

The 2007 Atlas Copco Scholarship Bonanza

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ABSTRACT

During the later part of 2007 I was lucky enough to visit the Atlas Copco facilities in Sweden, and to see first hand what a large and diverse company Atlas Copco is. The reason this paper calls the Atlas Copco experience a bonanza is that it means a source of great and sudden wealth or luck; a spectacular windfall or a rich mass of ore, as found in mining. I think this aptly describes the scholarship as it has greatly increased my wealth of knowledge of the mining industry. This paper intends to encourage all those eligible to apply for this fantastic scholarship opportunity, and seeks to thank all those involved who made this scholarship the amazing experience that it was.

Atlas Copco produces most of its Swedish products in the town of Örebro, and it was here that I spent most of my time, visiting the Underground Rock Excavation group, the Surface Mining Equipment group and Rocktec. I also travelled around Sweden and was able to visit one of Orica's manufacturing plants, the Secoroc group's manufacturing plant, the Geotechnical Drilling and Exploration group as well as being fortunate enough to visit the LKAB mine in the Arctic Circle in Sweden. The trip was not all information on Atlas Copco products and services however; I was able to go to the Ice Hotel in Jukkasjärvi and drink Absolut Vodka out of ice glasses, go on a reindeer safari (as well as eat them!), sample the fine meat from a moose, drink local schnapps, attend the Atlas Copco Christmas party, wander around the wonderful city of Stockholm and generally immerse myself in the great Swedish culture.

INTRODUCTION

Atlas Copco is one of the leading providers of industrial products in the world. The company started in Sweden over 130 years ago and has grown into one of the most recognisable brands in the world. Each year Atlas Copco, in conjunction with The AusIMM, awards a scholarship to one lucky mining engineering student to give them the opportunity to travel to Sweden (and the rest of the world if you like) to see the Construction and Mining Technique area of Atlas Copco, which is predominantly based in Sweden.

To break with tradition, Don Larkin thought it would be amusing to announce the winner of the 2007 scholarship in front of the 450 AusIMM delegates at the New Leaders' Conference held in Brisbane. After thinking that something strange was going on after everyone else received certificates on stage except me, I was ecstatic to find out I was the scholarship recipient. Though it was a shame that not everyone who was short-listed was able to receive the scholarship (as two of them are my best friends!) I was ready and raring to jet out that second to Sweden and to conquer the world! It was only when the adrenalin stopped pumping that I realised it was only May and I had six months of university to go before I could embark on my trip of world domination.

SO MUCH TO DO AND SO LITTLE TIME!

I decided that it was a no-brainer to attach a little extra travel while overseas and as I had committed to starting work early January 2008 I had 47 days to play with after finishing uni, and I wanted to fit in as many countries as possible. Two weeks would need to be spent with Atlas Copco in Sweden to gain a full understanding of the company, so 32 days, ten other countries – piece of cake!

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WORLD TRAVELS

First I stopped in Dubai, as my cousin is living there and I have always wanted to go. The United Arab Emirate state is an amazing experience, with almost all buildings with a crane atop of them, and the amount of building happening in a city that ten years ago was mostly desert is phenomenal.

Next it was time in England, through London, Rugby and Coventry and through to Scotland visiting Glasgow and Edinburgh. The countryside through these parts is just beautiful, with the history mind blowing when compared to our own. The Imperial War Museum in London, Warwick Castle, Westminster Abbey and Edinburgh Castle were highlights.

In order to see as much of Europe in the short space of time I had I decided to embark on a Contiki tour, despite all reservations I had about group touring. In 14 days the tour fit in eight countries and was a whirlwind experience, with most of the time seemed to be spent on the bus. Coming from Australia I thought that Europe would be a breeze to travel through, but by bus the distances may seem short but there is an endless supply of traffic and 'lorries' around which are not conducive to easy travelling.

Some of the places visited on the Contiki tour included: the canals of Amsterdam, Anne Frank's House, the Rhine Valley, Munich with its Glockenspiel and Beerhalls, Innsbruck with its beautiful Christmas markets overlooked by snow capped peaks. Italy was a highlight with four days spent through Venice with its canals and gondola rides in the rain, Rome with the multitude of things to see including the Pantheon, Colosseum, Roman Forum and Florence with the beautiful Ponte Vecchio, statue of David by Michelangelo and the statuesque Duomo. Switzerland was lovely and quaint with time spent in Lucerne, and a little too much money spent on a gorgeous Tissot Swiss watch! France was amazing with Paris living up to all expectations with highlights being the Opera House, Eiffel Tower, Notre Dame and the Moulin Rouge show.



