

Meet Sandvik

THE SANDVIK GROUP'S MAGAZINE FOR SHAREHOLDERS AND EMPLOYEES JUNE 2011



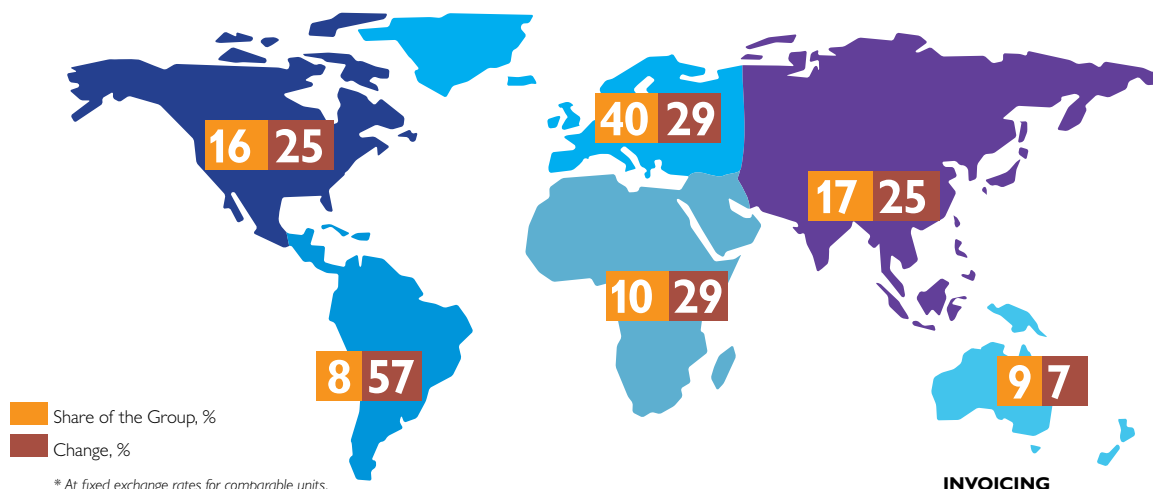
INDIA ON THE MOVE

Meet Olof Faxander, Sandvik's new CEO
Strength in diversity
Salvaged ship gets new lease on life

FIRST QUARTER 2011 IN FIGURES

INVOICING BY MARKET AREA

Share of group invoicing and percentage change compared with year-earlier period.*



INVOICING BY BUSINESS AREA

SEK M	Q 1 2011	Q 1 2010	Change %	Change % ¹⁾
Sandvik Tooling	6,524	5,551	+18	+28
Sandvik Mining and Construction	9,182	7,588	+21	+28
Sandvik Materials Technology	4,598	4,019	+14	+21
Seco Tools ²⁾	1,716	1,367	+26	+34
Group activities	10	9		
Group total	22,030	18,534	+19	+27

OPERATING PROFIT BY BUSINESS AREA

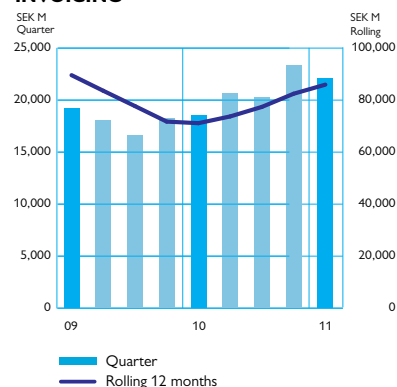
SEK M	Q 1 2011	Q 1 2010	Change %
Sandvik Tooling	1,400	834	+68
Sandvik Mining and Construction	1,327	623	+113
Sandvik Materials Technology	362	312	+16
Seco Tools ²⁾	352	220	+60
Group activities	-170	-92	
Group total³⁾	3,271	1,897	+72

OPERATING MARGIN BY BUSINESS AREA

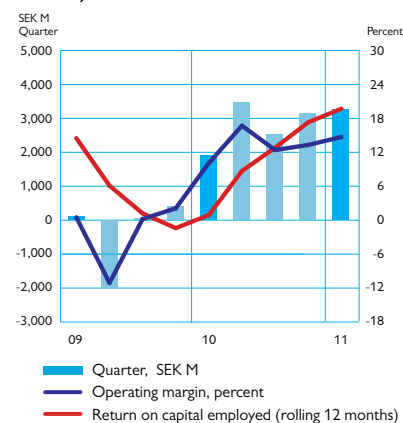
% of invoicing	Q 1 2011	Q 1 2010
Sandvik Tooling	21.5	15.0
Sandvik Mining and Construction	14.5	8.2
Sandvik Materials Technology	7.9	7.8
Seco Tools ²⁾	20.5	16.1
Group total	14.8	10.2

- 1) Change compared with preceding year at fixed exchange rates for comparable units.
 2) As a result of the majority holding in Seco Tools AB, Sandvik consolidates this company.
 3) Internal transactions had a negligible impact on earnings for the business areas.

