TÜV NORD GROUP

Excellence for your Business

ANNUAL REPORT
2015

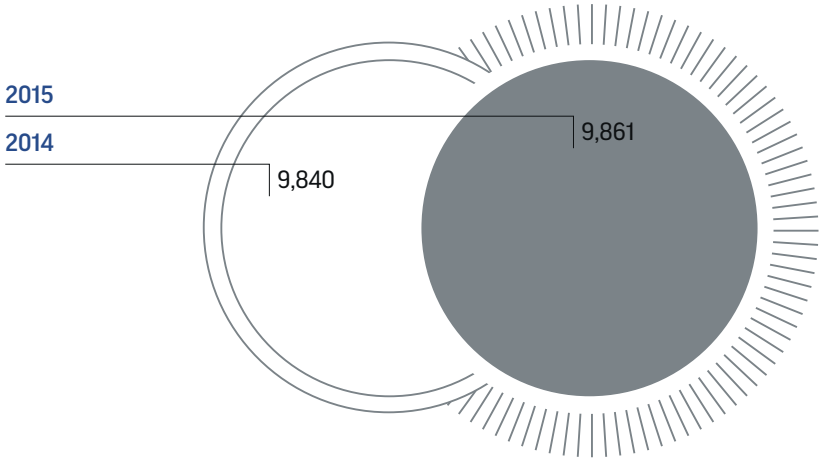
THE DIGITAL TRANSFORMATION FROM TODAY TO TOMORROW

TÜV NORD GROUP AT A GLANCE

KEY FIGURES

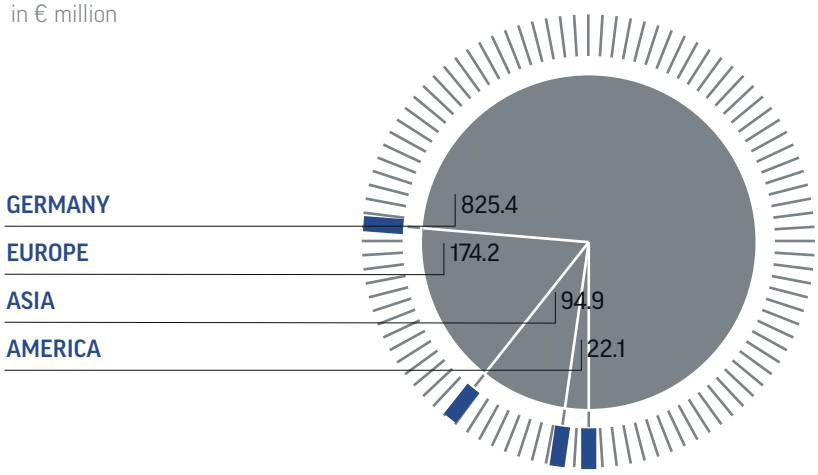
	2015	2014
	€ million	€ million
REVENUE	1,116.6	1,089.5
EBDIT (before non-operating items)	96.0	89.5
EBIT (before non-operating items)	62.3	58.8
EBT	54.8	49.2
EAT	33.9	29.4
TOTAL ASSETS	851.9	776.6
SHAREHOLDERS' EQUITY	101.0	100.8
NET FINANCIAL POSITION	32.3	18.2
PENSION PROVISIONS	424.7	358.2

EMPLOYEES



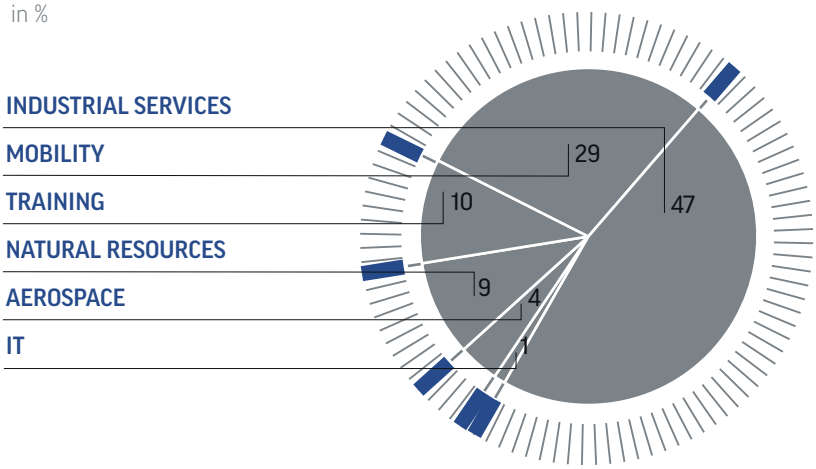
REVENUE BY REGION

in € million

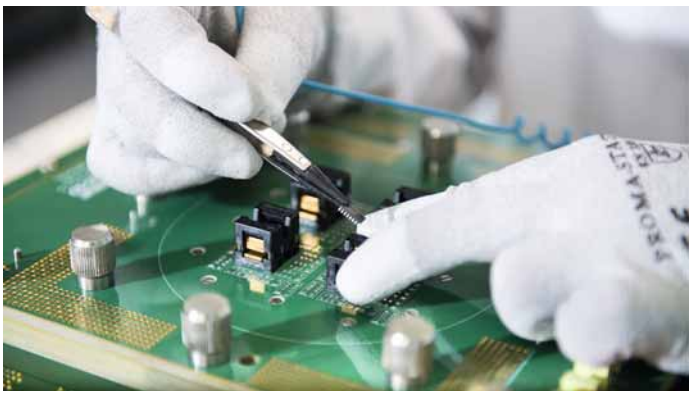


REVENUE BY BUSINESS UNIT

in %



CONTENTS



LETTER FROM THE CEO

Dr Guido Rettig
Chairman of the Board of Management of the TÜV NORD GROUP

Ladies and Gentlemen, Clients and Partners,

We can look back on a successful and eventful year in 2015. Revenues reached a new peak, rising to € 1,116.6 million. This represents a year-on-year growth of 2.5 percent. The operating result (EBIT) rose to € 62.3 million (2014: € 58.8 million). The return on sales, based on EBIT, amounted to 5.6% (2014: 5.4%).

Last year, when all is said and done, our Group continued the trend of positive development and achieved a good result. This was in no small part due to the companies abroad. Thanks to favourable business developments in Europe and Asia, particularly in India, international sales increased at an above-average rate. Around the world we put into practice initiatives for the further development of customer-oriented services. To name just one example: In the Indonesian capital Jakarta, the relocated TÜV NORD food laboratory was extended both spatially and in terms of the technology deployed in order to counteract health hazards.

Despite a weak global economy, our expectations for growth and profitability were as a whole fulfilled. And yet, due to external influences, it proved impossible to meet all our objectives. Persistently low commodity prices in 2015 led to a further global decline in willingness to invest, for example in the modernisation of power plants. Our Natural Resources business unit responded by restructuring its business. The DMT NEW programme is having the effect of reducing dependence on the commodity markets; moreover, areas such as construction and infrastructure, along with systems and process engineering, are seeing

renewed development. New services are increasingly being developed in the research environment of the European Union.

The above-mentioned figures show that our Group is generally on a solid footing. We are in a position to invest in the future. Last year, we allocated a sum of € 43.8 million for this. The money was used, among other things, to expand laboratories, and digital testing technology was introduced, for example, for the inspection of vehicles. Investment in the digitalisation of our services has been earmarked in the financial plans for the next few years.

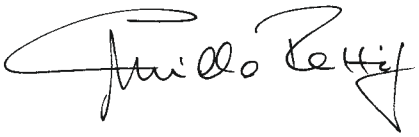
In an increasingly technology-dominated and networked world, the need for security and trust will continue to grow apace. This development offers great opportunities for the TÜV NORD GROUP. Collaborations with companies, universities and other research institutions form an important pillar of our strategy 2020plus. In 2015, for instance, we joined forces with the Fraunhofer Gesellschaft to devise a number of joint projects in sectors including industry, mobility and education. As a founder member of the Industrial Data Space association we are committed to the success of Industry 4.0: the fast, secure and confident handling and exchange of data. This will depend to a crucial extent on significantly higher transmission speeds on the Internet, the definition of uniform interfaces for integration in the Cloud and an effective data protection regime.

The Internet of Things will increasingly affect our personal lives, with particular reference to the economy, in the coming years. Digital networking is transforming our home life and medical care and, above all, production, systems, logistics and transport. The TÜV NORD GROUP has been active in all these fields for many years. And we are determined to grasp the opportunities that are arising. All the business units are working hard on the digitalisation of their services and the further development of business models. This is a further reason why 2015 was one of the most exciting years in our history. The reports and essays in this annual report offer an insight into this new era which is dawning for our company and industry as a whole.

Every day, hundreds of thousands of people worldwide benefit from our services. They trust us to test their vehicles and systems for safety, to carry out measurements in accordance with the relevant statutory regulations and, in doing so, to be meticulous in our compliance with threshold values. They expect us to offer the right training programmes to advance the individual prospects of their staff or to enhance the competitiveness of their companies. We will, as always, justify this trust by offering services of the utmost quality.

In the name of the entire Board of Management I wish to thank all our customers and partners for the confidence they have shown in us. I would also like to thank our staff for their performance and outstanding dedication in the year under review. Finally, my thanks go out to the Supervisory Board of TÜV NORD AG and all the staff councils for their good cooperation.

Sincerely,



Dr Guido Rettig

WELCOME

to all our readers.

The digital transformation of the economy and society is in full swing. Whatever the context – the increasing flexibility of industrial manufacturing, the intelligent networking of electricity generators and consumers, growing online retail – information technology has become the key to economic success in all industrial sectors.

Digitalisation can on the one hand pave the way to new opportunities for growth – as long as the companies concerned are willing to reconsider and further develop existing business models. On the other, the processing, transmission and storage of data is giving rise to new challenges. The TÜV NORD GROUP is responding with consistency of approach to all of the above. With the introduction of a new IT infrastructure, all business processes will in future be digitally mapped with full global transparency: The benefits of this will be felt by our staff – and, in particular, our customers.

When it comes to the digital networking of industrial processes in the context of Industry 4.0, the importance of IT security is self-evident. It is consequently becoming an increasingly important element in our testing activities. This also explains our interest in

Harald Reutter M. A.
Labour Director,
Training business unit

Dr Dirk Stenkamp
Industrial Services and
IT business units

Dr Guido Rettig
Chairman and CEO;
Natural Resources and
Aerospace business units

Jürgen Himmelsbach
CFO

Dr Klaus Kleinherbers
Mobility business unit

reinforcing the expertise of young scientists in the field of IT security for Industry 4.0. It is for this reason that TÜViT is sponsoring a young researcher with a focus on "industrial cybersecurity".

The corresponding post was created at the "Digital Society Institute" of the Berlin-based European School of Management and Technology (ESMT). Its research topics include the analysis of attack scenarios for networked industrial plants and the development of a methodology for assessing existing approaches to security. This pioneering project is being supported by TÜV Hannover/Sachsen-Anhalt e. V.

What IT security means in practical terms for day-to-day business, why we need reliable testing and approval procedures for automated vehicles and vehicle systems and how the specialists from the TÜV NORD GROUP are advising companies seeking to develop a comprehensive IT security strategy are all issues featured in this annual report.

It also offers a number of insights into the varied work of our experts who offer the benefit of their expertise for safe energy, mobility, products and processes in various fields and sectors. ◄

REPORT OF THE SUPERVISORY BOARD

Dr Georg Schöning
Chairman of the
Supervisory Board

In the year under review, as before, the Supervisory Board continued at all times and with great care to exercise the monitoring and consultancy responsibilities incumbent on it in accordance with the law, the articles of association and the regulations. The regular meetings took place on March 24, May 19, September 8 and December 8 2015. The principal focus of the meetings was on business development, the status of strategic planning, and the risk and opportunities management of the TÜV NORD Group. At the meeting of May 19, the strategic development of the Group was discussed on the basis of a comprehensive report prepared by the Board of Management. At the meeting of September 8, the Supervisory Board turned its attention to the law on the equal participation of women and men in management positions and the implementation thereof in the TÜV NORD Group and adopted targets for the Supervisory Board and Board of Management of TÜV NORD AG. In addition, in the meeting of December 8, the budget for 2016 was discussed and approved.

The Supervisory Board received regular, prompt and comprehensive reports by word of mouth and in writing of all relevant issues of business development as well as the situation and strategy of the company, including the Group's main companies, the risk situation, and risk and opportunity management. The Chairmen of the Supervisory Board and the Board of Management were also in regular contact between the plenary and committee meetings, and both kept abreast of major developments. In order to carry out its tasks and prepare its deliberations and decisions, the Supervisory Board set up two committees which effectively support the work of the plenum.

Six sessions of the executive committee / personnel committee took place in the year under review. The discussions focused primarily on the preparation of the

plenary sessions and of the personnel and compensation decisions to be made by the Supervisory Board.

In the year under review the Finance Committee met three times in advance of the Supervisory Board meetings and paid particular attention to the annual financial statement, earnings trends, alongside planning and cost trends with regard to the Group's pension commitments.

The drafting of TÜV NORD AG's annual financial statements and consolidated financial statements, including the associated reports on the situation of the company and the Group, was completed by the Board by December 31 2015. They were validated by the auditors appointed by the Annual General Meeting, BDO AG, Wirtschaftsprüfungsgesellschaft in Essen. The auditors approved the accounts without reservation or objection.

On April 8 2016 the Finance Committee met with the Board of Management and the auditors to discuss the annual and consolidated financial statements and the audit reports. In addition, a detailed discussion took place at the meeting of the Supervisory Board on April 12 2016. The auditors were present at the deliberations on the annual and consolidated financial statements. They reported on the main results of the audits and made themselves available to the Supervisory Board should the latter require additional information. The auditors also noted that the Board of Management had established an appropriate information and monitoring system whose design and management rendered it suitable for anticipating developments that might pose a risk to the continued existence of the company.

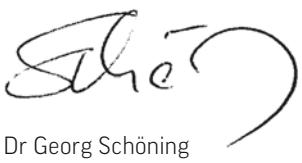
On the basis of its own audit of the annual and consolidated financial statements and the management reports and on the basis of the report and the recommendation of the Finance Committee, the Supervisory Board felt able to concur with the auditors' conclusions. No objections were raised. The Supervisory Board has approved both the financial statements and the consolidated financial statements. The annual financial statements are thus adopted.

With effect from May 31 2015, Ms Brigitte Sparfeld-Möbus retired from the Supervisory Board as an employee representative. The District Court of Hanover appointed Ms Barbara Schipp to the Supervisory Board as her successor with effect from June 1 2015. We thanked Ms Sparfeld-Möbus for her good collaboration over many years and her constructive support of the company and the Board of Management.

With effect from September 1 2015, Mr Jürgen Himmelsbach was appointed successor to the Chief Financial Officer Dr Elmar Legge, who retired at this time. The Supervisory Board thanks Dr Legge for his many years of successful work as CFO at TÜV NORD AG and its predecessor companies.

The Supervisory Board would like to thank all the employees worldwide, the company's managers, the Board of Management and the employee representatives for their dedicated and successful work in 2015.

The Supervisory Board

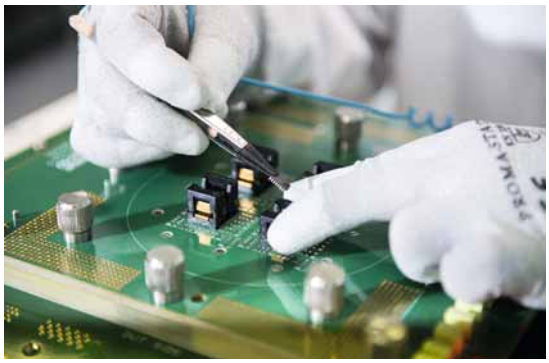


Dr Georg Schöning
Chairman

Hanover, April 2016

Digitalisation has now filtered through to virtually every part of economic and working life. It is helping to make processes in production and manufacturing not just more efficient but also safer. Whatever the field – be it industrial plants, amusement parks, photovoltaic systems or control equipment for aircraft engines – the innovative solutions and expertise of the specialists from the TÜV NORD GROUP are demand throughout the world.

DIGITAL TRANSFOR-MATION TODAY



The progressive digitalisation of various areas of life is giving rise to new challenges and issues which urgently need to be addressed. For everything from data and system security in Industry 4.0 and the requirements for quick claims management in the automotive sector to the networked safety inspection of elevators, the TÜV NORD GROUP is developing solutions for the future.