FIG 1 - The Moulin Rouge!

FINALLY, SWEDEN!

After spending a couple of days in London recovering from the Contiki trip, it was finally off to Sweden. I arrived in Stockholm to the excitement of snow and was met by the driver for the two-hour trip to the town of Örebro.

Örebro

Örebro is a gorgeous town situated about 200 km west of Stockholm. It even has its own castle! This castle was constructed during the stewardship of Birger Jarl during the early 13th century and was then modified and enlarged during the reign of King Gustav Vasa in the 1560s. It is situated in the middle of town – the town of today is built around it. Örebro is also the location of the world headquarters of Atlas Copco, and a main manufacturing point for many of their products in the Underground Rock Excavation (URE) division.

Atlas Copco is divided into different business areas and I was in Sweden to see aspects of the Construction and Mining Technique (CMT) business area. The Construction and Mining Technique business area develops, manufactures and markets rock drilling tools, underground rock drilling rigs for tunnelling and mining applications, surface drilling rigs, loading equipment, exploration drilling equipment and construction tools. It is divided into eight divisions; Underground Rock Excavation, Surface Drilling Equipment, Drilling Solutions, Secoroc, Construction Tools, Geotechnical Drilling and Exploration, Road Construction Equipment and Rocktec (Atlas Copco, 2008).

After arriving, I settled into the little hotel that has a lovely view of the 'hamburger building', which is Atlas Copco's Underground Rock Excavation (URE) administration. The next morning I met with everyone who would be part of the program in Örebro, and was first acquainted to the Swedish tradition of having numerous cups of coffee during the day (I mean, double figures!). I then gave a presentation to everyone on why I was in Sweden, and what I hoped to gain from the experience. Once this was done, nerves were pushed aside and the real learning began!

First on the agenda at URE was the Tunnelling and Mining Equipment (TME) division, with presentations on the boomer series, which are the face drilling rigs, which vary from a one boom rig to a four boom rig with basket! Next was the load haul dump machines (LHD) with special reference to the low profile LHDs that are used in South African mining operations, at only 1.8 m tall. Then it was onto the Minetruck fleet and the new MT6010, which is an underground truck able to carry 60 t – wow! The raise borers were next; these are very interesting custom-built machines, very expensive and much R&D goes into the production of these machines. In the past the average number of raise boring machines produced in the world was five units per year, now Atlas Copco produces 15 units per year, with demand very high for these products. The parts for the raise borer machine are made all over the world, with the basic machine made in Örebro, the drill made in Canada and the reamer head made at the Secoroc facilities in Fagersta.

Once all the presentations had been made it was time for a tour of the production facilities, and what facilities they are! The cleanest most organised production line is one way to describe it. They also have different lines for the trucks, boomers, LHDs and rock drills. The boomers are very advanced pieces of equipment and the technology that Atlas Copco uses for their rig control systems has come a long way. The boomers are able to be fitted with ABC automation systems, which have different levels of automation from hole deviation to total automation, which is something the industry is looking strongly into at the moment, as labour shortages are becoming such a problem (Figure 2).

The next day in Örebro was spent at the surface drilling equipment (SDE) division, which is on the other side of town. Firstly was aftermarket. It is very advanced within SDE, with



FIG 2 - Standing next to one of the new boomers, so yellow and shiny!

COPSEC, COP CARE and ROC CARE. Aftermarket with AC includes guaranteed servicing, written reports, fixed servicing and guaranteed costs with certified AC personnel. COPSEC is a computer system that Atlas Copco utilises in conjunction with their clients to monitor the status of drilling rigs that are set-up within the system. It provides GPS locations of their rigs, total hours, impact hours and is used as a fleet serving manager to map equipment for ease of servicing. Another manufacturing facility tour was done, with the same cleanliness and organisation present as at TME. I was able to have a go on one of the smaller surface rigs and they are a joy to use, so touch sensitive and ergonomically designed for operator comfort.

Other aspects of Atlas Copco such as the distribution centre and Rocktec were also shown to me, and at times the scale of the company with how many parts are going out of the distribution centre every day was mind blowing.

Kvarntorp

Kvarntorp is the test mine that Atlas Copco uses. It is an old room and pillar limestone mine and is only 40 m below the surface, and access to the mine is with any ordinary car. I had the opportunity to test one of the new two-boom boomers in automation mode, which is where you line up the boom with the little dots on the screen (which have already been pre-programmed) and the computer tells you how much deviation from the hole, or how much you need to move the boom up or down, pretty cool!