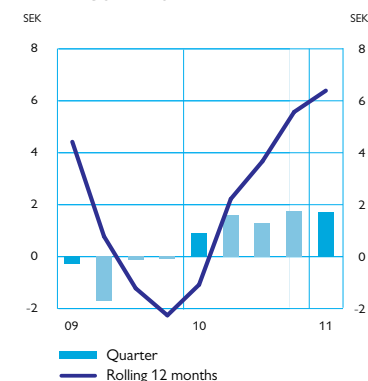
INVOICING



PROFIT, MARGIN AND RETURN



EARNINGS PER SHARE



Meet Sandvik: The Sandvik Group's magazine for shareholders and employees **Editor-in-Chief and responsible under Swedish press law:** Maline Westerberg **Editor:** Jonas Rehnberg **Production:** Spoon Publishing AB **Print:** Sandvikens Tryckeri **Date of print:** June 2011
No. of copies: 115,000. Published in printed form and at www.sandvik.com **Address:** Sandvik AB, Group Staff Communications, SE-811 81 Sandviken, Sweden, info.group@sandvik.com **Cover:** Mumbay Stock Exchange. Photo: Kuni Takahashi/Bloomberg via Getty Images



Demand rises further

I am greatly relieved to say that our colleagues, their families and our units located in Japan all survived unscathed from the disaster that struck the country and its inhabitants during the quarter. The first quarter performance was unaffected. The long-term global consequences of the events that unfolded are still too early to assess.

Overall, the business climate developed favorably during the first quarter and order intake and invoiced sales grew significantly in all business areas compared with the preceding year. Order intake continued to increase in most markets. Demand was strongest in the mining, energy and automotive sectors.

Profitability improves further

The order intake amounted to nearly SEK 25 billion and invoiced sales to slightly more than SEK 22 billion, which were 19% and 27% respectively higher than last year at fixed exchange rates. The operating margin and operating profit improved substantially and amounted to 15% and SEK 3.3

billion, respectively. A higher operating margin resulted in an improved return on capital employed.

Lower levels of project activity and a certain amount of seasonal slowdown in Asia and Australia led to a decline in order intake and invoiced sales compared with the previous quarter.

New faces in management

Group Executive Management has gained two new members: Anna Vikström Persson, Senior Vice President Human Resources and Jonas Gustavsson, President of Sandvik Materials Technology. I am convinced they will both make a significant contribution to Sandvik's continued success with their skills and experience.

Olof Faxander, President and CEO, Sandvik AB



Order intake
SEK 24,901 M, +19%*

Invoicing
SEK 22,030 M, +27%*

Operating result
SEK 3,271 M

Result after financial items
SEK 2,855 M

Result for the period
SEK 2,126 M

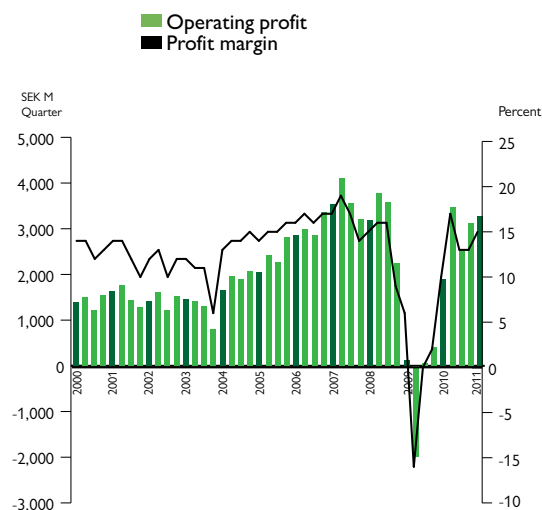
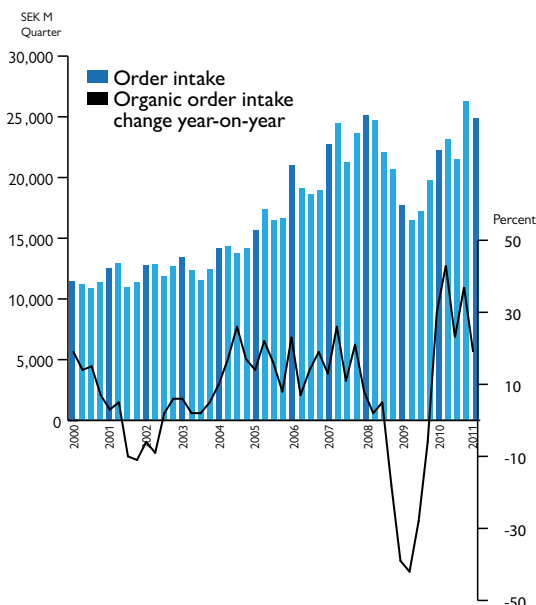
Result per share
1.71 SEK ¹⁾