DIGITAL TRANSFOR-MATION TOMORROW

EFFICIENT MONITORING

Large industrial plants should run for many years, safely and free of defects. Operational breakdowns are expensive and potentially even dangerous. Condition monitoring systems (CMS) from DMT can prevent outages and reduce costs.

Anyone approaching the PCK Raffinerie in Schwedt in the Uckermark late at night is treated to an impressive panorama. A network of tubes and pumps, boilers, chimneys and columns, whose function is totally impenetrable to the layman, extends over several square kilometres and is surrounded by fields. In countless places the refinery is illuminated by thousands of spotlights, offering a fascinating sight. Alone the gigantic dimensions of the plant are impressive. Here the principal fuel of the industrial age – crude oil – is processed. 24 hours a day, all year round. Every year, processing products without which life as we know it would be impossible, such as petrol, diesel, fuel oils, LPG, bitumen and various other substances, are made here from some twelve million tonnes of crude oil. This makes the PCK Raffinerie one of the largest crude oil processing sites in Germany. The smooth running of refineries like the PCK in Schwedt is one of the most crucial conditions for the functioning of other industries, which would be completely crippled without refinery products – as would the vehicles we require for mobility.

Without fuel, everything on roads and rails and at airports would grind to a halt. Given the huge size of this industrial plant, the question arises as to how on earth the system and its parts are supposed to be monitored. How can this seemingly impenetrable thicket of plant be monitored; how can damage ►

IN THE AIR AND UNDERGROUND

Mining: With its condition monitoring system, DMT is making a contribution to the economic processes and procedures of operators of mining machinery. The measuring system proves its worth on machines working under the harsh ambient conditions of the coal face just as effectively as it does with the bottleneck systems in the infrastructure of a mine. These include in particular the conveyor belt systems on which the products of, in most cases, a number of operating points are transported.

Wind energy: Thanks to the condition monitoring system, the operators of wind farms always have an overview of the condition of their plants. They can schedule required repairs several months in advance. This contributes directly to the profitability of investments, as expensive consequential damages and unscheduled downtime are reducible to a minimum.

> "With our early-warning damage detection system we can receive signals in good time that indicate future problems."
>
> Michael Wölfle, Head of the Machine Diagnosis field at DMT

Approximately one in every ten lines of structural components in a refinery is monitored using a condition monitoring system.

The feed pump unit in the industrial power plant of the PCK Raffinerie is under constant surveillance.

► be discovered in time and fixed? One important part of the refinery is the thousands of pumps that move the crude oil and its products over many kilometres. It only takes one to fail for problems to start. And yet, there is good news: The impending failure of a pump usually announces itself some way in advance; what is required, however, is the ability to interpret the signs properly. And this is exactly where DMT comes into play.

> "As a modern refinery, PCK uses the DMT monitoring system to ensure high levels of availability of its machines and structural components."
> Frank Stargardt, Section Head of Maintenance, Contractor Supervision and Services at PCK

"Most damage generally occurs gradually over time," explains Michael Wölfle, Head of the Machine Diagnosis field at DMT. "But if structural components fail all of a sudden, this can be very time-consuming and costly, especially when you don't know exactly what has caused the failure. With our early damage detection system we can receive signals that indicate future problems well before the failure actually happens." The procedure is known as "condition-oriented maintenance." What is used here is a condition monitoring system (CMS) with which the monitoring of plants can largely be automated. DMT offers its customers complete solutions; the company supplies special measurement hardware and modern database and web-based software; it also offers installation and commissioning, including engineering, consultancy work and the training of employees. At PCK, DMT supplied the necessary instrumentation and trained the technicians on site. They can now monitor the entire system themselves. "As a modern refinery, PCK ensures the high availability of its machines and structural components with the aid of the DMT monitoring system. The early warning system is appreciated for its reliability and ease of use," explains Frank Stargardt, section head of Maintenance, Contractor Supervision and Services at PCK. Smaller companies for which the cost of carrying out their own monitoring would be prohibitive can use the DMT control centre in Essen.

STRUCTURE-BORNE SOUND MEASUREMENTS

But how does the condition monitoring system work in a refinery like PCK, for instance? First of all, agreement must be reached with the customer on the exact monitoring needs. "In a refinery this represents about ten percent of the structural components," says Wölfle. The next step involves determining where and

Structure-borne-sound sensors measure the functioning of the structural units in the harsh refinery environment and transmit the data to the server.

The Wi-Fi detection unit from DMT in the refinery is inspected by Dr Thomas Leyh (left) and Matthias Harms.

PCK employee Matthias Harms always knows the exact state of the machines in the monitored systems.

how many of the measuring instruments are to be used. These instruments are known as structure-borne sound sensors. The values measured are transmitted via cables to the server on which the plant data and the evaluation software are located. If the data deviate from the defined target data, the software raises the alarm. Then the operators can immediately find a remedy without causing an unscheduled outage.

EVERY YEAR SEES NEW REFINERIES WITH CMS

"Of course there's no way of completely avoiding a shutdown, even with condition monitoring. Audits have to take place – it's the law. However, the operator can schedule the closure of either a single range of components or the entire plant," says Wölfle. "The advantages are obvious: lower maintenance costs, smooth operation and high levels of plant availability. This saves both time and money." Word of the system's success at PCK has spread. "We've equipped two more refineries in Germany with several CMS." Another important field of application is in mines. DMT has for instance equipped coal mines from Australia to the United States with condition monitoring systems. And the DMT hardware and software is used also in wind farms. With an operating temperature range of -40° to +65° C, the hardware can be used in harsh environments. ◄

TWO DECADES OF EXPERIENCE

DMT has over 20 years of experience in the development and application of condition monitoring systems. These are used in large-scale applications with thousands of monitored structural components. Typical industries include petrochemicals, power plants and metal production (PlantSafe), mining (MineSafe), petroleum and natural gas (RigSafe), and wind power (WindSafe).

The expense of the condition monitoring system is justified wherever equipment is very expensive, difficult to reach or relevant to production: that is to say, where the failure of one small component can bring an entire production facility to a standstill. This is the case, for instance, with conveyor belts in mines, which, if they were to break down, would bring the entire production to a grinding halt.

Another new product from DMT is the new, modular XSafe system which is highly versatile and adaptable. If, however, an application-specific method is required, DMT will develop a fitting solution and adapt the hard- and software to the environment in question. This applies also to deployments in areas where the conditions are harsh or there is a risk of explosion.

SAFE AMUSEMENT PARKS THANKS TO RISK ANALYSIS

In theme and amusement parks, visitors can experience thrills, be spirited away into magical worlds and leave everyday life behind them. In Germany, the Netherlands and many other countries, it is TÜV NORD which looks after their safety.

Amusement parks are popular destinations across the world. Families with children in particular appreciate the many attractions on offer for old and young alike. But if roller coasters, roundabouts and the like are to be fun, they have to be safe.

As the "higher, faster, further" motto also applies to amusement parks, it is essential that park operators regularly service their rides and identify and reliably eliminate the risks. After all, an accident can hit them where it hurts, destroy their reputation for years on end and deprive them of their livelihoods – not to mention the tragic consequences for the victims. The EU requires all operators to perform regular safety checks but does not define the intervals at which they are to be carried out.

MAINTENANCE ALONE IS NOT SUFFICIENT

"In general it's safe to assume that parks check their rides annually and service them regularly," says Kees Bakker, who, as Senior Inspection Engineer at TÜV

"Troy", the large wooden roller coaster, is one of the main attractions of the Dutch amusement park Toverland.

HOW THE SOFTWARE-SUPPORTED RISK ANALYSIS WORKS

The TÜV Nederland software provides a multi-dimensional analysis of all the components of all rides – from roller coaster to merry-go-round. To this end the testing engineer defines the different risk areas for each individual ride. With a roller coaster these might, for instance, be the cars themselves, brake sections, evacuation platforms or passenger restraint.

In the second stage the engineer determines every potential risk for each subsystem in every phase of its life cycle. Then, in close cooperation with the technicians and operators of the park, the possible risks are identified – for instance, a loose bracket, a non-working brake or failures caused by human error. Based on the question "what would happen if …?", the specific risks are then worked out in the next step.

Finally, the evaluation determines the ratio of the severity of the possible accident to the probability of its occurrence. Using a risk matrix all identified risks can be clearly represented in a three-dimensional bar chart. This makes it possible for inspectors and technical staff to immediately identify where the risks are and how urgently they need to be attended to.

Jeroen Bosch from Toverland and Kees Bakker inspect the tracks of the wooden roller coaster, the biggest of its kind in Benelux countries.

X-ray images depict the safe operation of the lap bars (from left: Michel Harinck, Ruud Veugelers, Kees Bakker, Jeroen Bosch, Nick Smedts).

A "Troy" car in the workshop (from left: Kees Bakker, Michel Harinck and Toverland employee Nick Smedts).

Nederland, undertakes risk analyses at 45 amusement parks and 10 water parks in the Netherlands, Germany and as well as other countries in Europe, Asia and the Americas.

Risk analysis goes beyond the mere inspection and maintenance of the apparatus: "The first step toward effective maintenance work is knowing the risks that go with the rides. To this end we take a thorough look at each amusement ride and can then work with technicians and operators to reveal weaknesses that might not be picked up on in normal maintenance," says Mr Bakker. There are two types of risk analysis: "The design risk analysis takes place during the construction of the ride, we review and approve it. For us it's the operational risk analysis which matters. This is performed for the first time during commissioning and is then regularly updated."

SAFETY AT TOVERLAND

Since 2005, TÜV Nederland has been the first point of contact for risk assessment in the Toverland amusement park near Venlo. Since 2007, one of the main attractions in the park has been the wooden roller coaster "Troy". Rising up to a height of 33.5 metres and at 1,040 metres in length, it is the largest of its kind in the Benelux countries. The construction features 2,500 cubic metres of timber, 90,000 bolts and a full sea container's worth of nails. Two trains, each of which weighs eight tonnes, negotiate the numerous bends at high speed – on a track which is, moreover, inclined over its entire length. "With a such a complex ride, constant safety reviews have top priority," says Ruud Veugelers, who runs the technical department at Toverland.

PRECISELY TAILORED SOFTWARE

The risk analysis was significantly simplified last year thanks to new software (see box on p. 18). This was developed by Michel Harinck. The engineer worked at TÜV Nederland as a jobbing student and made software-supported risk analysis the theme of his dissertation. "What they had previously used was a system from the offshore industry which could also be applied to rides and a documentation tool that had way more functions than we actually needed. Simpler implementation needed customised software."

For the development of an application tailored to amusement parks, Harinck tested several risk identification and assessment methods, some of the features of which were incorporated into the new software. "In the accompanying manual we explain the 13-step structure in which risks associated with rides are identified, assessed and evaluated. This gives us a clear structure for all rides – and a readily comprehensible, easy-to-use system," says Harinck. This is great news for Toverland – and, last but not least, for the visitors, who can now feel completely safe even on the most nerve-jangling of rides. ◄

THE DIGITAL THIRD MAN

Aircraft engines are becoming ever quieter and more environmentally friendly thanks to digital technology. HIREX ENGINEERING is helping to ensure that the FADEC electronic engine control system works reliably.

When aircraft manufacturers started to install just two seats instead of three in airliner cockpits in the 1980s, this was something of a mini-revolution. Since that time, planes have generally been flown by just the pilot and co-pilot. The flight engineer, a third crew member whose job it was to supervise the instruments, has become surplus to requirements. This job is now done by digital technology. Take the example of aircraft engines: Sensors collect any amount of information, such as the density of the air and the pressure in the engine, in some cases more than once a second. On the basis of these data, a digital control system such as the Full Authority Digital Engine Control (FADEC) monitors and regulates variables like, for instance, fuel supply, speed and thrust reversers, so the propulsion system always works with optimal efficiency and minimum fuel consumption. The system also permits the monitoring of engines from the ground. Technicians can, for example, identify which components will soon need to be replaced or repaired.

Electronic memory components have to withstand temperatures ranging from –55° to +125° C.

These are then simply renewed at the next stop, saving time and money. "FADEC is part and parcel of the big data concept in the aviation industry," explains Yannick Soler, quality manager at HIREX ENGINEERING (HRX), a subsidiary of ALTER TECHNOLOGY TÜV NORD ATN, based in Toulouse.

HOW HIREX ENGINEERING DOES ITS TESTING

In the selection process, FADEC components must prove themselves in rigorous tests in the HRX laboratories:

STRESS TEST – TEMPERATURE AND HUMIDITY: In the Highly Accelerated Temperature and Humidity Stress Test (HAST) semiconductor components are exposed to heat and humidity in a hyperbaric chamber. In this manner HRX examines how efficiently the protective cover is shielding the technology so that it can operate reliably under extreme conditions.

AGEING TEST: The life test simulates a real-time application, as it were, in fast motion, to accelerate the ageing of the components. This verifies the extent to which they can be relied on to remain in continuous operation

TEMPERATURE CHANGES: By exposing the components alternately to very high and very low temperatures, the extent to which the components are able to withstand mechanical stress becomes apparent.

Plastic components are exposed to heat and humidity in the HAST test.

Material analysis of components using an electron microscope and X-ray technology.

An integrated circuit on the test bed.

HRX has been working for more than a decade for the FADEC manufacturer Sagem. This belongs to the Safran group which produces, among other things, aircraft engines. "We select suitable components for the production of FADEC – from humble plastic parts right through to complex memory modules," explains Frederic Tilhac, Test Lab Manager at HRX. Usually, however, these components are not intended for use in aeroplanes. FADEC is installed on the engine and must be able to work reliably even at extreme temperatures, or in conditions of humidity or vibration, or in salt-laden air. "The components must withstand, for example, temperatures between –55° and +125° C, in some cases up to 175° C. With extensive testing and analysis, we simulate real operation conditions and make sure that the components meet all the requirements of our customers," says the micro-electronics engineer.

UNCOVERING COUNTERFEITS

The 45 employees of HRX test over 200,000 parts per year for a dozen customers in the aircraft industry. HRX also keeps a watchful eye out to ensure that only original parts are used. "Projects in the aircraft sector often run for 30 years or longer. Which is why components sometimes have to be purchased from brokers. We make sure our customers don't get any outdated or counterfeit parts for the entire life cycle of the production," says Soler.

NEW ENGINES, NEW TEST EQUIPMENT

HRX is also involved in the development and construction of the latest generation of engines from the Safran Group, the LEAP motor. This consumes 15 percent less fuel than its predecessor, is much quieter and more environmentally friendly, and is responsible for getting such aircraft as the Airbus A320neo and the Boeing 737 MAX airborne. "As more and more functions on the plane are switching to electronic control, the data streams generated are growing," explains Tilhac. "So the capacity of the on-board computers is increasing. Devices and storage media are having to deal with increasingly complex tasks and work more quickly. To allow us to evaluate new types of components, we keep our test facilities and our know-how constantly up to date."

Sometimes, however, even digital technology and the careful selection of components cannot completely exclude the possibility of faults. In 2015, for instance, various different airliners around the world had to be grounded. The reason: A component that converted hydraulic pressure into an electrical value was failing under cold conditions. HRX was able to help here too: "We carried out a special test at –65° C and tracked down the fault in the part," reports quality manager Soler. In this way, HRX is helping to optimise the performance of the digital third man in the plane. ◄

MORE LIGHT! WHERE CHINESE PHOTOVOLTAICS ARE GOING ON STREAM

The energy of the future is limitless, for example in the form of sunlight. The second largest solar park in the world is currently under construction in Pakistan – built with high tech from China, and maintained and certified by TÜV NORD.

Allthough you might not believe it from the air quality in Beijing, China is the largest producer of renewable energy in the world. In 2014 the country invested around 76.6 billion euros in electricity generation from wind, water, biomass and sunlight – almost one third of the total global investment in this area, which was just under 250 billion euros.

> "China is working on improving the efficiency of photovoltaics, and this trend will continue for a long time."
> Ting Ting Xu, Head of Photovoltaics at TÜV NORD

Besides clean energy, China needs markets for its power plants, wind turbines and solar collectors. With its concept of "One Belt, One Road", the country is strengthening its trade partnerships along the New Silk Route (see box on page 24), initiated by Chinese President Xi Jinping in 2014. One such trading partner is Pakistan, a country that has suffered considerable energy problems for many years, and where industry and agriculture are held back by power failures which can last for hours. But fortunately there are sources of energy are available – above all, sunlight.