Kiruna, LKAB and the Ice Hotel

The next day I woke up very excited; it was time to go to the Arctic Circle! Marcus (my chaperone) and I headed back to Arlanda airport and took off for the one and a half hour flight to Kiruna. Flying over the northern landscape the one picture that came to mind was the moon; it was all white with little pockmarks on the otherwise untouched surface, such a breathtaking sight that we in Australia do not have the opportunity to see often, if at all! The LKAB mine is visible from the airport, and pretty much everywhere around town, but that part of the tour could wait, it was time for a reindeer safari!

We arrived at the Ice Hotel in Jukkasjärvi, and got changed into some ski suits for our tour. It was only 3.00 pm but it was already getting dark. Firstly we took a ride on a snowmobile (very fun) to a traditional Sami (the Sami people are an indigenous people of northern Europe) camp. There I tried unsuccessfully to catch a reindeer, which I wasn't very good at, so I stole someone else's caught reindeer and got a photo with it.

The reindeer are very used to tourists trying to 'lasso' them, and therefore stand very still, making you think they are an easy target, but when you throw the lasso they give a quick, practiced flick of their antlers and the lasso falls harmlessly to the ground, they then do a little run and stand there waiting for the next throw. I swear the reindeer was smiling at me as it did this! We then went on reindeer sled rides through the dark forest, so much fun! After all this excitement it was starting to get a little cold (about -15°C), so we went into the Sami tent and sat on reindeer furs while feasting on reindeer (which tastes pretty good!), Sami bread and lingonberry juice. On the way back to the Ice Hotel we were fortunate enough to see the northern lights, just beautiful.

After changing out of our ski gear we went to dinner at the flash hotel that is attached to the Ice Hotel. A five-course degustation menu with tasty food and wine, though the moose main course tasted very 'moosey' and I wasn't quite sure about that! All the courses were served on an ice plate which made the meal all the more exciting.

After dinner we went to the Ice Hotel and saw all the ice suites that people are able to stay in when the hotel is open. They are amazing; each one is designed by a different artist and the bed, chairs, floor, everything is made out of ice! It takes weeks and weeks for some of the suites to be carved as they are so intricate. When you stay at the hotel you sleep on reindeer skins in a special thermal sleeping bag. Looked a little cold to me, so I was glad that we would be going back to sleep in our warm hotel in Kiruna. Before leaving we had a couple of drink at the Absolut ice bar, drinking vodka cocktails out of ice glasses, which you can then throw around and smash outside, so much fun! (Figure 3).



FIG 3 - Having a drink at the Ice Hotel.

The next morning we went to the LKAB mine, the world's largest, most advanced underground iron ore mine. In the past 100 years since it was opened it has produced over 950 Mt of iron ore, and only one third of the original orebody has been extracted (Mining Technology web site, 2008). In 2006 the Kiruna LKAB mine produced 23 Mt of iron ore, an amazing total for an underground mine; it utilises the mining method of sublevel caving. Hence why some people call this mine an underground factory.

The tourist centre is at 540L (540 m below the surface!); to access it you drive down on a paved decline in a standard bus. At the tourist centre there is a hundred seat amphitheatre, café and mobile phone reception! After seeing the tourist part it was time for the VIP tour. We went to the 930L to see a Simba DTH W6C automated rig; it is fully automated from the control centre, even collaring of the hole. It had a Wasser DTH hammer, driven by water which produces very good results, though clean water is a must. Next it was to the 775L where we had a proper canteen hot

lunch; I could get used to this in a mine! It is also on the 775L where the control room is. One operator watches five screens and operates the five Simbas in use at the mine. Cameras watch the rigs and are set up to a wireless network. The Simbas at the mine have been automated for 12 years. As the mine increases in size they are moving the town of Kiruna out of the way of the caved zone. In 30 year's time the town will be standing a few kilometres from its existing site.

Kiruna was one of the most amazing experiences, such a beautiful landscape and something you only ever get to see in the movies, I was very fortunate to be able to visit and it is a memory I will cherish for a long time.