Cash flow
SEK +1,036 M, -55 %

* Change compared with the corresponding quarter in the preceding year, at fixed exchange rates for comparable units.

¹⁾ Calculated on shareholders' participation in earnings for the period. No dilution effects.

Sandvik Group's financial development Q1 2000 – Q1 2011



Interview with ...

... Olof Faxander, Sandvik's new President and Chief Executive Officer as of February 2011. Prior to Sandvik he held the same position at the Swedish steel corporation, SSAB.

Congratulations on your new job! What made you choose Sandvik?

I saw the vast opportunities this job has to offer. Sandvik is very international and it's a large company with enormous potential.

What experiences do you bring to Sandvik that will serve you well?

I learned a great deal during my five years as president of a listed company. We experienced the strongest boom in SSAB's history and the deepest recession. Being involved in such extreme fluctuations and learning how to adapt is an enlightening experience.

You were named Executive of the Year 2010 by the prominent Swedish business journal, *Affärsvärlden*. How would you describe good leadership?

You have to be able to transform your plans and visions. It's partly a question of surrounding yourself with the right people, but you also have to be very clear about where you are headed. Devoting time to recruitment, development and training employees is time well spent. For employees to grow and develop, they need accurate and straightforward feedback from their immediate supervisors. Obviously, you have to be slightly competitive, you have to want your organization to be the best and you have to do your very best.

You have been a manager since you were 28 and became president of a listed company at the age of 35. The media sometimes describes you as a child prodigy. Can you plan something like that?

If someone had said to me when I graduated from KTH (the Royal Institute of Technology in Stockholm, Sweden) that in ten year's time I would be the president of a listed company, I wouldn't have believed it. It's not a question of planning. I've been lucky to have had good managers who had the conviction to take a chance on me. It is important to have a manager who gives you opportunities and challenges.

Speaking of challenges, what would you say is your greatest



challenge as President of Sandvik? Are you ready to formulate "your" vision?

Not yet. Our strategy for the future is something that we are working through and which will evolve gradually. It's been an intense first few months, with lots of time-consuming travel and visits. It's all part of familiarizing myself with the company.

What can you say so far?

It is vital that we sustain a rapid pace of technical development and that we expand where there is growth. We need to grow in countries like China and India. The acute growth and urbanization taking place in these countries generates enormous opportunities. Our organization also needs to become even more international.

So what will Sandvik look like in say five years?

Not like today. Sandvik obviously needs to change along with the rest of the world. Stand still and your competitors will run you over. I can't tell you exactly what Sandvik will look like five years from now. As I said before, we have to expand

in parts of the world that show growth. We are already big in Europe and North America, but not much of our production is in China or India, for example.

You've worked in the primary industry sector your entire career. What's the appeal?

I studied materials engineering at KTH so it was a natural choice for me. There are sectors where you change jobs all the time, but I think one of Sandvik's strengths is the incredible sense of company loyalty and pride. It was the same at the other companies I've worked for.

What thoughts have you had during your first months at Sandvik?

We are in a fantastic position since we are the world leader in so many product areas. We have excellent technical expertise along with an ability to commercialize technical advances and develop popular products that customers are willing to pay good money for. We also have a strong corporate culture with sound values and I am impressed by the incredible pride our employees, throughout the entire organization, take in working for Sandvik. ■

Innovative interactive campaign

Sandvik's successful "We are in places you would least expect" campaign will be followed by a new, more interactive campaign on the same theme. Launched in Sweden on May 30, the campaign showcases different applications of Sandvik's technology, from razor blades and tunnels to wind power and soft drink cans. The objective is to increase awareness about Sandvik among important target groups, like college students and potential employees.