VALUABLE HEAVENLY GOLD

Since October 2015, China has been helping its neighbours to make use of this "heavenly gold". In the desert near Bahawalpur in Punjab Province in the south of Pakistan, the Chinese high-tech company Zonergy is currently building the Quaid-e-Azam solar park. When completed, it should have a capacity of 900 Megawatts per year. The first 100-Megawatt installation was already complete after three months and has undergone final inspection by TÜV NORD. The plant comprises 400,000 solar modules covering an area of 200 hectares, which corresponds to an area one kilometre wide and two kilometres long. Once the entire solar park is finished, it will consist of 5.2 million solar modules – in other words, it will reach eight times its present size. Then Pakistan will have its first solar park – and the second largest in the world.

THE QUALITY OF THE ELECTRICITY MUST BE RIGHT

"The cooperation began in October 2015, and in December, we completed the safety inspection for the first of the nine solar installations. We're currently testing the performance capacity", says Ting Ting Xu, Head of Photovoltaics at TÜV NORD in China. The solar farm construction is in many respects a ►

Kevin Zhu (l.) and Alfie Jiang, technical experts TÜV NORD China, know the challenges posed by the solar park in Pakistan.

400.000 solar panels are already installed. The area spans 200 hectares, once finishined it will be eight times bigger.

The collaboration with the engineers of Zonergy and TÜV NORD China is working perfectly.

High voltage demands extreme security measures.

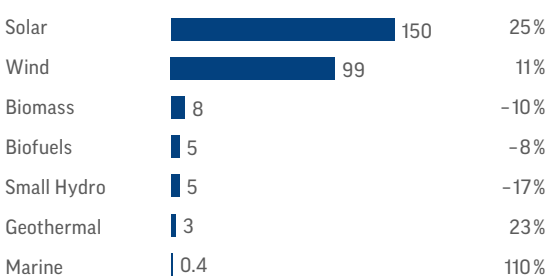
THE NEW SILK ROUTE

The 10,000 kilometre long trade link between China and Europe, which – via a land and sea route – was a means of trading gold and precious stones alongside silk into the 13th century, and also of exchanging religious and cultural ideas, is experiencing a renaissance. In May 2014 a 5,000 kilometre long section of the Silk Route which lies in Asia was granted the status of a UNESCO world heritage site. At the same time, the Chinese President Xi Jinping announced the launch of the "New Silk Route" project, which also links China and Europe via a land and sea route. However, this does not end at the Mediterranean Sea but leads to Venice via Moscow, Duisburg and Rotterdam. This is where the sea route, which also includes Nairobi in Kenya ends. The background is that: China wants to strengthen its links with Europe, its most important trading partner, and to create new transportation routes for its exports. The idea is to make energy supplies more secure. Pipelines from Pakistan, Burma and Turkmenistan bring natural gas and oil to China, which means that China is less dependent on oil from Russia and the Arabian Peninsula. The solar park in Pakistan can be seen as one project within the New Silk Route undertaking.

► pilot project. The safety requirements are immense – and TÜV NORD is responsible for ensuring that they are met. The inspections are carried out in several stages. And safety is the top priority, as Ting Ting Xu explains: "We have just carried out the final inspection before the first 50-Megawatt installation goes on stream." There are areas with high and medium voltage, and also relay protection devices. The voltage that leaves the power plant must be adapted to the local electricity network, and if the installations are defective, fires or dangerous electric shocks could result.

And another thing: the power generated in the desert must be transported over large distances before it is

MORE INVESTENTS IN RENEWABLE ENERGY IN 2014
Global new investments* by sector and growth compared to 2013



* in bill. US dollar, source: UNEP, Bloomberg New energy Finance

The security of the circuit points has first priority, because otherwise the risk of electric shocks and fire is high.

used. This can also lead to voltage fluctuations, and in the worst case, the local electricity network could be threatened with collapse. Both the amount of energy that is fed in and its quality must fulfil the highest standards. "It is essential to ensure that the quality of the energy produced is compatible with the local conditions", explains Ting Ting Xu.

MULTIFACETED SUPPORT

In addition to the final inspection, several TÜV NORD inspectors assess the different stages of construction and provide technical support. They check the quality of the concrete that is used, the depth of the cable shafts and the material strength of the individual components. As Ting Ting Xu says: "The design lifetime of the total installation is 25 years – and the quality requirements for the individual elements employed in its construction are correspondingly high."

The second important aspect of the TÜV NORD inspection work concerns the performance capability of the installations. Ting Ting Xu: "The rays of the sun that strike the photovoltaic panels cannot be completely transformed into energy. The process of energy generation involves numerous stages and losses occur at each stage." In order to increase the efficiency of the installation, the losses have to be minimised. Inspections, tests and documentation in the area of direct current have to comply with certain standards. At the photovoltaic site itself, TÜV NORD China is testing the polarity, insulation and earthing connections and undertaking operational testing of the various photovoltaic modules. "As soon as we have completed these tests, we will develop proposals for the optimisation of the installation. We want to help Zonergy to increase the profitability of its power generation operations", says the TÜV NORD photovoltaics specialist.

PIONEERS IN PAKISTAN

Together, Zonergy and TÜV NORD are acting as pioneers in Pakistan. TÜV NORD is not only the chosen partner for the construction, installation and maintenance of the solar park. The experts from the inspection company are also supporting the Chinese high-tech construction company with the approval process for the Pakistani authorities. The requirements to be met are strict. As an independent service provider, TÜV NORD has the relevant information from all the different phases of the project and places this at the disposal of the authorities. "We need some time for this, as we have to get to know the specific procedures in Pakistan. But the next projects will be faster", says Ting Ting Xu. And it is safe to assume that there will be more projects in the future. "China is working on improving the efficiency of photovoltaics, and this trend will continue for a long time." Instead of silk and gold, today it is high-tech from China that is being carried through the Middle East towards Europe. ◄

DRIVING ON AUTOPILOT

With an initiative for the safety of autonomous driving, TÜV NORD is seeking to create a platform for mandatory standards. The cooperation with the Fraunhofer-Gesellschaft is placing the initiative on a broad base. An article by Matthias Busse.

No longer is it the stuff of distant future visions: Vehicles which drive either wholly or partly independently. Partially automated vehicles have systems for assisted braking in the event of danger, monitor the distance to the vehicle in front and provide assistance in parallel parking. Many vehicle manufacturers are already testing such systems and expect not just additional comfort and convenience for drivers and passengers but also a significant contribution to road safety and accident prevention. Transport using autonomous vehicles is becoming more efficient and safer. To allow all of this to work smoothly, vehicle systems are becoming ever more complex. The simple fact is that it is much more difficult to develop an autopilot for the cars on our roads than it is, for example, to create one for a plane. Our road traffic is primarily organised using visual signals such as signage and traffic lights. An autonomous vehicle must be able to recognise and evaluate these visual indicators and implement the appropriate steering functions. This is a highly complex task. It is no coincidence that leading IT companies, such as Apple and Google, have turned their attention to this topic. Autonomous vehicles are morphing into high-performance computers on wheels. Software is becoming ever more important in comparison to conventio- ►

> "The aim must be to turn Germany into the leading market for autonomous driving."

PROF. DR.-ING. HABIL. MATTHIAS BUSSE
Director of the Fraunhofer IFAM in Bremen

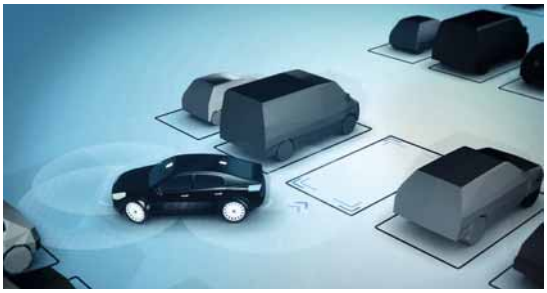
ABOUT THE AUTHOR

In September 2002 Matthias Busse was appointed to the chair of Near-net-shape Manufacturing Technology at the University of Bremen. Since April 2003 he has also been responsible for running the Fraunhofer-Institut für Fertigungstechnik und Angewandte Materialforschung IFAM in Bremen. He acts as spokesman for the Fraunhofer Systemforschung Elektromobilität (system research into electric mobility) and is the director of the Fraunhofer Project Centre in Wolfsburg with responsibility for electric mobility and lightweight construction.

The expectations of automated driving are centred on gains in comfort and convenience and enhanced road safety.

The communication between the vehicles themselves requires completely new services.

Automated driving presents development opportunities for Germany as a place of business.



Parallel parking aids assist the drivers of partially automated cars.

► nal "motor vehicle hardware" and may one day even completely eclipse the latter. Last but not least, fully automated driving will also permit the development of completely new business models. Communication between vehicles (Car2Car), the interaction of vehicles with the transport infrastructure (Car2X) and the interaction of the driver with the vehicle system are based on the exchange of data in the context of complex real-time systems that require completely new services. And this in turn will pave the way to completely new development potentials for Germany as a place of business. The aim must be to turn Germany into the leading market for autonomous driving. But, if this is to happen, manufacturers, suppliers, partners from research and development and the authorities must all pull together.

HIGH DEMANDS ON VEHICLE SYSTEMS

The resulting demands on future vehicle systems will be colossal: Safety, data protection, reliability and the availability of the systems involved are just a few of the aspects. We also need reliable testing and approval procedures for such vehicles and vehicle systems. And this is exactly where the SAVER initiative comes in. SAVER stands for "Strategic Autonomous Vehicle Engineering And Regulations". The intention is to ensure that such autonomous driving systems make their way onto our roads safely and in a standardised and verified manner. It is to this

> "What we need is the definition of valid test scenarios for autonomous systems and advanced driver assistance systems (ADAS)."

end that a collaboration between TÜV NORD and the Fraunhofer-Allianz Verkehr (Transport Alliance) is coming into being. The Fraunhofer institutes and facilities are set up in particular categories of expertise and collaborate in alliances with one another. In the Fraunhofer-Allianz Verkehr, institutes which are dealing with overlapping issues in the areas of mobility and transport have joined forces. This is allowing stakeholders to draw on the relevant core technological expertise of many Fraunhofer institutes in the context of the SAVER initiative.

The primary concern here is to take the results from research and development and to apply them reliably in real life. And, what's more, to secure official approval for the use of such systems in vehicles. At the heart of the matter is the assessment of risk factors and the development of reliable simulation methods to evaluate these factors. Data security and data protection play a key role here. The relevant standards and norms for the data interface and its

The interaction between driver and vehicle is based on data exchanges in the context of complex real-time systems.

associated protocols must be harmonised and defined internationally.

ACCEPTANCE DEPENDS ON USABILITY

However, the issue of the validation of such systems in the sense of type testing and approval procedures is still largely unresolved.

What we need is the defination of valid test scenarios for autonomous systems and advanced driver assistance systems (ADAS). The onus is on the ministries and authorities first of all to create the necessary regulatory conditions.

Last but not least, the integration of the driver into such systems must be regulated. Who has control at which time over the entire vehicle or just a sub-system and exactly how the handover works are all issues of crucial importance. The ease of use of such systems will also determine whether or not they are accepted by the buyer.

UNIQUE NETWORK

With the SAVER initiative, a platform is being established to enable expert partners to work in a specifically targeted manner on resolving these complex issues. Original equipment manufacturers (OEMs), authorities, insurance companies, service providers and suppliers will thereby have at their disposal a unique network to gather and make use of comprehensive information on the latest developments in the field of autonomous driving. ◄

AUTOMATED DRIVING – A SAFETY INITIATIVE

With SAVER (Strategic Autonomous Vehicle Engineering and Regulations), TÜV NORD has launched an initiative for autonomous driving. The idea is to work with Fraunhofer-Allianz Verkehr to ensure that complex systems are safe and standardised before they reach the road. TÜV NORD experts stress that a new definition of safety and data protection is needed to make autonomous driving successful. The aim is to establish a common platform to this end. The goal is to transform Germany into the leading market for automated driving.

TÜV NORD will offer support in the context of the initiative in all the stages of the development of automated driving and work with manufacturers, suppliers, partners from research and development and authorities on the drafting of standards and rules.

CLARITY IN EVERY DETAIL

Accident, purchase or return – just three of the many reasons why people request vehicle damage reports or valuations. But, whatever the reason, speed is always of the essence. Thanks to digital technology, TÜV NORD delivers finished analyses within just a few hours.

Just one moment of carelessness or distraction is all it takes. About 6,000 times a day German roads are the scene of traffic accidents in which, happily, the only damage done is to vehicles. According to the Federal Statistical Office, in 2015 there were approximately 2.2 million accidents involving only material damage. This represents an increase of four percent in comparison to the previous year.

It therefore follows that car owners and insurance companies need fast and reliable damage reports that will shed light on the likely repair costs and the effect on the value of the vehicle. "Just like classic testing services, these reports are among our core competences. Our experts analyse and document the damage down to the smallest detail," says Chris Wengler, Head of the TÜV NORD-Schadencenter (damage centre). The experts can submit reports that may be used in court within just a few hours – offering the best chances of a straightforward claim.

What makes this possible is digital technology in conjunction with efficient team work. In a one-year

In line with the four-eye principle, an expert at the headquarters follows the damage analysis live on the screen.

DAMAGE REPORTS AND VALUATIONS: A MARKET WITH POTENTIAL

The range of customers for this service is large. The clients include, for example, insurance companies, for instance when their customers file accident reports and they are required to process claims. The insurers also commission third parties with special reports or technical advice. Another customer group, that of the car makers, for example, centrally generates reports for leasing returns. Moreover, nearly every major car maker now has an its own insurance arm. And there are also the private customers or, as the case may be, the customers of the TÜV STATIONS: The scenarios include, for instance, claims in the wake of a rear-end collision or the drafting of valuation reports – for example for a vintage car, an acquired company car or a car inherited as part of an estate whose value must be determined for the tax authorities.

The on-site expert uses the video camera to send live images of the accident vehicle to his colleagues back at base.

pilot project, for instance, TÜV NORD successfully tested the use of high-definition cameras for the assessment of vehicles involved in accidents in the Hanover region. Whereas damage assessors and valuers used to operate as lone wolves, the assessment of damage can now take place in line with the four-eye principle with virtually no loss of time.

A FAST TEAM

As before, an expert examines the damaged vehicle on the spot in the presence of the customer. But instead of just documenting the damaged vehicle parts with a camera so that cases of doubt may be assessed back at the office on the evidence of the pictures, possibly with the help of a colleague, the expert now carries with him an Internet-compatible video camera. This connects him via live streaming with a second expert back at HQ. Together they inspect the damage. The camera can also be used to take and transmit photos for the assessment. "By involving an additional expert we've not only introduced one more level of quality assurance but also save time in the drafting of the report. The experts back at HQ get to work on the corresponding report while the vehicle is still being analysed. The on-site expert just needs to provide the finishing touches," says Wengler. The time saved will also benefit the workshops because they can use the report to predict exactly what to expect and schedule in the capacities and order the spare parts they need in good time, Wengler continues.
He is confident that the four-eye principle using remote diagnostics can be applied in a variety of damage situations. All the more so as the experts in the twelve-member project team have appropriate additional qualifications that cover all the legal aspects in addition to the technical side. "But, of course, we know the limits of remote diagnosis," admits Wengler. "At the end of the day the member of staff only gets a 2-D impression. For this reason a damage report using a camera is useful for small and medium-sized losses. For complex damage such as that caused by a fire or suffered by large tractors, everything depends on first-hand impressions. The inspection is very extensive in these cases, and so it takes longer," explains Wengler. But because it provides the lion's share of the damage reports in the area of minor bodywork damage, the new service provided by TUV NORD is perfectly tailored to the needs of the market. ◄

IF LIFTS COULD LEARN TO TALK

Smart technology, networked sensors, real-time data: Lifts could also soon be part of the "Internet of Things". TÜV NORD is working to usher in a new era of system testing.

Here is something of an oddity for the land of officialdom and legal requirements: No one knows exactly how many lifts there are in Germany. The Verband der TÜV (VdTÜV) places the number of lift systems requiring monitoring at 690,000. According to the technical systems safety report of 2015, it is likely that around 150,000 lifts fall through the testing net. As far as the possible safety defects are concerned, one can only speculate. Even with those lifts where a testing regime is in place, the specialists recorded an increase in the proportion of systems with significant defects to 7.4 percent. But there is also some good news: Just under 57 percent of the elevators were completely free of defects.

