bar only serves Absolut Vodka drinks in ice glasses, which means you can bite the glass as you drink it. I did try to bring the glass home, but all that remains is a puddle in my bag.

## BACK IN ÖREBRO

After a very early morning flight, it was back to Örebro for visits to the various underground equipment research and development departments. One laboratory they have for research and development was described as the CSI of Atlas Copco. Like many equipment manufacturers, Atlas Copco has a problem with cheaper, pirate parts being used as replacement parts on their equipment. These parts are insuperior and their failure often causes problems for the machinery. In an effort to reduce the use



FIG 3 - A vodka concoction at the Absolut Icebar.

of pirate parts, the company examines any pirate parts they find available to determine the materials these parts are made of and advise the customers the risks and downfalls of using these pirate parts.

### ORICA MINING SERVICES

As part of a side trip, arranged by Atlas Copco, I was fortunate to visit Orica's European Initiation Systems production facilities in Gyttorp, Nora, around 30 minutes drive from Örebro. Up until recently this was a Dyno Nobel plant, however, was renamed as part of the Orica acquisition of Dyno Nobel in May 2006. The plant was originally a gunpowder production facility but now makes the range of Orica's electric and non-electric detonators. It was interesting to see (or not see) that the loading of the explosives into the detonators is all robotic and occurs within a bunker. This is controlled by computers and cameras. Like all areas of the mining and construction industry, the facility can't keep up with production requirements and are installing new machines in an effort to increase production. Although there is an Orica sign on the front gate, the majority of the products are still labelled as Dyno Nobel products with the transition expected to take many years. It was great to see the source of a product which everyone in the industry will have some contact with.

### KVARTORP TEST MINE

Next on the agenda was a visit to the Atlas Copco test mine, which is around 20 minutes out of Örebro. The mine is an old room and pillar limestone mine with half of the mine used as an archive centre for the local government. This facility is used to test the Boomer range of development drill rigs, with the soft rock not competent enough from the Simba production rigs (these are tested in a test mine under the Atlas Copco headquarters in Stockholm). Heading out to Kvarntorp I was quite excited about the possibility of operating one of these rigs. When I saw that they had one of the large three boom rigs (a model down from my lover) I was over the moon. The rig was a little slow to get started and as soon as we tried to run any of the drills the electricians would cut out. After much fiddling around it was determined that the electricians who built it would have to come and have a look. The next rig was a smaller two boom boomer. It was also very slow to get started and the problem was traced back to the electric cable used onsite. Thus another machine not working. Onto machine three, a two boom boomer which had just arrived and was parked on the surface. Someone had to go bring it underground ... 'Jack, do you want to drive the van or the Boomer?' What type of question is that, of course I'll take the new million dollar machine. 'This is the brake, accelerator, just flash your lights if you have any problems' ...

'No worries'. I was off, and I was hooked. Little bit of a slide on the snow at the top of the decline but other than that I was fine. Once underground I parked the rig up so that we could load some drill steels onto it. No problems. 'Now just drive it round to the face'. Not a problem, I'm a pro now. Engine on, park brake off ... Park brake off ... Nothing. System fault and the park brake was stuck on. Three machines, all with factory faults, but they assured me this was not normal with the majority of the rigs coming from the factory needing little or no alterations before being sent to the client. It was also further proof that every effort is made to ensure the quality of the equipment being sent to the customers.

### STOCKHOLM

After a sad goodbye to everyone in Örebro who had looked after me during my stay, I was onto the final leg of my trip with six days in Stockholm. Before I was to hit the tourist sights of Stockholm I was off for a day at another of the Atlas Copco CMT divisions being the Craelius division. Craelius is located around half an hour out of the centre of Stockholm and manufactures a range of products for exploration drilling and ground engineering. As with the majority of the Atlas Copco range, the majority of the rigs are moving to automatic drilling. The ground engineering section was something I knew very little about and was interesting to see the range of applications particularly for use in the construction industry. Large shipping containers are fitted out with the grouting equipment and can be loaded onto the back of trucks for grouting in large tunnels.

The rest of the time in Stockholm I was in tourist mode. Some of the sights I managed to see included the Drottningholm Palace which is one of the many Swedish Royal palaces on the outskirts of town; the National Parliament; Gamla Stan which is the old town; and the Nobel Museum. One of the most notable sights in Stockholm was the Vasa Museum which housed the world's only 17th century ship. Building of the ship was completed in 1628 and it is an impressive 69 m long and capable of carrying a crew of 445 men with 64 cannons. The Vasa set sail from Stockholm and after only a few minutes the ship began to heel and suddenly sank. It is believed that between 30 and 50 people were killed when the ship sank. In 1961 after five years of salvaging, the ship was brought to the surface. It remained preserved because of the fresh water and mud in the harbour. It then took close to another 40 years to rebuild and preserve the ship before a museum was dedicated to it. The beauty and detail of the carvings on the ship are amazing and to think it was built close to 400 years ago is remarkable. A definite must see for anyone in Stockholm!

One of the best things I did whilst in Stockholm was to just wander and take in the city. Whilst travelling on your own in a foreign country can get a bit lonely, it was great to do my own thing and wander away from the tourist sights. It was during these things that I got to see the real side to winter in Sweden: taking the dogs for a run on a frozen river, bringing in cartons of cheap beer after a cruise from Finland or a grandmother cruising down a hill on her sled.

### JUST DO IT!

I feel Sweden and Swedes are very unique and as a student to visit and have not alternate priorities (like getting the best deal for the equipment) makes this a once in a lifetime opportunity. I will admit I have now got a significant bias towards Atlas Copco as a company and I think when I am eventually making some equipment purchasing decisions the memories of this wonderful trip and unique company could definitely cloud my decision. For me, it has also changed my focus from wanting to work in the coal industry, which is pretty standard for anyone from UQ, to working in hard rock and getting some experience on these wonderful machines. For this reason I would encourage anyone one to put in an hours work and fill out the application because the experience and rewards you get out of this scholarship are much better than any of the straight money mining scholarships.

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Copco Way' thereby creating a company '*committed to superior productivity through interaction and innovation*'.

## REFERENCES

- Atlas Copco web site, 2007. Atlas Copco [online]. Available from: <<http://www.atlascopco.com.au>> [Accessed: 1 March 2007].
- Mining Technology web site, 2007. Kiruna Iron Ore Mine, Sweden [online]. Available from: <<http://www.mining-technology.com/projects/kiruna/>> [Accessed: 1 March 2007].