"We want to make people curious, get people involved and boost awareness about Sandvik," says Maline Westerberg at Sandvik Group Communications.

Like other companies, a substantial portion of Sandvik's workforce will retire in the coming years, so recruitment of new talent is a key issue. The campaign shows that Sandvik is an attractive employer that offers "a career where you least expect it."

Mobile internet and social media come naturally for today's young people which is why the new campaign has interactive features like being able to scan QR codes directly from campaign ads and billboards with smartphones. These codes make it easy to download information about Sandvik.



Vi finns där du minst anar det.

Titta in i Sandviks värld och titta om resor dit du minst anar! Välkommen in på sandvik.se/aha.



Swedish outdoor media advertising says: We're in places you'd least expect.

The campaign also includes a mobile game that lets players learn more about where and how Sandvik's expertise is applied in different environments. ■

New York's underworld growing

Two roadheaders from Sandvik are currently being used to excavate tunnels and rock in New York. When the East Side Access Project is finished, commuter trains will run from Long Island and Queens to historic Grand Central Station in Manhattan East.

The excavation site is beneath Park Avenue, near valuable buildings and adjacent railway lines which is why the Metropolitan Transport Authority and contractor chose Sandvik roadheaders. Greg Hallett, Account Manager at Sandvik Mining and Construction, explains that roadheader technology is becoming more common in North America where explosives and large tunnel drilling machines are typically used.

"Roadheaders offer flexibility in sensitive areas such as Manhattan where the use of explosives is often limited due to adjacent tunnels, underground stations and overhead development," says Hallett.

"We are drilling near landmarks like the Waldorf Astoria Hotel and the Metropolitan Life Building."

Cutter heads with S-Grade cemented carbide picks make Sandvik's roadheaders ideal for dealing with harder types of rock. The Group also supplies service and tooling equipment to the East Side Access Project which, with a USD 7.6 billion budget, is presently one of the largest infrastructure ventures in the US. ■



Sandvik Coromant is number one in the US

The US manufacturing industry is going strong and Sandvik Coromant opened 2011 with a record-breaking quarter. Not long ago, the company secured first place, becoming the largest in its segment. Johan Israelsson, President of Sandvik Coromant in the US, explains why:

"We generate value for our customers by constantly delivering exactly what the customer needs. From the very start, back in the 1950s, we have adopted a disciplined approach. We ranked number four in the market 25 years ago and now we are number one."



Johan Israelsson, President of Sandvik Coromant in the US

The decision to maintain the strategy in 2009 despite the economic recession is another important reason, adds Israelsson. "We continued to work closely with end users when many other suppliers made drastic cutbacks and laid off salespeople and engineers. Our customers could count on us to be onsite as usual."

When Johan Israelsson took over in 2006, he promised every employee a trip to Disney World in Florida if and when Sandvik Coromant managed to achieve first place in the US. In February this year, all 410 employees traveled to Disney World in Florida to celebrate. ■

Sandvik growing in China

Sandvik will acquire 80% of Shanghai Jianshe Luqiao Machinery, a leading manufacturer of crushing and screening equipment for the mining and construction industries. The company, which reported sales of SEK 1 billion in 2010, has 1,200 employees, two production units in Shanghai, and sales and service units in most provinces in China and several other countries.

Sandvik has also signed an agreement with Shangdong Energy Machinery Co. in Xintai to form a joint venture for the production and sale of coal mining equipment. The aim of the joint venture is to become a leading supplier of roadheaders to the Chinese coal market. ■



A global economic superpower

The world's second most populous country is developing at a rapid pace, and all three of Sandvik's business areas are contributing to the transformation.

When Håkan Kingstedt went to India as Sandvik's country manager in 2004, he expected to stay for three years. Nearly seven years later he's still there, but it's a different country.

"There have been extreme changes – it's not the same society," he says from his office at Sandvik's Indian headquarters in Pune.

India is building infrastructure at a dizzying pace: highways, airports, transit systems, power utilities, telecommunications networks. India's carmakers have ramped up production to meet demand from an expanding middle class, and foreign auto companies have raced to set up plants. The increased industrial output has stepped up demand for mining and energy production.