Lifts are commonly considered the safest means of transportation in the world. So that it can stay that way, they have to be rigorously tested in a general inspection every two years – just like cars – by an approved monitoring authority like TÜV NORD. There are also interim tests, meaning that a lift will on balance have been tested at least once in any given year.

COMPLEX MONITORING

The general inspection is a time-consuming affair. "The checks are very comprehensive and complex," explains Martin Kisch from the Corporate Centre Innovation. He is the manager of the "Digital Lift Inspection" project of TÜV NORD, the idea of which is to use digital aids to make the process more efficient – without compromising safety. In the inspection, the TÜV tester is assisted by a technician from the maintenance company. All components, such as the driving gear, brake and doors, are scrutinised and tested for functionality on site. The tester performs the individual inspection tasks in the lift cabin itself or in the shaft.

Among the most time-consuming tests is the driving gear check for cable-driven lifts. This determines how much weight the drive can displace before the cable starts to slip on the drive sheave. Thanks to ASIS II, TÜV NORD's patented electronic testing procedure, no ballast weights are required for this task. Instead, the lift is literally placed in chains. These chains are in turn equipped with force sensors and fix the cabin in a specific position. The output of the motor is then increased until the cable starts to slip on the drive sheave. The results are collected and evaluated on the tester's laptop.

LIFTS UNCHAINED

A multidisciplinary TÜV NORD-team is currently developing an app to evaluate the test results in situ using a smart phone or tablet instead of a laptop. "This will increase ease of use and save time, boosting productivity without impairing safety and reliability," Kisch says.

The inspection sticker shows the scheduled date of the next lift test.

In the lift shaft, the testers check components such as the drive gear, brake and doors.

The electronics are also scrutinised very closely.

The results are logged using an app.

TÜV NORD is already carrying out initial practical tests in Germany with the innovative app. A similar system is already in use in the Netherlands. The idea is to optimise the ASIS II measurements even further. For example, work is currently being done on a driving gear test using acceleration sensors that does not require heavy and cumbersome chains. Another plan is to install a Wi-Fi module in the measuring box to further simplify data transmission from the cabin to the mobile device.

However, the transfer of system testing to mobile devices will not by any means mark the end of the "Digital Lift Testing" project. After all, lifts are also one day set to become part of the "Internet of Things": the idea is for data to be exchanged online without human intervention. "What we want, if you like, is to teach lifts to talk," says Kisch. To do this, they will need networked sensors to transmit their measurement data directly via the Internet. With the aid of smart technology, lifts should one day be in the position to independently identify errors and trigger alerts via the Internet, ideally before damage or a breakdown occurs. Experts would then be able to access these detailed data in the course of the test.

A BLUE BOX FOR LIFTS

Before things can get to that point, however, some hurdles remain to be overcome. For example, negotiations are currently underway with leading lift manufacturers. The aim is to clarify whether and how the testers will have access to the manufacturers' sensor data. To this end, TÜV NORD has joined forces with the Fraunhofer-Institut für Intelligente Analyse- und Informationssysteme (Intelligent Analysis and Information Systems, IAIS) to develop a blue box for lifts. ◄

THE NEW ORDINANCE ON INDUSTRIAL SAFETY AND HEALTH (BETRSICHV)

According to the BetrSichV (Germany's ordinance on industrial safety), which came into force in June 2015, passenger lifts must be regularly checked by an approved monitoring body such as TÜV NORD. The results must be kept on site and be accessible to the competent authority.

In order to meet this requirement efficiently and in an environmentally sound manner, TÜV NORD is using stickers with quick response codes (QR codes). In this way, system operators or other authorised users have the option at any time to easily gain access to the test certificate and other data via the QR code, for example, by using a smartphone. These data are stored on a protected TÜV NORD Extranet site.

LEARNING IN THE AGE OF DIGITALISATION

The advent of digital media in the classroom is set to change the way in which knowledge is communicated. For students this means a higher degree of self-organised information-gathering. But this will not render teachers surplus to requirements.

Digital media are indispensable to our daily lives. Schools and non-school educational institutions cannot ignore this development. Many of them have high expectations of the increased use of digital media, especially in the context of the presentation of material: learning must more than ever be "self-regulated", "self-organised" and even "self-determined", which is in general viewed as synonymous with the increased side-lining of instruction by an actual human teacher. It is for this reason that, for some years now, the investment of significant financial resources has been driving the use of laptops and tablets at schools and non-school educational institutions. The idea is that such devices should be used not only in support of traditional teaching: learners should instead be called on to actively search for information on the Internet both in and away from the classroom.

DR. GERHARD ROTH
Professor at the
University of Bremen

ABOUT THE AUTHOR

Gerhard Roth, born in 1942 in Marburg/Lahn, has been Professor of Behavioural Physiology and Developmental Neurobiology at the University of Bremen since 1976 and, alongside many other commitments, was President of the German National Academic Foundation from 2003 to 2011.

AMBIVALENT RESULTS

The use of digital media in classroom teaching has been the subject of a number of laptop initiatives, such as the "mobiles lernen-21: notebooks für Nieders@chsen" project, one of several projects which have subsequently been evaluated. Viewed in a positive light were the possibilities presented by the use of laptops, for instance in physics lessons to illustrate physical processes and in the evaluation of experimental results, as well as in text work in German lessons. At the same time, teacher-centred instruction was superseded to a significant extent by the independent acquisition of information on the Internet in group and individual work, which naturally led to an improvement in the skills involved in the use of digital media.

With regard to the central question of whether and to what extent learning performance also improved with the large-scale use of laptops, the results of the Lower Saxon initiative were ambivalent, as were those of other comparable initiatives. The finding was that, at the very worst, the performance in individual subjects of the students in the laptop classes was no worse on average than that of their traditionally instructed peers. This would mean that, on balance, the initiative achieved nothing because the advantages and disadvantages cancelled each other out. Critics of the scheme have accordingly asserted that

Learning with computers and new media also requires the support of trained teachers.

an increase in the acquisition of information via digital media by no means automatically results in an increase in knowledge in the sense of actual comprehension, and that deficits in arithmetic and mathematics and in spelling and comprehension tend to increase rather than decrease. A whole array of education specialists and media instructors have lined up to voice their shared opinion that the presence of a teacher to support students in their use of digital media remains indispensable. And yet, this role is to be cut back for both ideological and financial reasons. Without a guide, learners tend to uncritically accept information procured "independently" by means of smartphones, laptops, tablets and the like. Such learning experiences are unlikely to be sustainable without the corrective offered by actual teachers.

Here, too, we have confirmation that a skilled, trustworthy and sensitive teacher, who guides the learners to a position from where they can acquire knowledge and skills by themselves using a combination of instruction, feedback and encouragement, is the most important authority for school and non-school learning. This does not mean the total banishment of digital media from educational institutions, as is vehemently demanded, for instance, by neuroscientist and psychiatrist Manfred Spitzer. In the hands of competent teachers, digital media can stimulate learning. In the hands of a teacher who sees the use of digital media merely as a way of reducing his or her workload, they are a bad tool. Often, however, the teachers are inadequately trained. Such training is wearisome and costly and is therefore usually avoided. ◄

> INTERVIEW

AXEL DRECKSCHMIDT
General Manager of the TÜV NORD Akademie

ACTIVELY SHAPING DIGITALISATION

What does digitalisation mean for the TÜV NORD Akademie?
Axel Dreckschmidt: As a provider of educational and training services we want to actively help shape this trend. Our customers are increasingly asking for e-learning. What's more, we're constantly questioning our processes in the light of digitalisation. Where our customers are being driven by the forces of Industry 4.0 and Work 4.0, we too have to get involved in the transformation process in terms of what we offer.

What kind of experience has the TÜV NORD Akademie had of e-learning?
Dreckschmidt: Despite the positive trend in the e-learning market, our face-to-face seminars remain very popular. This is down to the interaction between trainer and participants and the personal exchanges between the participants themselves. This is why we've opted for blended learning, where face-to-face seminars are augmented but not replaced by e-learning.

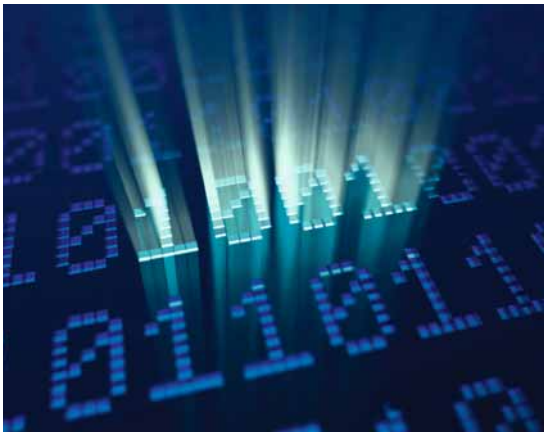
How will the further training programmes develop in the future?
Dreckschmidt: Initiatives like Project Loon (Google) or Facebook Internet drones should grant more and more people access to the Internet and, thereby, to education. For further education institutes this offers great potential. However, we see ourselves primarily as well placed in other market segments and are going to drive our growth there by means, for instance, of educational consultancy work and product diversification.

A GUIDE TO IT SECURITY

IT security must surely be the greatest challenge faced by companies which have set out on the path to Industry 4.0. To help them face up to this challenge is the role of IT security consultants – whose number includes the new consulting company of the TÜV NORD GROUP.

The economy is standing on the threshold of the fourth industrial revolution. In the course of digitalisation, machines in the real world will join forces with the virtual Web to create the "Internet of Things". In tomorrow's industrial production, products will be highly individualised and produced in a highly flexible manner. And, because computers and machines are in the process set to become increasingly networked, the security of systems and data will be confronted with ever greater challenges. Which is why companies are being forced to deal with possible risks.

Whatever the organisation – be it a hospital that uses medical equipment, an electricity company kitting out its customers with smart meters or a retailer offering new shopping services in their stores using smartphone apps – there is one thing they all have in common: Not only are they exploiting the opportunities of digitalisation but they are also having to turn their attention to the associated risks; after all, increasing networking is also opening up new security vulnerabilities. But what risks does a company have to take seriously? And which security and defensive measures are the right ones for a company and its business models? As companies are increasingly drawing on the expertise of IT security consultants to find answers to these questions, the TÜV NORD GROUP decided to launch a new consultancy company with precisely this focus. This company can from the outset call on the resources of the major services group that is the TÜV NORD GROUP, which has already been dealing intensively with IT and Industry 4.0 for some time.



Digitalisation has many advantages but also brings with it new risks that every entrepreneur should address.

DIGITALISATION – A SAFE BET

Companies which are forging ahead with the digital transformation of their business will do well to take IT security into account from the outset," says Dirk Kretzschmar, General Manager of TÜViT. "Retrospective implementation is either expensive or even impossible." Ever large numbers of companies are coming to this realisation and upgrading their IT security. At the same time, the number of solution providers in this area is increasing. Whatever the product, be it intelligent firewalls or security information and event management systems, it is now almost impossible to keep an overview of the range as a whole. Not only SMEs but large companies too are often overwhelmed when it comes to the selection of a perfectly tailored solution. The need for advice which arises here is being covered by the TÜV NORD GROUP

In the age of Industry 4.0 the role of IT security is becoming more critical than ever before.

> INTERVIEW

DIRK KRETZSCHMAR
General Manager
of TÜViT

WHAT DO IT SECURITY CONSULTANTS DO?

Why is the demand for IT-security consulting increasing in companies?
Dirk Kretzschmar: The IT Security Act for Critical Infrastructures, such as those found in the energy or financial sectors, has for the first time laid down a mandatory framework for companies to provide evidence of the implementation of IT security measures. The state requires this of the companies concerned. These must now specify industry-specific IT security catalogues which can be used to review the implementation of the measures. This means that critical infrastructures are being presented with major challenges that are hard to manage without external assistance. Although IT has long been part of everyday working life, IT security is only rarely a corporate core competence.

What is the biggest challenge for IT security consultants?
Kretzschmar: Only critical infrastructures are legally obliged to implement the IT security measures. No-one else is required to do so. Of course, that doesn't mean that the issue is less critical for other companies. The implementation of IT security measures depends entirely on the Management Board's awareness of the risks and the skills and commitment of the IT administrators. So the biggest challenge for IT security consultants is to successfully highlight the existing risks to the business and to bring them into line with clear, modular IT security measures.

with its new consulting firm. The idea is for the company to work with its customers to analyse the IT security issue across multiple dimensions and draw up recommendations for action.

Here, the minimisation of cost and risk plays a decisive role in the consulting approach. Questions such as "what skills are available in the company?" or "what expertise is still required?" are answered by the consultant in advance. Medium-sized companies in particular, but increasing numbers of major companies too, are delegating their IT systems in the context of outsourcing and cloud computing to external service providers. "Many companies have no or too few IT specialists. That's why they don't know what skills they need to develop in the IT security area," explains Kretzschmar. "This shortcoming is not recognised as a business risk. So it follows that there's also uncertainty with regard to the budgets needed for IT security measures and supporting advice."

Ultimately, the goal is to define a comprehensive IT security strategy. This formulates the goals of information security and the principles for the implementation of measures. Moreover, it also sets out the company's stall with regard to trends and new technologies. "The earlier companies adapt to the new, increasingly complex security situation, the more efficiently and securely the IT systems will do their work. This will also serve to boost the chances of success of the digital economy in general," says Kretzschmar. ◄

TÜV NORD GROUP

Excellence for your Business

CONSOLIDATED FINANCIAL STATEMENTS

2015

GROUP MANAGEMENT REPORT

FUNDAMENTAL PRINCIPLES OF THE GROUP

Business activity

The TÜV NORD GROUP, with over 10,000 employees, is active in more than 70 countries in Europe, Asia, the Americas and Africa for its national and international customers. The group is divided into the Industrial Services, Mobility, Training, Natural Resources, Aerospace and IT business units. The group has a unique selling proposition in the sector as a whole, particularly in respect of its services in the natural resources and aerospace fields. The TÜV NORD group has been offering its customers a wide range of pioneering services for over 145 years, consisting of extensive and innovative testing, certification, engineering, consulting, and training services. In many regions it is the market leader in these segments.

The certification, service and testing portfolio of the companies in the Industrial Services business unit includes specific individual tests and the management of complex security solutions. The services of the Mobility business unit include the classic statutory vehicle and driver's licence tests as well as vehicle assessments and consultation services in support of the development work carried out by car makers and automotive component suppliers. The Training business unit offers training programmes for specialists and managers as well as publicly funded further education and training. The service portfolio of the Natural Resources business unit includes independent technology-based services in testing, consulting, planning, measurement and development, both at home and abroad, with a focus on natural resources, safety and infrastructure. The Aerospace business unit is the home of all activities concerned in the selection, procurement, modification, testing and certification of electronic components for the aerospace industry. The services of the IT business unit include the testing and certification of all IT products and components, as well as training in selected security and quality issues in the areas of IT security, IT quality and IT infrastructure.

As of December 31 2015, the group, with its management company TÜV NORD AG, embraces a total of 85 fully consolidated companies, 43 of them domiciled in Germany and 42 abroad. The TÜV NORD AG consolidated financial statement includes all major companies in Germany and abroad in which TÜV NORD AG either directly or indirectly holds the majority of the voting rights.

ECONOMIC REPORT

General economic and sector-specific conditions

The global economy saw only moderate growth in the year 2015, a trend which is mainly due to the weakness of the economies in the emerging markets. Low oil prices and the weakness of the euro supported the economy in the eurozone, and the contribution of these twin factors meant that some growth, albeit slight, was recorded. Geopolitical uncertainties, such as the Ukraine crisis, the European debt problem and the interest rate turnaround in the United States, had a particularly depressive effect on economic performance. In Asia, one of the key growth markets of the TÜV NORD GROUP, economic development slowed, particularly in China. India, on the other hand, saw economic growth in 2015. In the Americas, the US continued to record positive growth, whereas the economies of the Latin American countries as a whole continued to stagnate. In Germany, economic development picked up slightly, the impetus coming from the state, private consumption and foreign trade.

In spite of the economic conditions, the TIC (testing, inspection, certification) sector continues on its path of sustained growth. The reasons for this are manifold. On the one hand, global demand for quality assurance is rising. One particular development worthy of mention is the interest in food quality monitoring. On the other hand, companies are seeking to increase the outsourcing of testing procedures because of the complexity of the tests involved. Negative effects were felt in the oil and gas industry in the year under review as a result of a further decline in natural resources prices and the Chinese market due to the economic slowdown. Overall, the trend in the TIC industry was positive.

