

POLE POSITION

With projects stretching from the North Pole to the South Pole, Leonhard Nilsen & Sønner (LNS) has developed an expertise in tackling difficult projects in logistically challenging locations. Project Director, Mr Frode Nilsen describes some of the demanding tunnelling, road and mining jobs that the Norwegian company has taken on over the past 50 years. Sarah Pursey reports.

Located approximately 300 kilometres north of the Polar Circle, in Vesterålen, north Norway, LNS has become a major operator in the country's construction industry in Norway, and is involved in activities such as tunnelling, mining contracts, road projects, rock support/ grouting and earth-moving – in logistically and climatically challenging locations.

"We are very specialised in the excavation of tunnels, and we have also built up a great deal of expertise in operating under tough working conditions," says Mr Nilsen, whose company's turnover in 2008 was around US\$294 million – approximately 70 percent of which came from underground work.

Over the past few years, LNS has also concentrated its efforts overseas and has experienced considerable success in international initiatives, including projects in Chile and Hong Kong (via joint venture), as well as the Arctic and Antarctica. In recognition of its performance on the international stage, the company received the prestigious Byggeindustrien Special Award in 2008.

Father and son team

Established by his father, Malvin Nilsen, and grandfather, Leonhard Nilsen, the birth of LNS represents a father's desire to keep his son close by his side. "The reason for setting the company up was that my father got a job at a Volvo factory in Sweden and my grandfather felt it a real pity that his son was moving to Sweden," Mr Nilsen tells us. "So they were sitting up one night, discussing whether there was a business they could start together. As a result, they ended up founding the contracting company for building roads and so on – that was in 1961."

The first tunnel project undertaken by Leonhard Nilsen and Sønner was in Steigen in 1986 – "At that time, the project was the longest road tunnel in northern Europe," says Mr Nilsen. "And as you can imagine, not all of our competitors were happy when we entered the market – but we have been in the market since then." Not only has LNS been in the market since then, but over the past few years, it has become the biggest contractor for underground excavation work in Norway. "Today, we are also the only Norwegian contractor that is looking abroad for projects," Mr Nilsen informs.

The company is presently undertaking projects in joint venture with Leighton Asia (one of Asia's leading construction and mining contractors) in Hong Kong, and with Salfa Corp in Chile. "Salfa Corp is one of the biggest contractors in Chile," says Mr Nilsen. "In addition, we have a lot of projects in



Mr Frode Nilsen, Managing Director



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Spitsbergen (a Svalbard island), and we also have a project in Antarctica," he reports. The 850 employee-strong company currently enjoys a turnover of around £200 million, with typically 10-14 percent of this as profit (before tax).

Joint ventures in HK and Chile

In Chile, LNS is charged with developing a rock cavern for CODELCO (Corporación Nacional del Cobre de Chile – or, in English, the National Copper Corporation of Chile) – the Chilean state-owned copper mining company and currently the largest copper-producing company in the world (it produced 1.66 million tonnes of the metal in 2007 – 11 percent of the world total – as well as owning the world's largest known copper reserves and resources).

Aside from this huge project, LNS is keen to further penetrate a market where it expects to see a boom in the future. "Chile will need a lot of tunnels building in the next 10 to 20 years – not only for proposed mining projects, but also for hydropower," advises Mr Nilsen. "As a result, we have established a company in the country called LNS Chile and we are looking for more projects. One such project that we are tendering for the new access tunnels to the new mining level in the copper mine t El Teniente – the final decision for this project will be made at the end of February."

Meanwhile, in Hong Kong, LNS are currently undertaking a large sewage tunnel project. "The tunnel is 7.5 kilometres long and is situated on the Hong Kong island," reports Mr Nilsen. The principal delegating authority for this contract is the Hong Kong Drainage Service Department, and the contract includes a sewage exchange tunnel from Aberdeen to Sai Ying Pun on Hong Kong Island. The project is part of the Hong Kong Government's Harbour Area Treatment Scheme (HATS), a world-class sewage treatment project. In addition to the



7.5 km tunnel, five shafts with lengths from 70 to 120 metres will be constructed. Inside the tunnel, two oval pipes with diameters from 1.38-1.65 metres shall be cast. About 140 000 cubic metres of concrete will be used in total. "Once completed in late 2013, the sewage will be sent over the strait via the tunnel (partly below the sea and running partly below buildings) to the Hong Kong mainland and cleaned up before being sent out to sea," he tells us, of the US\$2.54 billion project (total value).