With more than 2,000 employees in India, Sandvik is playing a major role in the nation's transformation from underdeveloped country to global economic powerhouse. Sandvik operates in six major sectors of India's economy: automotive, petrochemicals, energy, mining, construction and general engineering.

"India is growing on average at

around 8 to 9%, and this will continue for the next five years at least," Kingstedt says. "The sectors we operate in have a growth pattern of 18 to 22%. We had a growth rate last year of more than 45%."

Last year Sandvik marked its 50th year in India. The country's first Prime Minister, Jawaharlal Nehru, was responsible for Sandvik's entry into India. Nehru had worked with Mahatma Gandhi to achieve independence for India in 1947.

"Gandhi was a dreamer, with the social ideas to develop the country," Kingstedt says. "Nehru was the industrialist, the practical person. He realized that to grow a country you need industry."

Nehru visited a Sandvik factory in Stockholm in the late 1950s and later traveled to the headquarters in Sandviken. Impressed with what he saw, he invited Sandvik to set up shop in India.

Nehru would be hard pressed to recognize the India of today, where economic growth is second only to China among major nations.

All three of Sandvik's business areas



Håkan Kingstedt,
President of Sandvik Asia

operate there – Sandvik Tooling, Sandvik Materials Technology and Sandvik Mining and Construction. Sandvik India has five factories and four design and development centers, including a Sandvik Materials Technology research and development center in Pune.

"India ranks high in research capabilities from both a competence and a cost point of view," says

Ajay Sambrani, Head of Sandvik Materials Technology in India. "The R&D facility in India is strategically important as it enables the group to work more closely with clients in the Asian market."

FIVE SCIENTISTS CURRENTLY work at the center in modeling, and the number is expected to rise to 15 by next year, according to Sivaprasad Palla, Head of the center.

Simon Meester, Head of Sales and Marketing for Sandvik Mining and Construction in India, says his business area is especially well placed to benefit from India's growth boom, particularly as only



Sandvik in India



Founded: 1960

Sales: USD 465 million (1 April, 2010 - 31 March, 2011)

Number of employees: More than 2,000

Key products: Cemented carbide and high-speed steel tools, crushers, rock drilling tools, mining and construction equipment, and high-temperature materials

Key sectors: Automotive, aerospace, mining and construction, chemicals, oil and gas, pulp and paper, household equipment, electronics, medical devices, and pharmaceuticals

Production and R&D in several locations:

Pune: Cemented carbide and high-speed steel tools, rock drilling tools, assembly of mobile and stationary crushers, rock drills, and more. Also home to Sandvik Materials Technology's research and development center and Sandvik Tooling's Competence Center

Mehsana: Tubing

Hosur: Resistance materials, furnace products

Patancheru: Rotary bits manufacturing .

Chiplun: Powder products, recycling of cemented carbide

Gurgaon, Bangalore, Kolkata and Pune: Design and development of materials handling systems



Ajay Sambrani, Head of Sandvik Materials Technology in India

about 30% of India's 1.2 billion people currently live in cities.

"Urbanization in India is expected to grow dramatically over the next decade," he says. "And for that, the country will need the resources that the mining and

construction industry brings."

Every sector that Sandvik serves has seen unprecedented demand, says Vivek Bhosale, Managing Director of Sandvik-owned Walter Tools India. "The manufacturing sector will grow more than 10%, which means more demand for cutting tools," he says. "While automotive is the main industry now, the other sectors are growing more rapidly, so they assume significant importance for our business growth."

The McKinsey & Company consulting firm recently projected that by 2030 the size of India's economy will have multiplied five times and 590 million people

will live in cities. That's nearly twice the population of the US today.

Meester says the country needs to add another 800 million square meters of commercial and residential space annually – a new Chicago every year. In addition, 7,400 kilometers of metros and subways will need to be constructed, and 2.5 billion square meters of road will have to be paved.

Sandvik supplies equipment to India's construction industry – crushers, drills and various tools and materials handling systems – but mining could provide more business in the years ahead. "The country is very rich in unexplored mineral resources," Meester says.

B.C. RAO, HEAD of Sandvik Mining and Construction Supply Chain India, is optimistic about substantially increasing Sandvik Mining and Construction's presence in equipment and tools. India offers opportunities for sourcing of raw materials and components to support Sandvik Mining and Construction's global requirements. "The regional sourcing office that has been established is to our great advantage," he says.