In general the TÜV NORD GROUP held its own very well in the face of this difficult economic environment and will in the future profit from this vigorously growing sector thanks to its broad-based portfolio and high quality standards.

Business Trends

The successful development of the Industrial Services business unit was once again based on its industrial testing and certification services in 2015. For the Mobility business unit, the year was characterised by robust growth. A comprehensive profit enhancement programme improved the earnings situation of the Training business unit. Weak natural resources markets had a negative

impact on the Natural Resources business unit. The Aerospace and IT business units returned solid growth in a competitive economic environment.

The TÜV NORD group strengthened the Natural Resources business unit with a targeted acquisition. The acquisition of Dr.-Ing. Wesemann Gesellschaft für Ingenieurgeodäsie mbH, Herne, has paved the way to the development of a more comprehensive package of services for geo-engineering services/pipeline engineering within the DMT group. Moreover, dependency on the natural resources markets will be reduced.

The TÜV NORD group grew profitably in the fiscal year under review. As announced in the 2014 annual report and the forecast for 2015, an increase in turnover was achieved in tandem with an improvement in profitability. The best operating result since the founding of the TÜV NORD group was achieved. The increase in earnings is based on the positive results of all business units. The Industrial Services and Training business units ended the fiscal year with higher than expected earnings. The development of the Natural Resources business unit continued to be hampered by weak commodities markets, with the effect that a decline in both sales and profit was recorded. Contrary to the forecast, however, the number of employees remained roughly the same as the previous year. In the context of the strategy 2020plus, a decision was made to further develop the innovation activities of the TÜV NORD group. In the fiscal year 2015, all the business units either introduced new products or processes or continued to develop existing ones.

The trends within the group in the fiscal year 2015 in comparison with the previous year were as follows:

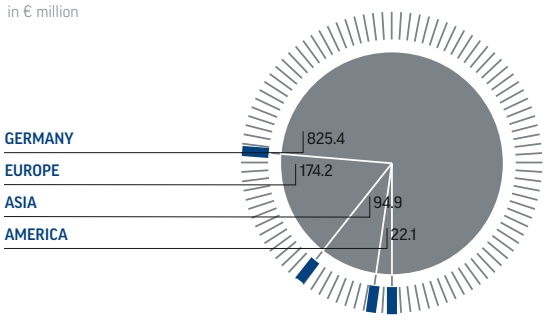
- Turnover increased by 2.5% from €1,089.5 million to €1,116.6 million. The rise in sales of €27.1 million was essentially due to the Industrial Service and Mobility business units.
- Before non-operating items, earnings before interest and taxes (EBIT) rose by 6.0% from €58.8 million to €62.3 million. The increase of the result of €3.5 million can primarily be attributed to the positive development in earnings in the Industrial Service business unit as well as cost savings across the group and comprehensive profit enhancement programmes.
- The return on sales, measured by EBIT, was thus 5.6% after 5.4% in the previous year.
- Earnings before tax (EBT) increased by €5.6 million to €54.8 million and includes €8.8 million provisions and value adjustments.
- The number of employees, including those from first-time recruitment and changes brought about by acquisitions and portfolio adjustments, in full-time employee equivalent, increased from 9,764 to an average figure of 9,794 in 2015. Productivity increased.
- Expenses for innovation in the TÜV NORD group amounted to €11.5 million in the 2015 fiscal year (2014: €7.5 million).

It can in conclusion confidently be stated that the TÜV NORD group is continuing to chart a course of successful development. This is primarily due to the diversified portfolio of services offered by the group's companies in nearly every major country in the world.

Earnings

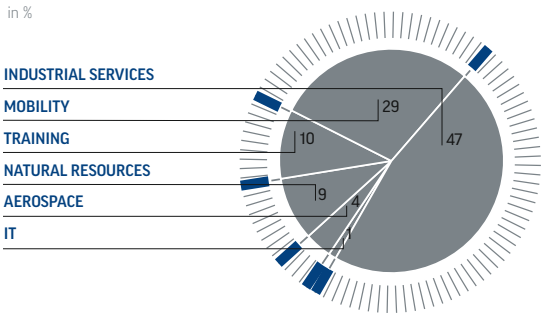
In the fiscal year 2015, sales climbed to €1,116.6 million (2014: €1,089.5 million). The following figure shows the trend of sales in the TÜV NORD group over the past five years (€ million):

Regionally, sales are segmented into Germany, Europe, Asia and America.



In the domestic business of the TÜV NORD group in 2015, revenues of €825.4 million (2014: €811.2 million) were achieved. Turnover from the international business amounted to €291.2 million (2014: €278.3 million), representing a share in the overall business of 26.1%.

The overall share of total sales of the individual business units in 2015 is graphically represented as follows:



Due the heterogeneous nature of their market presence, their various product spectra and their regional alignment, the individual business units developed very differently.

The Industrial Services business unit generated a turnover of €520.8 million (2014: €503.7 million), where the development of foreign business was especially positive. Due to the decline of the conventional power plant sector, sales in Germany increased only slightly, by €0.7 million, to €351.0 million. Sales abroad increased to €169.8 million. The companies in India, China, Europe and Southeast Asia contributed significantly to this rise. The turnover of the Mobility business unit, at €319.3 million, was 4.7% higher than in the previous year, €304.8 million. The growth is primarily attributable to an increase in turnover in the car dealership and workshop segments and at the Institute for Vehicle Technology. Due to the closure of two vocational colleges, sales in the Training business unit fell by 4.1% to €111.1 million (2014: €115.9 million). In the Natural Resources business unit, a turnover of €103.6 million (2014: €112.1 million) was generated. Business development also continues to be adversely affected by weak raw material markets. Sales in the Aerospace business unit increased on the back of rising demand in Europe, Russia and Asia by 18.5%, amounting to €47.6 million (2014: €40.2 million). The sales of the IT business unit increased to €14.2 million (2014: €12.8 million). This was due in particular to the expansion of the service portfolio in the IT security area.

Group expenses increased by 7.5% to €1,161.3 million during the year under review. The cost of materials reached a peak of €198.2 million in comparison to €180.0 million in the previous year. This is primarily attributable to the higher costs of natural resources and of auxiliary and operating materials.

Personnel expense rose by 8.5% to €719.8 million. The principal causes for this were the expansion of TÜV NORD Transfer GmbH & Co. KG as a result of the "Opel" transfer contract. Further information on expenses can be found in the Notes to the Consolidated Financial Statements, under No. 3, Consolidated Income Statement disclosures.

The non-operating items changed from €–10.1 million in the previous year to €–8.8 million in the fiscal year 2015 and principally included expenses relating to risk provisions, value adjustments and measures to boost earnings.

All of the business units contributed to the positive result of the group. Earnings before tax (EBT) amounted to €54.8 million and were thus €5.6 million above the previous year's result of €49.2 million.

Net profit, at €33.9 million, exceeded that of the previous year by 15.5% (2014: €29.4 million).

Assets

The TÜV NORD group balance sheet reveals a sound structure.

Total assets increased to €851.9 million during the year under review, as against €776.6 million in 2014.

Non-current assets rose from €488.0 million to €514.2 million. This was due in particular to the rise in deferred tax assets as a result of increased pension provisions. The rate of coverage of non-current assets (equity plus pension provisions divided by non-current assets) amounts to 102.2% (2014: 94.0%)

Current assets, which make up 39.6% of total assets, are recognised at €337.7 million (2014: €288.6 million). Cash and cash equivalents increased to €84.3 million (2014: €61.6 million).

The group has additional hidden reserves, which primarily take the form of property ownership and investments.

Equity capital, at €101.0 million, is roughly equal to that of the previous year (2014: €100.8 million). The equity ratio amounts to 11.9% (2014: 13.0%).

In the 2015 fiscal year, €724.5 million (2014: €706.2 million) of plan assets were netted against pension provisions. The proportion of the provisions for current and future pension obligations that is not covered by plan assets amounted to €424.7 million

(2014: €358.2 million). The cause for this increase was the significant reduction of the discount rate of pension provisions. The provision for obligations arising out of pre-retirement part-time working amounts to €12.5 million (2014: €15.4 million).

Reinsurance coverage of pension provisions increased by €12.5 million to €750.8 million. Through this allocation of funds, the degree of coverage adjusted for the effects of a change in the discount rate was once again enhanced as compared with the previous year.

Further information on the assets situation can be found in the Notes to the Consolidated Financial Statements, under No. 5 "Consolidated Balance Sheet disclosures".

Financial situation, cash flow

The TÜV NORD group continued to pursue its conservative financial policy in 2015. The most important objectives remain the further maintenance of the group's good rating, the safeguarding of an adequate level of liquidity and the centralised financing of the subsidiary companies by the group at a level that meets their needs.

In addition, it is fundamental to the group's financial policy to ensure a wide measure of financial flexibility and transparent risk and opportunity management.

The German Bundesbank has certified our eligibility for the ninth time in a row. This means that the group belongs to the circle of companies that can be used by commercial banks as collateral for existing loans at the Deutsche Bundesbank and has a preferred position compared to the competition when it comes to access to financial resources. This certification is preceded by a detailed creditworthiness analysis of the figures on the balance sheet. This financial rating assesses the business profile of the group's key figures for profitability, internal financing strength, liquidity and capital structure based on audited financial statements.

The cash flow (see "Consolidated Cash Flow Statement") amounted to €62.6 million and was essentially applied to the reinsurance of pension liabilities, investments in intangible asset and in property, plant and equipment, and equity investments. Capital expenditure excluding corporate acquisitions amounted to €42.1 million in the year under review as against €31.1 million in 2014. Of this, €37.0 million was invested by the German companies, and €5.1 million abroad. The focus was on physical investment in testing equipment, vehicle fleets and computer hardware and software. No material capital expenditure obligations existed as of the reporting date. The TÜV NORD group spent a total of €1.8 million (2014: €3.2 million) on the acquisition of companies and equity holdings during the year under review. All projects were assessed by value creation criteria; every potential acquisition or capital investment project was scrutinised and analysed both with regard to the return it would bring and also from the point of view of its impact on the consolidated balance sheet.

TÜV NORD group's net financial position amounted to €32.3 million at the end of the year under review, a figure which, due to the rise in annual net profit, was significantly higher than that of the previous year (2014: €18.2 million). In addition, the group took out further subordinated registered bonds for €30.0 million at the end of 2015. The inventory on December 31 2015 amounted to €50.0 million (2014: €20.0 million).

The existing syndicated loan for the group in the amount of €175.0 million had not been used as of December 31 2015.

In 2015 the group was in the position to meet its payment obligations at all times.

NON-FINANCIAL PERFORMANCE INDICATORS

Innovation report

The advancement of innovations and environmental technologies is a central mission of the TÜV NORD GROUP. Innovative services are allowing the group to tap into new market areas, enjoy advantages over its competitors and respond successfully to global challenges. Innovations are crucial drivers of growth in the TÜV NORD GROUP and key strategic factors for sustainable corporate success.

In all business units, with innovations ranging from the development of intelligent testing procedures, innovative vehicle technologies, climate-friendly transport concepts or the use of new materials, the TÜV NORD GROUP is striking out along new paths and looking for the solutions of the future. As a result of new industry trends and the associated new technologies (Industry 4.0, big data, smart sensors, augmented reality, wearables, etc.) traditional testing and inspection services are also increasingly subject to technological change. The testing and certification bodies are a driving force for global innovations and development in traditional TÜV fields of activity. At the same time, the growing need of companies and customers alike for quality and safety is taken into account. The expertise of TÜV

NORD employees and the company's global presence offer the best conditions for this need to be met.

The highly qualified staff of the TÜV NORD GROUP are represented in all the relevant committees charged with the national and international development of regulations. Moreover, the TÜV NORD group has committed itself to working with universities and is collaborating with research institutions and research-based companies and organisations.

In the fiscal year 2015, innovation expenditure and investments amounted to a total of approx. €11.5 million, subdivided as follows:

€ million	2015
Process innovations at TÜV NORD Mobilität	4.5
Process development in the Institut für Fahrzeugtechnik (Institute for Vehicle Technology)	3.3
Geotechnical engineering	1.8
Fire and explosion protection, exploration seismology, geophysics	1.0
IT-Service data centre	0.5
Development of TÜV NORD Mobilität laboratory in China	0.4
Total	**11.5**

Our employees are given the freedom they need to develop and pursue new ideas and approaches. With our engineering expertise, we are also enabling our customers to carve out advantageous positions in the global competitive environment and to manufacture innovative products both economically and with a sparing use of resources.

When it comes to the future progress of innovation, the strategy process 2020plus, with its focus on economic development to the year 2020 and beyond, is of great importance. Innovation is one of the main issues addressed by the future workshops in all business units. Megatrends, in particular globalisation, demographic change, and Industry 4.0, serve as the springboard for ideas in this respect. The business units are identifying global trends with which the development of their priorities is to be aligned, such as materials and energy along with the environment and resources. The procedure is accompanied every step of the way by leading strategy consultants. Exchanges between the companies and the business units are encouraged. With this aim in mind, specialists are brought together to engage in dialogue and encouraged to form networks.

In the 2015 fiscal year the individual business units focused in particular on the following projects:

Industrial Services: TÜV NORD and TÜV NORD CERT joined forces with nine international partners to win the contract for a subsidy of roughly €5 million for the innovative AEROARMS research project in the context of the EU Horizon 2020 programme. This involves the development of a complex inspection system based on a flying robot with built-in gripping and assembly arms along with autonomous "testing crawlers". The idea is for these to be deployed in the future for the inspection and maintenance of pipelines and system components which are difficult to reach. For this purpose, a flying machine sets down a test robot. These testing crawlers, optionally equipped with magnetised wheels, test sensors (e.g. ultrasound) and cameras, inspect the component autonomously and send the data and images to the computer of the expert, who can then assess any damage to the material that may have been identified. This research project offers the Industrial Services business unit the possibility of developing innovative robotics-based testing methods which do not currently exist in this form.

TÜV NORD Systems and TÜV NORD SysTec have joined forces to develop a new method, based on a 3D printing procedure, for assessing the service life of damaged pipelines, which is generally difficult to estimate due to corrosion damage. So that the damage may be precisely assessed, a realistic, significantly scaled-down but faithful 3D model of the damaged pipeline section, based on the data delivered by the high-resolution inspection gauges used in every pipeline inspection, is created on a 3D printer using the laser melting procedure. The metallic 3D-printed model is then used for burst tests in the laboratory. The experimental results combined with the accompanying FEM simulations can then be used to draw conclusions about the actual performance of the damaged site. In comparison to the standard assessment procedure, this allows for the discovery of significant reserves in the pipeline's load-bearing capacity, with the consequence that the replacement of the damaged section of the pipeline can be planned significantly more effectively and implemented at lower cost.

Mobility: The trend toward digitalisation and automation in all vehicle systems continues. Automated driving is a particularly powerful driver of research. TÜV NORD Mobilität is also preparing for this new trend with a wide range of collaborations, innovations and business field expansions. The CAR-IT field at the IFM is being further expanded to satisfy the latest requirements in the area of functional

safety. Still under development is the SAVER project launched by TÜV NORD Mobilität, which, in collaboration with partners from industry, research and official bodies, will in the future focus on all aspects of type testing and approval for automated driving features. The trend in the field of mobile emissions measurement, PEMS, continues unabated and represents the future of exhaust gas measurement.

The vehicle valuations carried out by TÜV NORD Mobilität are generating only small amounts of revenue per unit. The significant order totals for large orders are accounted for by large numbers of up to 20,000 valuations per year and order type. With these orders, viability is achievable only with the use of digitised and automated processes. Moreover, car dealerships and workshops, alongside customers, are calling for digital interfaces. At TÜV NORD Mobilität, innovative order management systems and valuation systems have been created which make these processes and interfaces with the customer possible. Customer requirements are constantly changing, which means that rapid further development is always necessary. We are working closely with the in-house IT department but also with external partners. The performance of our IT partners is now indispensable to our business success in this area and represents a unique selling point which marks us out from our competitors.