Projects of prestige

A particular project hotspot for LNS is Spitsbergen – the largest and only permanently populated island of the Svalbard archipelago in Norway. Constituting the western-most bulk of the archipelago, it borders Arctic Ocean, the Norwegian Sea and the Greenland Sea, and covers an area of 39,044 square kilometres, making it the largest island in Norway. "Here, we are providing the services for a regional coal mining company called Store Norske – this activity actually represents approximately 50 percent of our turnover on Spitsbergen," advises Mr Nilsen. "Another customer is the Spitsbergen authorities.

"We were also contractor for the construction of Svalbard Global Seed Vault in Spitsbergen – the world's largest warehouse for the storage of seed," he tells us. Built to conserve seeds from central crops critical for global food safety, the vault is globally unique, and its grand opening in March 2008 drew massive international press attention. "It's now been two years since the facility was opened, and you can see an image of this project every day on CNN," remarks Mr Nilsen.

The remoteness of the region and the presence of permafrost were the reasons for selecting Spitsbergen as the site for the now world famous seed vault. The location is protected from all known scenarios for





a rise in sea levels as a consequence of global climate change, plant disease, nuclear war, pests and natural disasters. The project represented a highly complicated build, due to the challenges of constructing tunnels and rock caverns in permafrost, combined with the complex geological conditions of this location.

"This was, in fact, a very small job for us – only 50 million Norwegian crowns [US\$8.56 million] – but it was nonetheless a very prestigious and important project," explains Mr Nilsen, proudly. "We were excavating one tunnel, at the end of which we built three vaults for the storage of seeds. The idea was to store seeds in the first vault for the first 30 years, in the second vault from 30-100 years from now, and then from 100+ years for the last vault. However, after two years, the first rock cavern is already full of seeds, so they have now started utilising the second vault," he tells us, keen to stress that the importance of the project should not be underestimated. "These are seeds that are coming from all over the world – to the biggest seed storage facility in the world."

Through its experiences operating in cold climates, LNS has secured a prestigious project in the Antarctic – the coldest, most arid and windiest continent on Earth. The project takes place at the research station Troll, which is operated by the Norwegian Polar Institute. "Here, we are currently building up satellite antenna for the Norwegian scientific organisation KSAT [Kongsberg Satellite Service AS]," reports Mr Nilsen. "We have already been in the Antarctic for five years and we intend to be there for a few more. We are presently tendering for a project for an Indian Scientific organisation."

At the moment, LNS is building the new double track in the modernisation of the Vestfold line; one railroad tunnel project in Tönsberg and one in Holmestrand. These are two of four projects in the modernisation of the Vestfold Line; one road tunnel project close to Bodö; also projects at Tromsö and another in Öksfjord. The company is mining con-

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tractor for Elkem in Finnmark, Tana, Skaland, Mo i Rana, and owns both the iron ore mine at Mo i Rana, and the graphite mine at Skaland. It is also the mining contractor for Franzefoss. In the Antarctic, LNS Spitsbergen has been hired to construct satellite antennas for NASA and the ESA, and is going to build the first phase of the third Indian station, Bharati in Antarctic for National Centre for Antarctic and Ocean Research (NCAOR), India.

Quality operations

In terms of its tunnel operations, in particular, LNS uses a very flat organisation structure, which enables the company to operate to a greater level of efficiency than some of its competitors. "Our tunnel workers are very skilled – they are not doing just one thing but many different jobs in the tunnel. With multi-skilled workers, we are able to use fewer people than other companies around the world," Mr Nilsen points out. "One project that I was looking at, for example, had 17 employees working in the tunnel – whereas here in Norway we would use perhaps three or four people on the same tunnel system. Of course, if you look at what each of our employees is being paid per hour, we are paying a lot more. However, if you look at what you are paying per cubic metre for a tunnel project, it actually works out good

value; the reason being that our personnel are very efficient – and that's something we are practising all along the way."