Gunnar Näsén, Deputy General Man-



B.C. Rao, Head of Sandvik Mining and Construction Supply Chain India

ager Marketing Service at Sandvik Coromant India, sees growing demand for modern metal-cutting productivity tools as well as Sandvik's technological competence.

"There is an increasing need from the market

for complete solutions – that is, products plus technical competence," he says.

The global downturn had only a mild impact on Sandvik's Indian business. Uncertainty about global markets caused business to slow for a couple of months, but the Indian market was unaffected, Håkan Kingstedt says.

Overall, the crisis may have boosted Sandvik's business in India. "After the financial meltdown a lot of new companies came knocking on the door of India, forced by the high cost levels in Europe," Kingstedt says. "Many of these customers coming in from Europe are already well connected with Sandvik." ■

Diversity as a strong

Sandvik's new Senior Vice President Human Resources is convinced that greater diversity is needed to counter the competition in an increasingly globalized market.

"You have to start at the top," says Anna Vikström Persson who, as the only woman on Sandvik's Group Executive Management team, is setting a good example.

SHE IS STILL overwhelmed by all the positive response she has encountered within the Group since becoming Senior Vice President Human Resources of Sandvik on March 1 this year.

"I've received so many encouraging emails. Many people mention the significance of appointing a woman to the Group Executive Management team. At the same time, I'm surprised by the reaction. It's perfectly natural as far as I'm concerned," says 40-year old Vikström Persson.

With a background in leadership positions at both Ericsson and SSAB, she's used to standing out – both as a young woman and as an adoptee from South Korea. Most executive management teams still consist of predominantly middle-aged men.

That was also the case at SSAB when Vikström Persson joined the company in 2006. Five years later, the organization

was considerably more diversified. When it comes to Sandvik's targets, she refuses to name any specific key indicators, saying this is something she will discuss first with Group Executive Management. She is, however, happy to point out a few general principles for succeeding in diversity initiatives: "The appointment of managers is crucial. To ensure good leadership and a dynamic group structure, diversity in the workplace must always be present. Each vacancy must be considered from all different aspects – from experience and education, to age, gender and cultural background."

Vikström Persson points out that this is especially important in a global company like Sandvik, which has operations in 130 countries and almost 50,000 employees. "In growth markets like China and India, it is imperative to have local talent who understand the business culture and can manage operations well."

For a technology-oriented company like Sandvik, recruiting women to executive and leadership positions is especially challenging. "Like all other manufacturing companies, we have to devote ourselves to inspire women to study engineering. In order to attract new talent, and then retain and develop this talent, we must be able to offer the same opportunities and career moves. This is a critical competitive factor," says Vikström Persson. ■



Interview with...

... **Alexandra Kusoffsky, 42, Research Manager at Sandvik Hard Materials in England.**

What can we do to attract more women to Sandvik?

"I think we need to profile ourselves more clearly as being a modern, global company. As research manager, I have recruited ten people, four of whom are women. Maybe it's easier for a female manager to see the qualities in female candidates."

Why is diversity in the workplace necessary?

"Take my department as an example. There are 25 of us, consisting of ten different nationalities, and 35% are women. This mix makes for some interesting discussions and new perspectives that inspire the entire organization to be more aware, attentive and progressive."

You're part of the women's network at Sandvik Tooling. What is its purpose?



"We are 15 managers from different companies and countries. Since December 2010, we have had phone conferences to discuss what can be done to recruit more women.

We make suggestions and serve as a sounding board for Sandvik Tooling's executive management. The issue of recruiting more women risks becoming a non-issue, a paper product, so it's important that we maintain our focus."

How did you end up at Sandvik?

"After taking my doctoral degree in materials science at the Royal Institute of Technology in Stockholm I wanted to work in manufacturing and Sandvik's R&D resources were appealing. Sandvik is recognized as a research company among engineering students in Sweden." ■

driving force

Goal: More female executives

In November 2010, Sandvik Materials Technology started the Diversity Management Program, a new management program aimed at more quickly increasing the number of women who achieve executive positions in different parts of the world.

"This is an attempt to accelerate the trend and make us a more attractive employer," says Peter Lehnbom, Talent Manager at Sandvik Materials Technology.

The two-year program, in which 61 women from 17 countries are participating, is divided into four modules and alternates week-long gatherings at different locations in the world with homework at each woman's workplace.