Training: In the field of initial and further training, self-organised learning processes which are tailored to particular stages in life are becoming increasingly important. With the "Digital customer loyalty" project, the TÜV NORD Akademie is grasping the nettle of these developments and responding to the "new" customer needs. The aim is to use interactive tools to intensify customer dialogue and strengthen customer loyalty. Traditional face-to-face events are being supplemented by e-learning, thereby offering customers learning opportunities at a time and place to suit. The project is to be rounded off with the digitalisation of internal processes, in particular in communication with the customers.

The range of qualifications offered by TÜV NORD Bildung was augmented in 2015 with the addition of a new in-house learning platform which was installed in the company's server environment. TÜV NORD Bildung can conveniently create, administer and plan self-administered and self-determined learning contents and trainings and – where required – conduct final tests. With this learning management system, the complex processes involved in needs assessments and the distribution, acquisition and evaluation of knowledge with all tools can easily be managed. This modern e-learning solution is intended to optimise the company's own training and also to be offered as a product to other companies.

Natural Resources: In 2015, as before, the Natural Resources business unit executed extensive research and development orders for its customers in the context of research consortia with public funding and out of self-interest. More recent developments include, for example, technical innovations in cable-suspended shaft scanners or with regard to investigations into the feasibility of different energy storage technologies, safety research for the mining industry, and innovations in the field of coking technology concerning the leak-tightness and control of coke ovens. Particularly worthy of note is the successful commissioning of a pan-European expert consortium (KIC), with the participation of DMT as a core partner, with the task of establishing the KIC RawMaterials research and development consortium of the European Institute of Innovation & Technology. DMT is already participating with other partners in the consortium in innovation projects in the context of the EU's Horizon 2020 programme. These involve, for example, the development of new methods for the in-situ extraction of metals. The next steps will include participation in a coordination centre for the development of raw materials projects in Eastern and South-Eastern Europe, and innovative technology projects in collaboration with large European mining companies.

Moreover, in the context of the 2020plus strategy, further innovation projects based on innovation workshops and relating to the megatrends were developed and launched in 2015. The projects relate to the fields of geotechnical engineering, energy distribution and energy storage, new concepts for extraction and use in mining, nuclear waste repositories, guarantees of origin for raw materials, intelligent sensor networks, model engineering and process control in mining, and industrial process water purification.

Aerospace: In 2015, the big data Gateway project played an important role. In addition, ALTER TECHNOLOGY TÜV NORD is supporting customers and manufacturers in the development of new photovoltaic and semiconductor technologies, radiation procedures, cryptography and new technologies and testing methods for the industrial and civil use of drones. This is taking place in collaboration with local and European universities and research centres, other companies and governments.

IT: The need for digital transformation in almost all areas (Industry 4.0, smart home, smart cities, smart

energy, Car2X, autonomous driving etc.), which is meeting with increasing international recognition, is opening up new possibilities for the use of innovative information and communications technology. IT security is increasingly becoming a central factor in strategic implementation planning. Functional IT security can no longer be separated from IT security and is being recognised as a new customer requirement. It can be assumed that the need for consulting services in the field of IT security will continue to grow. The IT Security Act for Critical Infrastructure in Germany, adopted in 2015, enshrined in law for the first time a statutory obligation to demonstrate the implementation of IT security measures with appropriate audits. Continuous media reports of security incidents are also opening the door to new services, such as IT forensics. In addition to the manufacturer-specific product and system evaluation of security-critical components (CC evaluation), further requirements are being recognised for national authorisation and special IT security reviews to ward off the threat of espionage, and these requirements will necessitate the development of new services. Trends such as the use of big data to create profiles and predictions are confronting IT security with new challenges. Information and communications technology is thereby fulfilling its function as a support for the processes of many industries, including all the business units of the TÜV NORD GROUP.

Employees

As of December 31 the domestic and foreign companies of the TÜV NORD GROUP employed an average of 9,794 employees (converted to full-time equivalent) in comparison to 9,764 in the previous year.

Including the experts provided by the associations, the average number of full-time employees was 9,861 (2014: 9,840). On the sampling date of December 31 2015 the absolute number of employees was 12,652, and approximately 29 % of all employees in the group are women.

7,381 employees work in Germany. The number of employees abroad increased in 2015 to 2,480. The largest business unit is Industrial Services, with 5,084 employees at home and abroad, followed by the Mobility business unit, with 2,462 employees.

The TÜV NORD group is one of the top 100 employers for young professionals and students. Our group is an interesting and attractive employer in particular for engineering and natural sciences graduates.

The TÜV NORD GROUP was also singled out for further similar accolades from Kununu ("Top Company"), Focus ("TOP national employer 2015") and the award as "Hamburg's best employer 2015" from the Helmut-Schmidt-University Hamburg.

On the social networks, especially Facebook, TÜV NORD is also highly rated as an employer by its fans. Also bearing witness to our attractiveness as an employer is the year-on-year increase in the number of applications that we receive via our online applicant management system, taloom.

As an employer, we are the byword for open and authentic public communication. Which is why we have since 2012 been the proud bearer of the Kununu "Open Company" seal of quality.

The well-being of its employees is important to the group. From our group-wide staff surveys we received feedback on employee satisfaction. In May 2014 the TÜV NORD GROUP carried out its first ever global online employee survey, in which about 6,000 staff from 70 countries took part. The level of commitment of the group's staff, in other words, the degree to which the employees identify with their company, can safely be described as outstanding. There were, however, also numerous references to potential for improvement. These were taken into account in a follow-up process and a large number of improvement measures initiated by the TÜV NORD companies. The primary areas of attention were the "leadership and communication culture", "information and communication" and "cooperation". Thus it was that, in most of the business units, leadership development programmes were launched and concrete measures taken to improve communication (information on corporate strategy, improvements to the meeting structure, dialogue with senior management and directors). The intention is for a follow-up survey to be carried out.

As a technological services provider the lifelong training and development of our employees is important to us. The group boasts a very wide range of training options for employees, not to mention a strategy-oriented and expertise-based system of human resources development. In 2015, €6.4 million was spent on internal and external training events (2014: €7.4 million). The ultimate aim of managerial development, above and beyond enhancing the competitiveness and securing the future of the companies involved, is to use "good" management to increase the job satisfaction of the staff. The existing potential analysis procedures (Orientation Centre, Assessment Centre) were shaken up in 2014 and 2015 and aligned more effectively with the

needs of target groups such as junior and middle management. In the subsequent supporting programmes, the participants will be prepared for the various priorities of their future management tasks. Numerous management seminars and soft skills training sessions targeted to specific needs are being offered in the context of business-unit-specific manager development. For each manager there are both common and individual measures which are designed to develop key skills such as decision-making, strategic thinking, results-oriented action and goal-oriented management. Moreover, the participants are systematically linking up with one another to create a sustainable and high-performance network within the company.

The plan for the future is to offer these programmes across all the business units with the aim of guaranteeing a continuous supply of next-generation managers.

Regular dialogue is now taking place with the HR managers of the international companies with the aim of identifying and communicating best-practice approaches. Moreover, the talent management area is also offering the foreign companies direct on-site support in fields such as succession planning, the introduction of staff selection instruments and the organisation of sponsorship programmes.

The TÜV NORD GROUP offers attractive career opportunities for school-leavers. For instance, the group trains young talent as required for different positions. In addition to classical training for various professions, e.g. for office administrators or system integration specialists, a further way into the group for school students and young professionals is the path of combined study and professional experience (the dual curriculum). 47 trainees and 41 "dual" students are currently preparing for their careers.

The spectrum of occupations for which we offer training ranges from classic office work to technical professions. In this way the group also offers attractive career opportunities for school-leavers. With the integration of theory and practice, the students, who divide their time between study and the workplace, are being ideally groomed for future positions of responsibility in companies of the group. The particular focus here is on the technical and information technology field, for instance, on degrees in engineering or computer science. Various models of the training and this dual curriculum are being offered at many sites within Germany.

The TÜV NORD group has been sponsoring school students since 2014. The group offers scholarship students with migrant backgrounds the opportunity to discover their individual skills and interests, to expand existing talents and to test and consolidate them within projects. As a condition of the scholarship, the young people involved must demonstrate social commitment and good performance at school.

With the aid of interregional partnerships with academic institutes, we have since 2008 been sponsoring students from Germany and abroad. At the same time, by offering scholarships we are living up to our social responsibility: We provide assistance to many climbers up the educational ladder and students in degree courses which involve responsibility to society as a whole. Our partners in this endeavour include the Leibniz Universität in Hanover, the University of Applied Science and Arts Hanover, the Technical University of Hamburg Harburg and the Technical University of Dresden. As an international group of companies we also award an international scholarship for foreign holders of bachelor degrees with initial professional experience in collaboration with the Northern Institute of Technology Management (NIT) at the Technical University of Hamburg Harburg.

Another way in offered by the TÜV NORD GROUP alongside training, dual study or work as a "jobbing" student is the group's graduate programme for trainees. This can be tailored to meet individual needs and offers the opportunity to get to know the group internationally and/or across various disciplines over a period of twelve months.

The group considers a good work-life balance to be an important factor in ensuring the top performance of its employees. Anyone who wants to be successful professionally needs backing from their family. We do more than just pay lip service to the compatibility of work and family. TÜV NORD AG and many of its subsidiaries have already been certified according to the "berufundfamilie" ("work and family") audit, and more certifications will follow.

Flexible working hours and the possibility of part-time work help promote the cause of happy family life. If staff members are confronted with particular challenges in the care of children or elderly relatives, an external service provider is on hand to offer advice. For children there are holiday programmes and care facilities for nursery-age children. Operational health and safety management lays on a wide range of seminars in addition to a health week and offers an eye school, health coaching, medical check-ups and a stress test. Various sporting activities are offered at many of the sites.

For our companies it is particularly important to cultivate a culture that reinforces a high level of mutual loyalty between employees and companies. One way of measuring this is length of service life. Throughout the group this averages over ten years, a figure which is significantly higher than comparable statistics from the competition.

The Board of Management would like to thank all the staff and company managers, both at home and abroad. The success achieved in the fiscal year under review would have been impossible without their commitment and dedication to their work. Our thanks also go out to the employee representatives for their trusting and constructive cooperation.

Overall situation

In view of the macroeconomic situation, we are generally satisfied with the way the year under review progressed. However, notwithstanding the highest operating profit since the founding of the TÜV NORD group, we are having to work with cost reduction programmes and other measures to improve our profitability and continuously enhance our position in terms of our earnings, assets and finances. It is our assumption that the earnings, asset and financial position will remain stable in the future.

Subsequent events

No events of particular significance which materially affect the group's business performance have occurred since the end of the fiscal year.

REPORT ON EXPECTED DEVELOPMENTS, OPPORTUNITIES AND RISKS

Report on expected developments

Leading German economic research institutes assume that economic development will be muted in Germany in 2016. The TIC sector expects a challenging fiscal year in 2016. The global market for TIC activities will continue to grow as the demand for quality assurance remains strong. In a globalised world, in which the division of labour is becoming ever more pronounced, the demand is growing for neutral, independent and expert testing, surveying and certification services. The interest in quality audits, such as the testing of food and IT security, is proving a particularly strong growth factor. This is complemented by an increasing trend in companies toward the outsourcing of complex testing procedures. On the other hand, the highly fragmented nature of the industry means that competition is fierce. Rapidly advancing global digitalisation will have an impact on the services of the group. We expect robust growth in the plant and industry field as well as in the processing sector. The monetary policy of the European Central Bank remains expansionary. This should also continue to support growth. However, the outlook remains uncertain. Negative effects might potentially be generated by the persistent weakness of the natural resources markets and geopolitical tensions.

In the light of the current political and economic challenges, the TÜV NORD GROUP anticipates slight growth in sales in the fiscal year 2016. This does not take into account possible effects from the acquisition and sale of companies. All business units, with the exception of the Training business unit, are expected to contribute to the planned growth rates.

The Industrial Services business unit assumes that growth will be stable both domestically and abroad. In international business, the Europe, Southeast Asia and China regions are likely to make a particular contribution to the increase in sales. At the same time, we expect a decline in the nuclear business in Europe.

The Mobility business unit expects to see an increase in sales based essentially on the optimisation and further development of existing services in current and new markets, both at home and abroad. It will push on unstintingly with the internationalisation process.

Several projects for the realisation of market potential are currently being implemented in cooperation with foreign subsidiaries (e.g. in China).

A decline in sales is expected in the Training business unit due to the closure of a vocational college in 2015 and the termination of the Opel transfer contract. Work will continue to stabilise TÜV NORD Bildung. A further plan is to use improved and more rapid product development to bring about enhanced market penetration in the free market sector, e.g. in the meetings and conferences segment. The aim is also to expand the sponsored training field, in particular in the area of retraining and qualification (training vouchers).

In the Natural Resources business unit, a growth in revenue and an increase in profit, to which all the business fields are expected to contribute, are anticipated in the wake of successful restructuring. After a protracted period of weakness, stabilisation, albeit at a low level, could take place in the commodities markets in the fiscal year 2016. At the

same time, the business unit is striving to reduce its dependency on the commodities markets by shifting business activities into other markets.

The Aerospace business unit is banking on growth in sales and profit due to the continuing recovery of the European aerospace market and new services in the BRIC countries. The expansion of services, e.g. in the material technologies area, improved market penetration in the field of component testing in Europe, and the consolidation of its technological position in existing fields of activity will contribute significantly to the expected growth.

The expectation in the IT business unit is that it will continue to follow its chosen path to growth, with increases in revenue in all areas of the portfolio. Alongside the known growth areas such as hardware and software evaluation, cyber security and the physical verification of data centres (TSI), the expansion of the existing sales concept continues to be a central theme. A further intention is to systematically roll out the service portfolio of the IT business unit in selected countries with the participation of the foreign TÜV NORD companies.

With regard to earnings we expect to see moderate growth in 2016, which is likely to be supported, among other things, by improvements in the revenue situation of the individual companies in the wake of earnings improvement programmes – to be precise, in the Training, Natural Resources and Industrial Services business units abroad – and as a result of the expected effects from the cost optimisation programmes. The plan for 2016 is for all the business units to generate positive results. The goal is to achieve positive consolidated results slightly in excess of the operational level of the 2015 fiscal year.

The number of employees is expected to grow in 2016. The objective of human resources development is stabilisation and the further enhancement of productivity.

The innovation projects identified in the context of the strategy 2020plus should contribute to the organic growth of the group. These projects will be continued in 2016 with the aim of sustainably increasing the share of new services. In their innovation projects, all the business units are engaging with global megatrends such as Industry 4.0, the Internet of Things, critical infrastructure and connected cars, with the aim of adopting these developments in innovative and profitable business models.

Risk and opportunity management system

Systematic risk and opportunity management is integral to our corporate governance. The TÜV NORD group recognises and exploits its opportunities at an early stage without losing sight of the risks. This allows us to act appropriately and initiate any necessary measures in good time. In its corporate actions, the TÜV NORD GROUP is exposed to various opportunities and risks. Our risk and opportunity management system helps us to identify and assess these early on. The Board of Management and the Supervisory Board are kept regularly informed of the current risk situation of the group and the individual business units.

Opportunities are identified and analysed within the risk and opportunity management system. To this end, market and competition data are also evaluated. On this basis we measure, assess and review our sales and service activities and other measures in respect of their effectiveness and viability. We constantly monitor our markets and can therefore identify any macroeconomic and industry-specific opportunities at an early stage. An intense and wide-ranging focus on both established and emerging markets is opening up macroeconomic opportunities for the TÜV NORD group. Undaunted by the difficulties presented by current global market conditions, we aspire to exploit any opportunity that may arise. We are consistently augmenting our innovative power and reinforcing our technological position in the relevant markets and industries to create a reliable basis for our market position. We are thus in the position to participate at an early stage in macroeconomic opportunities as soon as the chance arises to do so.

We use our risk management system to identify and manage risks to the future development of the TÜV NORD group.

The objectives of the risk management system are the complete and reliable identification of existing risk potentials throughout the group, comprehensive risk summaries and evaluations, the quest for and development of efficient measures to reduce risk, continuous risk monitoring and comprehensive risk reporting.

The strategy of the existing risk management system consists in the group-wide systematic identification, evaluation, aggregation, monitoring and notification of the existing risks and implementation of the corresponding measures for risk reduction or elimination in all the companies in which the TÜV NORD GROUP holds a majority stake. These risks are identified each quarter in all the business units in a standard-

ised, IT-based, periodic process. The identified risks are analysed and evaluated, taking into account the potential levels of damage and likelihood of occurrence, so that countermeasures for risk mitigation or elimination can be coordinated or developed to complement existing measures. On the basis of the risks that continue to exist after the implementation of countermeasures, a report is sent to the risk management department of the TÜV NORD GROUP.