With quality and environmental systems accredited to ISO 9001 and ISO 14001 standards respectively, LNS is now working towards the OHSRS 18001 health and safety standard to complete the set. "We have a great deal of research currently on going in that area, and we have had no accidents in recent years, even throughout all of the often more risky tunnelling projects."

The unavoidably invasive nature of the company's tunnelling work naturally brings up the question of LNS's approach to environmental issues. "When you are operating in areas such as Spitsbergen, you must work carefully with nature," advises Mr Nilsen. "Understandably, this means that there are a great deal of rules and regulations with regards to nearly everything that you are doing there. Environmental regulations in Spitsbergen are therefore much more strict than in Norway, on the mainland. It is actually this approach that we are taking and applying to our operations on the mainland; we are implementing these high standards throughout all of our operations, in fact."

Part of maintaining a high standard of operation across the board is having machinery and equipment that operates to a reliable, efficient and safe standard.

"We mainly use equipment from Scandinavia – our main supplier of tunnelling equipment is AMV from Norway; a rather small supplier but one that is very specialised. As a customer of AMV, you can decide exactly how your equipment will look, so it is very specialised towards the contractor's demands," explains Mr Nilsen. "We mainly use Volvo to supply our articulated haulers, rear loaders and excavators – also Caterpillar and Komatsu. And then, for the tunnelling equipment, it's mainly AMV and Atlas Copco."

Collaborating for the long term

Asked to describe what he feels have been key to the success and expansion of LNS over nearly 50 years since the company's inception to its present position as a specialist contractor of international acclaim, Mr Nilsen explains that the firm's objective, across all different project types, has always been to form long-term partnerships with its clients. "For instance, we have been co-operating with LKAB (the Swedish iron ore company) since 1981, while we've been working with Store Norske since 2000, and Elkem since 2001. These mining companies feel that they can trust us and, as a result, we have enjoyed long-term co-operation and contracts, and have been able to solve a lot of problems on challenging projects for them." □

Indeed, LNS Spitsbergen has been providing logistical services to the Svea mine for client Store Norske since the year 2000. Located 60 kilometres south of Longyearbyen, Spitsbergen, at the end of the Van Mijen Fjord (which is clear of ice only five months out of the year), Svea is a formidable environment in which to operate. There is no road connection to the rest of the Spitsbergen island, and once the fjord freezes over, Svea can only be reached by snowmobiles or small airplanes. In this icy wasteland, LNS has found one of its most challenging projects to date. The primary responsibility has been transporting coal from the mine to the storage facility at Cape Amsterdam, as well as to load coal onto ships. Furthermore, LNS is responsible for transporting machinery and other goods, and constructing anything from roads and quay facilities to housing and offices. The company is also responsible for the fuel supply to Svea, and the contract runs until 2020.

Key to LNS's future strategy will be to take on board the experience garnered from its projects in the Arctic and the Antarctic, and use such skills and expertise around the world. "We are especially interested in utilising our expertise on mining projects in Greenland and Canada," informs Mr Nilsen. "In terms of venturing into the markets in Greenland and Canada, we will firstly establish LNS in Greenland, and our plans for Canada will then follow.

"As mentioned earlier, Chile will be an important geographical area for us in the future," continues Mr Nilsen. "In terms of projects, HK, Chile, Spitsbergen and Chile projects will be keeping us busy until the end of the year, although we will be looking for more projects to keep us busy for the future." With a wealth of experience in dealing with technically difficult projects in some of the most logistically and climatically challenging projects in the world, and how easily obtainable resources become ever more scarce, it's safe to say that the services of Leonhard Nilsen and Sønner will be in demand on the international project circuit in the years ahead. □