"We want to use this group as a reference and advisory group to support corporate management. They will be invited to workshops and offer their input on what we need to do to accomplish our goals. Through their homework, the participants serve as advocates of change and the program can thereby contribute to spreading diversity in the workplace to several different levels in the organization," says Lehnbom. ■



Left to right: Lisa Jiang, Susan Mundy, Helene Lindkvist, Julie Edwards, Ulrika Silver and Callie Neo at a workshop in Sandviken, November 2010.



Change in South Africa

Fifteen years ago, black people made up 25% of Sandvik's staff in South Africa — a figure that has increased to 61% today. The change is the result of an intense diversity project, including a trainee program completed by 550 people since 2003.

This year, 180 people will be participating at different levels in the two-year trainee program that alternates theory and practice to turn out qualified technicians in, for example, electronics and mechanics.

"Eighty percent of our trainee program recruits are black, which reflects the general population," says Miles Wakeford, Head of Sustainability at Sandvik Mining and Construction in South Africa.

He explains that joblessness and low education levels are a major problem in South Africa. Wakeford feels that the company's initiative is crucial for Sandvik to secure the competence it needs, but adds that it is also a question of status.

"We run one of the highest ranked training programs in the industry and it makes us more competitive. At the moment, our business area in South Africa is focused on increasing the proportion of blacks and women in executive positions."

A special management program will therefore be launched this year. "Today, about 27% of our middle managers are black. We're aiming for 40%," says Wakeford. ■

System for shorter lead times

Computer-aided process planning (CAPP) is a Sandvik system that salespeople use to customize products according to customer specifications. It is mainly used for special products, but the system can also be used for standardized products. The customer receives a quote directly, and the system generates the documents for production and checks that materials are in stock.

"All the operator in the production unit has to do is download the finished machine program and press the start button," says Per Blomstedt, Manufac-

turing Process Expert at Sandvik Tooling Supply.

CAPP was developed in 1980 in order to shorten lead times for special products. Back then, lead times could stretch up to 12 weeks. Today, the process can be completed in as little as five days. The fact that the system has survived is a tribute to Sandvik's solid IT expertise which goes way back.

CAPP is used for tools from Sandvik Coromant and products from Dormer, Walter and other product areas within Sandvik Tooling, as well as for products from Sandvik Materials Technology. ■

Team in Japan saved the factory

On a Friday afternoon in March, Japan experienced the most catastrophic earthquake ever recorded. At Sandvik's factory in Semine, which makes cemented-carbide tools, machinery and equipment started shaking but the 5S preventive measures kept both employees and equipment safe and unharmed. While all other industries in the region were sifting through debris, the factory started production at half capacity within one week of the disaster.

The 5S process is aimed at creating a factory environment that adheres to the "a place for everything and everything in its place" principle. This means that equipment and material are secured against falls to avoid personal injuries and property damage in the event of an earthquake, and that evacuation routes are kept unobstructed and are clearly marked.

"The 5S miracle team and their co-workers saved the factory from disaster," says Factory Manager Kanji Suzuki.

5S stands for the Japanese words seiri, seiton, seiso, seiketu and shitsuke – or, in English, sort, set (in place), shine, standardize and sustain. The process, which started in 2000, halved production lead times in one year and generated 30% cost savings over a three-year period ■



Semine's 5S team, left to right: Ken Shiratori, Keiji Horigome, Katsuhiko Kato, Keiko Iizuka, Tetsuya Murakami, Osamu Iwabuchi and Masahiro Itoh.



Optimistic AGM

IT WAS A carefully optimistic Olof Faxander who greeted shareholders for the first time at Sandvik's Annual General Meeting. He described 2010 as a year of recovery and ascertained that order intake is on par with pre-crisis levels. Demand is primarily being driven by strong growth in China.

"The positive trend we saw in 2010 has spilled over into the first quarter of 2011," said Faxander. "The strong urbanization we see in China in particular, and which is becoming noticeable in India, is cause for optimism as we look ahead at opportunities for our markets to remain strong."

The International Monetary Fund recently predicted that China would assume the US's position as the world's largest economy within five years. Faxander commented that Asia will become the sole driving engine of the global economy and he underscored the need to expand there. Eventually, as much as one-third of Sandvik's employees and sales will be in Asia. Continuing to focus on research and development is equally important.

"We must continue to invest heavily in research and make sure that we have many minds focusing on developing our products for the future," he said.