Crucial risks that might jeopardise the very existence of the group are reported immediately in the form of ad-hoc warnings outside the regular reporting schedule.

The risk management system is structured to ensure that we can determine the individual risks and their impact on the group in order to accurately map the overall risk situation of the group.

Where necessary, financial provision is made for the risks arising from the different areas. Moreover, the TÜV NORD group operates a centralised insurance management system which sets out and implements a group-wide insurance strategy. Insurance contracts are in place to limit or completely eliminate the possible financial impact of potential claims or liability risks.

The Board of Management and the Supervisory Board are kept informed at regular intervals of the current risk situation of the group and the individual business units. They discuss at length the causes of the current risk situation and the measures taken in response to it.

In addition, the effectiveness of the risk management system is verified by the corporate audit department and external auditors. The results of these audits are regularly reported to the Board of Management and the Supervisory Board.

Risks and Opportunities for the TÜV NORD group

For a global technology service provider such as the TÜV NORD group, a wide range of risks and opportunities are inextricably linked with its entrepreneurial activities. Opportunities arise out of the group's presence in growth sectors and dynamic markets. Investment in innovative business areas in Germany and abroad gives the opportunity to react to the intensifying pressure of competition and to strengthen the company's market position.

No risks became apparent during the 2015 fiscal year which might individually or cumulatively jeopardise the company's continued existence or materially impair its financial position, financial performance or earnings. Nor is there any threat for the foreseeable future of any risks arising that might jeopardise the company's continued existence.

Interest rate risks can arise in connection with pension obligations. The plan assets intended to finance the pension obligations are managed in a fiduciary capacity by the TÜV NORD PENSION TRUST e. V., which was founded in 2008. Changes to the technical interest rate in the valuation of pension obligations can lead to corresponding impacts on the present value of the discounted obligations and thus exert significant influence on the equity capital and the overall result.

The group is not exposed to any material price, credit loss or liquidity risks, nor to risks arising from fluctuations in cash flow. The group's financial assets are invested in such a way that, as far as can be seen at present, no material risks exist.

The individual business units report the following risks and opportunities in their business activities:

The Industrial Services business unit expects its business to continue to show a positive development in the coming years. The risks and opportunities that are likely to exert a material influence on the way business proceeds may be summed up as follows:

The business unit is exposed to risks above all in its core market, Europe. Intense price competition, in tandem with equally intense competition with regard to the recruiting of staff, especially engineers, may have a negative impact on the achievement of its objectives. Furthermore, there is a real risk in Germany that regulations will be amended with the effect that previously mandatory tests will no longer be required and that other specialist companies will be granted permission to conduct tests alongside the experts currently charged with the responsibility for doing so. This would result in a decline in revenue and earnings as well as in increased competition. There are opportunities for the expansion of business through the introduction of new services and the extension of existing ones (e.g. in the field of of wind energy or food-stuffs) as well as through the geographical expansion of activities throughout the world. Moreover, there is still room for measures to be implemented that will further enhance the efficiency with which services can be provided. The digitalisation of services offers an opportunity to mitigate the skill shortage threat posed by demographic developments.

As a result of the amendment of the Atomic Energy Act in 2011, the nuclear companies are confront-

ed with the medium- to long-term risk of declining orders in Germany. Opportunities are presented by activities in the domestic decommissioning and waste management market and, in the long term, in connection with final nuclear waste disposal, and by the reinforcement of sales activities abroad. Services outside the nuclear field will be exploited more intensively and advanced through collaboration with other TÜV NORD companies.

In the certification business, changes to the statutory basis mean that there is always the possibility that individual services will become obsolete or be cut back. However, due to the high level of diversification and the heterogeneity of the customer structure, this risk is manageable. The risk remains that accreditation bodies will impose drastic sanctions, up to and including the revocation of accreditation for certain areas, in the event of violations of the rules by individual employees of the certification company. Due, on the one hand, to the growing international trade in goods and, on the other, to the increasing importance of consumer protection, the domestic and foreign markets for almost all certifications are set to undergo robust growth over the medium to long term. Opportunities will arise through process optimisation and investments in the areas of energy and consumer protection. The anticipated positive trend might be affected by risks arising from changes to the local political, social and economic conditions in some countries.

The Mobility business unit is faced with stronger competition – in particular on the German market. Due to the use of the same core brand there is inter-brand competition between the TÜV organisations. Takeovers and mergers in the car dealership and workshop sector are resulting in ever increasing numbers of transregional and nationwide car dealership groups and chains. The need for comprehensive service bundles and the national provision of services is increasing in lockstep with this development. The increasing digitalisation of car dealerships and workshops is leading to more stringent requirements with regard to the processes of the testing service providers. Technological developments in the automotive industry and global efforts to reduce pollution are leading to a greater diversity of propulsion concepts. The VW exhaust scandal uncovered in the year 2015 could lead to changes in the type approval process – with opportunities and risks for the Mobility business unit. Procedures for the calibration of brake test benches and light adjusting equipment, especially in car dealerships and workshops, are currently being discussed and developed. The Mobility business unit is actively participating in this discussion with the aim of establishing legal certainty with regard to the related accreditation issues. Associated with the technological developments is an increased global demand throughout the automotive industry for support in vehicle development and the homologation of automotive components. Information technology is an essential ingredient in modern vehicle construction. This is generating completely new demands on data security systems and methods of verification and control. As a long-standing development partner, TÜV NORD Mobilität boasts the knowledge and methods needed for the verification of electronic systems installed in vehicles and can simulate their interactions with each other. With a view to the development of autonomous driving, the safety and reliability of vehicle electronics is acquiring a whole new level of significance. In the automotive growth markets, such as China, the used-car market is surging, and with it the interest in neutral and independent used car evaluations. In a manner specifically adapted to country-specific circumstances, TÜV NORD Mobilität is collaborating with the local TÜV NORD companies to develop new business models for the implementation of used car evaluations. The TÜV NORD brand represents real added value and is generating confidence and facilitating market entry.

For the companies of the Training business unit, falling unemployment could give rise to risks in the coming years, as it may lead to a substantial reduction in the number of contracts for training measures financed from public funds. The companies intend to extend their portfolios of services for the free market, e.g. for the health and nursing services sector. Opportunities to improve the market position are to be found in the expansion of free market business activities. The "migration and refugees" issue is creating new challenges for the education and labour market policy. The educational institutes are accordingly being forced into a prominent role in the development and provision of suitable instruments. In response to the current political situation, the federal employment agency has launched a new language programme for refugees. This will result in opportunities for the companies in the Training business unit.

In the Natural Resources business unit, the continuing disinclination to invest in the international commodities markets and the high level of competitive pressure are just two of the significant risks. Restructuring measures are leading to a clearer focus on service provision. Medium-term growth opportunities are mainly to be found abroad and consist in the expansion of the international network of branches and inorganic growth through corporate acquisitions.

The companies of the Aerospace business unit are dependent upon successful partnership with the component manufacturers. In the growing market for satellite construction there is a risk that the component manufacturers may enter into direct business relationships with the builders of satellites or systems. Prospects for business expansion are also offered by increased growth in emerging markets as well as the extension of existing services and the marketing of these services for the aviation sector.

For the IT business unit, risks are arising from German and European policy. The current challenges of coping with the influx of refugees have come to utterly dominate policymaking, robbing IT security of its former priority status. There has, however, been no let-up in the trend toward the assertion of national sovereignty in the public authority sphere that has been triggered by the NSA scandal and the resulting distrust of foreign, particularly Chinese and Russian but also American products. The fact that proprietary national developments have little prospect of prevailing against the innovative advantage enjoyed by international market leaders is meeting with ever more widespread recognition, meaning that this risk has thus far not increased to any extent worthy of note. New opportunities are arising in the context of safety evaluations for the international manufacturers for deployments in national markets. Enhanced awareness of the importance of security in the forthcoming development and implementation of innovative core themes such as Industry 4.0, smart-X and Car2X could lead to increased demand for IT security services, for instance for official bodies and in all industrial sectors. Opportunities will arise as a result of the fact that, in its strategic innovation policy, the German government is with its smart grids and electric vehicles forcing the pace with regard to issues such as Industry 4.0, critical (IT) infrastructure, and the energy transition. The EU basic data protection regulation for a uniform level of data protection in Europe becomes mandatory in June 2016 for all European States, and the German IT security act was ratified in 2015. The development of a cyber-safety strategy at EU level is still under discussion. The main issues for the future are set to be the development and dissemination of chip card technology, cryptography, DE-mail, secure end-to-end encryption, and trusted hardware and software.

Corporate governance

Corporate governance provides the framework for the management and supervision of the TÜV NORD GROUP. It is the byword for responsible management and control with the aim of long-term value creation. Corporate governance ensures the regularity of all the business processes and organisational structures of the group.

To prevent possible risks and avert damage to the TÜV NORD GROUP, the Board of Management has set up a central compliance management system in TÜV NORD AG with a Compliance point of contact to coordinate compliance issues and tasks. The point of contact is available for all employees. Appropriately conceived and clearly formulated policies and regulations, accessible to all staff at all times via the Intranet, are fundamental factors in ensuring good corporate governance. The adoption of a corporate philosophy and a binding code of conduct has given employees a concrete framework of guidelines for their actions, thus reinforcing business practices which are in compliance with the law. The corporate philosophy and the code of conduct are regularly reviewed and updated. Information events and training sessions are organised in order to enhance staff awareness of the compliance issue.

The appointment of an ombudsman represents a further way of drawing attention to violations of the compliance regulations of the TÜV NORD GROUP. A renowned lawyer as external point of contact for all employees, customers and business partners will gather information on violations of the law or policy.

Compliance with the corporate governance rules and regulations is continually monitored by the Internal Audit Department through its risk-orientated audit planning. The efficiency and effectiveness of the Corporate Audit Department are regularly confirmed in accordance with the DIIR standard by an external quality assessment.

In the fiscal year 2015 the compliance management system was successfully audited by an external audit company on the basis of the IDW PS 980 auditing standard. The audit report deemed the implementation and orientation of the compliance management system to be appropriate. The verdict of the audit confirms with sufficient confidence that the compliance management system is suitable for both the identification of risks of major violations of the rules and the prevention of such violations in the first place.

The audit concentrated on the following areas

- Maintaining the confidence of the customers in the expertise and integrity of the TÜV NORD GROUP, its executive bodies and employees,

- Ensuring strict compliance with all accreditation requirements and recognition rules and the related conditions and organisational regulations,

- The avoidance of corruption or activities bordering on corruption, such as reports, tests or certifications biased in favour of the organisation being tested, as instances of violation of compliance that particularly jeopardise trust, and

- Ensuring an adequate level of data protection.

This review is another successful measure in the ongoing campaign to safeguard the efficiency and effectiveness of the compliance management system in the TÜV NORD GROUP. In addition, compliance audits are regularly held in all areas by the on-site Internal Audit Department. Risk-based process controls, such as, for instance, a compliance check for business partners, are systematically reducing potential compliance risks. The tracking, sanctioning, evaluation and documentation of breaches of compliance represent an integral part of the continuous improvement process. In addition to the continuous supply of up-to-date information to the Board of Management, the group's compliance contact presents a compliance report twice a year. These measures will further strengthen the tried-and-tested compliance structures and permanently reinforce awareness of the mandatory nature of TÜV NORD compliance in the group's day-to-day business.

STATEMENT ON CORPORATE GOVERNANCE

Findings on the promotion of the participation of women in leadership positions according to Article 76 (4) and Article 111 (5) German Stock Corporation Act

The TÜV NORD GROUP pursues a strategy of diversity and is striving to increase the percentage of women in managerial positions. The act on the equal participation of women and men in managerial positions in the private and public sectors of May 2015 committed certain companies in Germany for the first time to define targets for the proportion of women on their supervisory boards, executive boards and the next two management tiers and to set a date for the achievement of these targets. The companies concerned must decide on their targets and deadlines for implementation by September 30 2015. The initial implementation deadline set in the process may not by law be later than June 30 2017. The next deadline for implementation can be up to five years.

At its meeting on September 8 2015 the Supervisory Board of TÜV NORD AG resolved on the following target for the proportion of women in the Supervisory Board and the implementation of said target:

"The Supervisory Board currently consists of eighteen male and two female members. The current composition of the Supervisory Board ensures that the Supervisory Board can properly perform its duties. For this reason, no change to the composition of the Board and, therefore, no increase in the number of women is to be sought in the period up to the end of June 30 2017. Should any subsequent appointments become necessary, women will, as always, be offered the same opportunities as men."

At its meeting on September 8 2015 the Supervisory Board of TÜV NORD AG resolved on the following target for the proportion of women in the Board of Management and for the implementation of said target:

"The Board of Management currently consists of five male members. The appointment of one or more female members to the Board will not actively be pursued by the end of June 30 2017. Should any subsequent appointments become necessary, women will, as always, be offered the same opportunities as men."

For the first tier of management below the Board of Management, the Board set a target of 22% and a deadline for implementation of the end of June 30 2017. The target for the first tier of management maintains the status quo. For the second tier of management below the Board of Management, the Board set a target of 30% and a deadline for implementation by the end of June 30 2017. As the proportion of women in managerial positions in this management tier currently exceeds 30%, the target set of 30% was permissible.

The adopted targets do not of course exclude a higher increase in the proportion of women. The deadline for implementation takes full advantage of the permitted time allowed for the initial definition of the implementation period.

For the other affected companies in the TÜV NORD group, the targets for the proportion of women in the Supervisory Board, the Board of Management and the next two tiers of management and implementation deadlines were set in a timely manner by September 30 2015.

Further information

In view of the fact that their Boards of Management and Supervisory Boards are in part composed of identical persons, TÜV NORD AG is deemed to be directly dependent within the meaning of Sec. 17 of the Stock Corporations Act (Aktiengesetz – AktG) upon TÜV Nord Holding GmbH & Co. KG of Hamburg and TÜV HSA Holding GmbH & Co. KG of Hanover, and indirectly dependent upon TÜV Nord e. V. and TÜV Hannover/Sachsen-Anhalt e. V. For the period from January 1 to December 31 2015 and in respect of relevant special transactions during the 2015 fiscal year, the Board of Management of TÜV NORD AG has drawn up a report pursuant to Sec. 312 of the AktG regarding relations between the company on the one hand and TÜV Nord Holding GmbH & Co. KG, TÜV HSA Holding GmbH & Co. KG, TÜV Nord e. V., TÜV Hannover/Sachsen-Anhalt e. V. and the affiliated companies on the other.

This report ends with the following declaration:

"We hereby declare that, in respect of every legal transaction with affiliates, TÜV NORD AG received consideration that was appropriate in the light of the circumstances known to us at the time when such transactions were performed.

Beyond the activities reported on herein, there were no further reportable transactions, measures or omissions."

Hanover, February 29 2016

TÜV NORD AG
The Board of Management

CONSOLIDATED INCOME STATEMENT

€ k	Note	2015	2014
Revenue	3.1.	1,116,569	1,089,493
Change in inventories of finished goods and work in progress		4,404	-1,642
Other internally generated additions to assets		359	58
Other operating income	3.2.	93,490	41,438
Cost of materials	3.3.	-198,179	-179,989
Personnel expense	3.4.		
a) Wages and salaries		-558,064	-524,379
b) Social security contributions, post-employment and welfare benefits		-161,688	-139,050
Depreciation, amortisation and impairment losses	3.5.	-33,699	-32,231
Other operating expense	3.6.	-209,718	-204,726
Operating profit		**53,474**	**48,972**
Income from investments in associates		1,358	709
Income from other equity investments		59	193
Interest income		1,979	1,595
Interest expense		-1,841	-1,996
Other financial items		-208	-235
Financial items	**3.7.**	**1,347**	**266**
EBT (Earnings before tax)		**54,821**	**49,238**
Taxes on income	3.8.		
a) Current tax expense		-20,156	-20,009
b) Deferred tax income		-736	153
Consolidated earnings after tax		**33,929**	**29,382**
The consolidated earnings after tax are attributable to			
owners of TÜV NORD AG		31,401	27,429
non-controlling interests		2,528	1,953

STATEMENT OF COMPREHENSIVE INCOME

€ k	2015	2014
Consolidated earnings after tax	**33,929**	**29,382**
Items that will not be reclassified subsequently to the Income Statement		
Actuarial gains and losses		
Changes from unrealised gains and losses[1)]	-91,491	-102,891
Taxes	28,437	31,734
Total items that will not be reclassified subsequently to the Income Statement	**-63,054**	**-71,157**
Items that will be reclassified subsequently to the Income Statement		
Financial assets available for sale		
Changes from unrealised gains and losses	153	-37
Total Financial assets available for sale	**153**	**-37**
Currency translation		
Changes from unrealised gains and losses	638	2,330
Total Currency translation	**638**	**2,330**
Total items that will be reclassified subsequently to the Income Statement	**791**	**2,293**
Other comprehensive income	**-62,263**	**-68,864**
Total comprehensive income	**-28,334**	**-39,482**
Of which attributable to		
owners of TÜV NORD AG	-29,908	-40,586
non-controlling interests	1,574	1,104

1) Including non-controlling interests amounting to €-1,365 k (2014: €-1,837 k).