Örebro again

After a late flight out of Kiruna, it was back to Örebro to attend the Atlas Copco marketing Christmas party. It was held at a restaurant where you were put in teams and had to make the evening meal for everyone attending. My group was in charge of the three flavoured truffles for desert. One of them was a chilli flavour and we accidentally (maybe on purpose as we were having a few drinks) added a little extra chilli. After we presented the desert to the room I told everyone that the white truffles were the most delicious and then watched as everyone's eyes started watering from the heat! As the night went on more of the local schnapps came out, and the songs got louder and more vulgar. I stood up and sang one of the Australian drinking songs (here's to ... he/she's true blue ...) with two fellow Aussies that work for Atlas Copco which was a highlight of the night. All in all it was a great night getting to know some lovely Swedish people, and I have many offers to come back and stay if I want.

Orica Mining Services, Gyttorp

After attending the party, my head was a little fuzzy after all the schnapps, but who doesn't perk up when they get a tour of an explosives manufacturing facility! The Orica plant is situated about 45 minutes from Örebro in Gyttorp, Nora. It is here where they manufacture many of their electric and non-electric detonators. There are many processes that go into the manufacture of detonators with pretty much all of them done robotically behind reinforced steel. The robotics of the plant are very technologically advanced with it all controlled by cameras and computers. At lunch time, I was lucky enough to see the Swedish St Lucia tradition which is on 13 December and commemorates St Lucy. In Sweden girls dress up in white robes and sing the St Lucia song while holding candles; it is a very beautiful occasion and it is followed throughout Sweden.

Secoroc, Fagersta

The next stop was Fagersta, where Atlas Copco Secoroc has its headquarters and manufacturing facilities. The Secoroc plant is the number one heat treatment plant in Scandinavia. Friction welding is used to join the different pieces of steel together. At Secoroc they manufacture the different consumables used in mining, such as: tophammer, down-the-hole hammer, COPROD, rotary and raise boring. The Secoroc manufacturing plant uses cutting edge technology, with all sorts of great machines, such as tungsten carbide furnaces and the machining of parts is done so quickly and efficiently.

Stockholm

After finishing in Fagersta, I caught the train to Stockholm (which was interesting with two suitcases in peak hour) and arrived at my lovely hotel in Kungsgatan, near the centre of Stockholm. Into tourist mode I went, as I had the whole weekend to immerse myself in the sights of Stockholm. Stockholm has been the political and economic centre of Sweden since the

13th century; it is full of beautiful old buildings and is a city with so much charm. Saturday dawned bright (and cold, 2°C!) and I decided to go on a boat cruise of the lake area through the locks and canals that surround Stockholm's islands. I also went to Gamla Stan (the old part of town), the Palace, and the Vasa museum. This museum was a highlight of the city; it houses a Swedish warship that sank in 1628 only 30 minutes after it was launched in the harbour. It sat at the bottom of the harbour for 333 years until it was salvaged and brought to the surface where it was restored and put on public display. The intricacy of the carvings and workmanship that is still apparent on the ship today is amazing.

I caught up with one of the people from Fagersta, Marino, who took me to the best Thai restaurant I have ever been to. It is even featured in the Lonely Planet guide! It was there that I ate the hottest curry I have eaten in my life. After that we went on a bit of a sightseeing tour of pubs in Stockholm. I found it to be a very cool city, with loads of culture, I love the fact you walk down all the old cobblestone streets to go into a trendy bar. Stockholm was definitely one of my favourite places to see; it has so much charm and gorgeous architecture you can get happily lost here for days! Alas, all good things must come to an end, so it was with great sadness that I got on the train to Arlanda and home.

WHAT ARE YOU WAITING FOR?

The difference with this scholarship compared to others is that this is an experience scholarship. It shows you aspect of the industry that you never could have dreamed of. After seeing the other side to Atlas Copco products I can definitely say that I am very biased towards them, and hope one day to be purchasing some of their equipment, or even to work for them! They have

lived up to their business motto of '*First in mind, first in choice*'. They were so helpful and friendly towards me and I am so very thankful for the opportunity to be a part of the Atlas Copco experience. The Swedes are such lovely people that I would definitely like to go back at some stage. So if you are ever in the position to be applying for this scholarship, or any other scholarship/opportunity like it, then do it! This experience has also shown me how global the mining industry really is; the opportunities are endless and are there to be taken by anyone who has the drive and loves adventure. So the question is – what are you waiting for?

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A big thank you goes to Atlas Copco for their support of students in the Australian mining industry. This scholarship is one of a kind, and I am so lucky to have been given the opportunity to see what a diverse company Atlas Copco is. Thank you to Tiffany and Sue in the Australian office for organising the logistics of the trip, nothing was ever too hard. Thank you to everyone in Sweden who was involved, especially Annelie who organised everything in Sweden. This experience was one I will always remember, and has put me in good stead for my career in mining.

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