Faxander, who took over as President in February, closed with a list of challenges that he has defined during his first months at Sandvik. These are to do with

setting challenging goals and achieving them, having a sound position in places that are growing, investing in diversity in management and internationalizing the organization, while maintaining momentum and driving changes.

TO HIGHLIGHT PRODUCT development, Sandvik annually presents the Wilhelm Haglund Award to the year's product developer. This year, the award went to Mats Ahlgren and Susanne Norgren at Sandvik Tooling, while their colleague Marianne Collin received an honorable mention. Their work to develop cemented carbides based on submicron substrates with PVD coatings resulted in thirteen new types of cemented carbides and combined sales of more than EUR 100 million in three years. The application is used to manufacture cutters and exemplifies a good combination of cutting-edge expertise and good business, said Ahlgren.

The AGM voted unanimously in favor of dividends at SEK 3 per share for 2010, an increase of SEK 1 compared with last year. Johan Karlström, CEO of Skanska and Olof Faxander were elected members of the Board. Georg Ernrooth and former president Lars Pettersson resigned their positions on the Board and were thanked for their services in connection with the meeting. The other sitting members of the Board were re-elected. ■

Sandvik saves warship

Man-of-war *Vasa* was salvaged after 333 years at the bottom of the sea. Now, after 50 years on land, the task of replacing the 5,000 bolts used to keep the ship together begins.

WHEN VASA WAS built, it was considered the most advanced ship of its time, lavishly decorated and fast. But, on Sunday 10 August, 1628, after a journey of only 1,300 meters, she sank to the bottom outside Beckholmen in Stockholm, where she remained at a depth of 32 meters for 333 years.

The years have taken their toll. Among other things, all 8,000 rivets that kept the ship together have corroded and the divers who prepared *Vasa* for salvage had to use new bolt joints to keep her together. These however started corroding when she was on land – partly because they were made of iron and partly due to the conservation agent that she was sprayed with to survive life above water.

“I want to preserve *Vasa* for at least another 100 years,” says Magnus Olofsson, Head of the *Vasa* Unit at the *Vasa* Museum in Stockholm. “But to do so we had to find a material that could be used in the bolts which wouldn’t harm the oak and would last a long time.”

OLOFSSON AND HIS colleagues cased the market and assigned the challenge of developing the right material for the new bolts to Sandvik Materials Technology.

“Before deciding on Sandvik’s solution, we looked at a series of different materials, including carbon fiber, titanium and stainless steel. We tested them chemically, mechanically and for durability. Because we want the bolts to last at least 100 years, stainless steel is the best option,” he explains.

Numerous tests later, Sandvik Materials Technology concluded that SAF 2707HD, a super-duplex stainless material, was the best option. Sandvik’s co-



operation with the *Vasa* Museum means that Sandvik supplies the material. “It is inspiring to be part of such an important project. We can now monitor how our bolts react over the next one hundred years,” says Jan Haraldsson, Head of Cutting Processing Research at Sandvik Materials Technology.

THE TASK OF replacing the 5,000 bolts will start after the summer of 2011 and be carried out while people visit the museum. Olofsson estimates that they will replace an average of ten bolts a day. The work, expected to take about six years, will stop briefly once 1,000 bolts are in place to assess the results.

“Each bolt is unique and has to be modified for each hole. This will take a while since it is a question of 5,000 bolts, but it is worth the effort. Because we

have visitors in the building, we have to work quietly, so we invented a hydraulic claw to extract the old bolts,” he says.

The new bolts are even more lightweight than the old ones. In total, *Vasa*’s weight will drop between 7 and 9 tons, which will contribute to prolonging *Vasa*’s life expectancy above water. ■

Why *Vasa* sank

Vasa was rigged and ready for sea below the Tre Kronor royal palace in Stockholm on Sunday 10 August, 1628. *Vasa* was warped along the waterfront with cables from the shore for the first hundred meters and she began to sail when she reached what is today Slussen. When *Vasa* came out from under the lee, her sails caught the wind but the ship was unsteady and heeled over to port. Water poured through the open gunports and the tragedy occurred. *Vasa* sank after sailing barely 1,300 meters.

The underwater part of the hull was too small and the ballast insufficient in relation to the rig and cannon which caused *Vasa*’s instability. After the *Vasa* debacle, many successful ships were built with two or three gundecks.



Top: The new bolt joint designed by *Vasa* Museum and Sandvik.

Below: The bolt joint that was assembled after salvage and which is now being replaced.



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