CONSOLIDATED BALANCE SHEET

ASSETS	Note	31.12.2015	31.12.2014
€ k			
A. NON-CURRENT ASSETS			
Intangible assets	5.1.	81,957	82,921
Property, plant and equipment	5.2.	220,153	210,704
Equity-accounted investments	5.3.	7,450	6,017
Other financial assets	5.4.	43,003	55,700
Trade and other receivables	5.6.	389	209
Other assets	5.7.	4,416	3,912
Deferred tax assets	3.8.	156,863	128,560
TOTAL NON-CURRENT ASSETS		**514,231**	**488,023**
B. CURRENT ASSETS			
Inventories	5.5.	65,807	61,198
Trade and other receivables	5.6.	165,397	143,433
Other assets	5.7.	16,733	15,549
Current tax assets		4,260	4,665
Cash and cash equivalents	5.8.	84,277	61,607
TOTAL CURRENT ASSETS		**336,474**	**286,452**
C. ASSETS HELD FOR SALE	**5.9.**	**1,181**	**2,099**
TOTAL ASSETS		**851,886**	**776,574**

EQUITY AND LIABILITIES	Note	31.12.2015	31.12.2014
€ k			
A. EQUITY			
Subscribed capital	5.10.	10,000	10,000
Capital reserves	5.10.	114,413	114,413
Subordinated registered debenture	5.10.	50,000	20,000
Retained earnings	5.10.	87,958	57,516
Other equity items	5.10.	-170,981	-109,672
Non-controlling interests	5.10.	9,577	8,511
TOTAL EQUITY		**100,967**	**100,768**
B. NON-CURRENT LIABILITIES AND PROVISONS			
Provisions for pensions and other post-employment benefits	5.11.	424,717	358,158
Other provisions	5.12.	45,175	47,226
Financial liabilities	5.13.	715	727
Trade and other payables	5.13.	12,755	19,059
Deferred tax liabilities	3.8.	11,807	11,226
Other liabilities	5.13.	21	52
TOTAL NON-CURRENT LIABILITIES AND PROVISONS		**495,190**	**436,448**
C. CURRENT LIABILITIES AND PROVISONS			
Provisions	5.12.	51,111	49,643
Financial liabilities	5.13.	276	21,447
Trade and other payables	5.13.	114,868	94,457
Current tax liabilities		11,273	9,745
Other liabilities	5.13.	78,201	64,065
TOTAL CURRENT LIABILITIES AND PROVISONS		**255,729**	**239,358**
TOTAL EQUITY AND LIABILTIES		**851,886**	**776,574**

CONSOLIDATED CASH FLOW STATEMENT

€ k	Note	2015	2014
Consolidated earnings after tax		33,929	29,382
Adjustments to take account of non-cash transactions			
Depreciation of property, plant and equipment and amortisation of intangible assets		33,699	32,231
Amortisation of financial assets		208	235
Pension expense		-5,194	5,175
Cash flow		**62,642**	**67,023**
Appropriation of profits of associates		-1,088	-356
Interest income/expense		-138	401
Changes in deferred tax assets and liabilities recognised as income or expense		737	-153
Loss/gain on disposal of intangible assets and property, plant and equipment		-277	-6
Changes in inventories, receivables and other assets		-26,379	7,976
Changes in payables, other provisions and other liabilities		47,715	5,750
Income taxes paid		-15,277	-12,019
Cash flow from operating activities	**6.**	**67,935**	**68,616**
Receipts from disposals of intangible assets		192	20
Receipts from disposals of property, plant and equipment		1,587	822
Receipts from disposals of other financial assets		42,032	40,142
Payments for investments in intangible assets		-3,317	-2,245
Payments for investments in property, plant and equipment		-38,746	-28,859
Payments for investments in other financial assets		-54,870	-59,877
Acquisitions of consolidated companies		-1,599	69
Cash flow from investment activities	**6.**	**-54,721**	**-49,928**
Receipts from financial resources		30,000	20,944
Interest received		2,082	1,331
Dividends to owners and non-controlling shareholders		-804	-1,759
Payments for the amortisation of loans		-21,506	-31,266
Interest paid		-1,092	-1,458
Cash flow from financing activities	**6.**	**8,680**	**-12,208**
Net change in cash and cash equivalents through payments made and received		**21,894**	**6,480**
Net change in cash and cash equivalents through changes in exchange rates and in the basis of consolidation		776	1,121
Cash and cash equivalents at the beginning of the period		**61,607**	**54,006**
Cash and cash equivalents at the end of the period		**84,277**	**61,607**
Supplementary information:			
Receipts from dividends included in cash flow from operating activities		329	546

STATEMENT OF CHANGES IN CONSOLIDATED EQUITY

€ k	Subscribed capital	Capital reserves	Subordinated registered debenture	Retained earnings	
Carrying amounts as of January 1 2014	**10,000**	**115,332**	**0**	**29,127**	
Comprehensive income	0	0	0	27.429	
Removal/Allocation	0	-919	0	919	
Payment from subordinated registered debenture	0	0	20.000	0	
Dividend payment	0	0	0	-1.000	
Changes in basis of consolidation	0	0	0	0	
Other changes	0	0	0	1.041	
Carrying amounts as of December 31 2014	**10,000**	**114,413**	**20,000**	**57,516**	
Carrying amounts as of January 1 2015	**10,000**	**114,413**	**20,000**	**57,516**	
Comprehensive income	0	0	0	31,401	
Transfer from/to	0	0	0	0	
Payment from subordinated registered debenture	0	0	30,000	0	
Dividend payment	0	0	0	0	
Changes in basis of consolidation	0	0	0	-103	
Other changes	0	0	0	-856	
Carrying amounts as of December 31 2015	**10,000**	**114,413**	**50,000**	**87,958**	

	Accumulated Other Comprehensive Income					
	Currency translation differences	Financial assets held for sale	Actuarial gains and losses	Share of TÜV NORD AG's owners	Non-controlling interests	Consolidated equity
	-3,873	**-146**	**-37,638**	**112,802**	**7,721**	**120,523**
	1.908	-37	-69,886	-40,586	1,104	-39,482
	0	0	0	0	0	0
	0	0	0	20,000	0	20,000
	0	0	0	-1,000	-759	-1,759
	0	0	0	0	445	445
	0	0	0	1,041	0	1,041
	-1,965	**-183**	**-107,524**	**92,257**	**8,511**	**100,768**
	-1,965	**-183**	**-107,524**	**92,257**	**8,511**	**100,768**
	638	153	-62,100	-29,908	1,574	-28,334
	0	0	0	0	0	0
	0	0	0	30,000	0	30,000
	0	0	0	0	-804	-804
	0	0	0	-103	0	-103
	0	0	0	-856	296	-560
	-1,327	**-30**	**-169,624**	**91,390**	**9,577**	**100,967**

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS FOR THE 2015 FISCAL YEAR

1. General principles

1.1. Corporate information

The TÜV NORD group is one of the biggest technical service providers in Germany, offering a broad range of testing, certification, engineering, consulting and training services for its customers in its Industrial Services, Mobility, Training, Natural Resources, Aerospace and IT business units in more than 70 countries all over the world.

TÜV NORD AG, with its registered office in Hanover, Germany, is the parent company of the group, registered with the commercial registry of Hanover Local Court under no. HRB 200158.

The Board of Management of TÜV NORD AG completed the preparation of the Consolidated Financial Statements as of December 31 2015 and the Group Management Report for the 2015 fiscal year on February 29 2016, and authorised them for submission to the Supervisory Board.

1.2. Basis of presentation

Taking advantage of the right of election pursuant to Art. 315a (3) of the German Commercial Code (HGB), TÜV NORD AG prepared its Consolidated Financial Statements as of December 31 2015 in accordance with International Financial Reporting Standards (IFRS), while at the same time complying with the German supplementary provisions pursuant to Art. 315a (1) of the HGB. All the International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) adopted by the International Accounting Standards Board (IASB) up to December 31 2015 and all the pronouncements of the International Financial Reporting Standards Interpretations Committee (IFRS IC) have been applied in relation to the 2015 fiscal year, to the extent that such standards had received the endorsement of the Commission of the European Union up to the time of publication of the Consolidated Financial Statements and that their application is mandatory. The use of the two-statement approach shows a breakdown of the expense recognised in equity and income (Income Statement) in addition to the Profit and Loss Account, the Balance Sheet and the Cash Flow Statement.

In order to achieve equivalence with consolidated financial statements prepared in accordance with the HGB, all statutory requirements of disclosure and explanation going beyond the IASB requirements have been complied with, in particular the preparation of a Group Management Report.

The Consolidated Financial Statements are presented in euro and on the basis of original cost (costs of purchase or production), with the exception of certain financial instruments which are recognised at fair value. Unless otherwise indicated, the amounts are stated in thousands of euro (€ k). For the sake of clarity and to make the financial statements more readily understandable, certain individual items are aggregated in the Balance Sheet and the Income Statement but disclosed and explained separately in the notes.

The Consolidated Financial Statements are based on the consolidated accounts. Separate financial statements of subsidiary companies prepared in their local currencies are translated into euro.

The reporting periods of the TÜV NORD group and of all consolidated subsidiaries end on December 31 in each successive calendar year.

1.3. Accounting standards applied for the first time in the year under review

The IASB has issued the following standards and amendments to existing standards, which have received endorsement from the EU, i.e. have been adopted into European law, and whose application is mandatory in respect of the 2015 fiscal year:

Effective Application Standard / Interpretation	**Mandatory application**
IFRIC 21: "Levies"	Reporting periods beginning on or after 17.6.2014
Annual Improvements to IFRSs 2011 – 2013 (issued 12.12.2013)	Reporting periods beginning on or after 1.1.2015

All the accounting standards whose application is mandatory as of the 2015 fiscal year have been applied by TÜV NORD AG; this has not, however, had any material impact on the presentation of the financial statements.

No elective application in advance Standard / Interpretation	**Mandatory application**
IAS 19 (amendments): "Defined Benefit Plans: Employee Contributions"	Reporting periods beginning on or after 1.2.2015
Annual Improvements to IFRSs 2010 – 2012 (issued 12.12.2013)	Reporting periods beginning on or after 1.2.2015
IFRS 11 (amendments): "Accounting for Acquisitions of Interests in Joint Operations"	Reporting periods beginning on or after 1.1.2016
IAS 16, 38 (amendments): "Clarification of Acceptable Methods of Depreciation and Amortisation"	Reporting periods beginning on or after 1.1.2016
IAS 1 (amendments): "Disclosure Initiative"	Reporting periods beginning on or after 1.1.2016
IAS 16, 41 (amendments): "Bearer Plants"	Reporting periods beginning on or after 1.1.2016
IAS 27 (amendments): "Equity Method in Separate Financial Statements"	Reporting periods beginning on or after 1.1.2016
Annual Improvements to IFRSs 2012 – 2014 (issued 25.9.2014)	Reporting periods beginning on or after 1.1.2016

1.4. Newly issued accounting standards not yet applied

The following standards, interpretations and amendments to existing standards issued by the IASB have already been adopted into European law by the EU, but their application is not yet mandatory for the year under review. The company has not elected to apply this provision in advance of its becoming mandatory.

TÜV NORD AG is of the opinion that the application of this standard, which was issued before the reporting date but whose application is not yet mandatory, will have no material consequences for its financial position or financial performance.

The following standards and amendments to existing standards issued by the IASB or the IFRS IC have not yet received EU endorsement, with the effect that their application is not yet admissible:

Application in advance inadmissible Standard / Interpretation	Mandatory application
IFRS 9: "Financial Instruments"	Reporting periods beginning on or after 1.1.2018
IFRS 10, 12, IAS 28 (amendments): "Investment Entities: Applying the Consolidation Exception"	Reporting Periods beginning on or after 1.1.2016
IFRS 10, IAS 28 (amendments): "Sale or Contribution of Assets between an Investor and its Associate or Joint Venture"	Reporting Periods beginning on or after 1.1.2016
IFRS 15: "Revenue from Contracts with Customers"	Reporting Periods beginning on or after 1.1.2018
IFRS 16: "Leases"	Reporting Periods beginning on or after 1.1.2019

2. Summary of significant accounting policies

2.1. Basis of consolidation

In addition to TÜV NORD AG, the Consolidated Financial Statements cover 42 (2014: 43) domestic and 42 (2014: 42) foreign companies in which TÜV NORD AG directly or indirectly holds a majority of the voting power, or over whose financial and operating policies it otherwise exerts control and is thus in a position to obtain benefits from their activities. In determining the situation with regard to control, potential voting rights which are currently exercisable or convertible are also taken into consideration.

An acquired company and, as a result of its increased importance, a non-consolidated company were included in the consolidation in the 2015 fiscal year.

The removal from the list of fully consolidated subsidiaries resulted from the merger of two subsidiaries with other fully consolidated group companies and a liquidation.

In addition, four companies (see under 5.3) are accounted for by the equity method.

Not included in the consolidation are companies which are of only minor significance for a true and fair view of the financial position, financial performance and earnings of the group. This waiver of consolidation has the effect of reducing group revenue by 0.7% (2014: 0.6%) and of a change of consolidated earnings before tax (EBT) of 1.3% (2014: -0.4%).

A list of shareholdings has been prepared in which TÜV NORD group's affiliates and other equity investments are listed, showing the proportion of the capital held. A list of all the group's shareholdings is published in the Federal Gazette as part of the Notes to the Consolidated Financial Statements.

2.2. Acquisitions

The list of consolidated companies was extended in the fiscal year 2015 by one acquisition.

DMT GmbH & Co. KG, Essen acquired 100% of the shares in Dr.-Ing. Wesemann Gesellschaft für Ingenieurgeodäsie mbH (Wesemann), Herne, on September 21 2015 with economic effect from October 1 2015. The acquisition of the company has paved the way to the development of a more comprehensive package of services for geo-engineering services/pipeline engineering within the DMT group. Moreover, dependency on the natural resources markets will be reduced.

The purchase price amounted to €1,760k. The initial consolidation of the company at the time of purchase resulted in a goodwill value in the amount of €924k.

Corporate acquisition, Dr.-Ing. Wesemann **Net assets acquired, goodwill and purchase price** € k	Carrying amounts before initial consolidation	Carrying amounts at initial consolidation
Intangible assets, property, plant and equipment	270	270
Other assets (excluding cash and cash equivalents)	538	538
Cash and cash equivalents	161	161
Liabilities	-133	-133
Total net assets acquired	**836**	**836**
Non-controlling interests		0
Goodwill		924
Purchase price		**1,760**
Cash and cash equivalents acquired		-161
Net outflow of funds for corporate acquisition		**1,599**

2.3. Consolidation policy

The annual financial statements of the subsidiaries included in the consolidation are prepared in accordance with TÜV NORD AG's accounting and valuation methods, which are applied uniformly throughout the group.

Capital consolidation is effected using the purchase method, pursuant to IFRS 3, Business Combinations. Using the purchase method to account for business combinations assumes that, at the time of initial consolidation, all the assets, liabilities and contingent liabilities of the company acquired and also any intangible assets to be recognised in addition are measured at fair value. Any difference amounts between the cost of acquiring the interest in the company and the acquirer's pro-rata share in the reassessed equity at the time of acquisition are allocated to the appropriate balance sheet items of the subsidiary up to the amount of their fair value. Any remaining positive difference is recognised as goodwill. If a negative difference arises, it is to be recognised as an expense in profit and loss for the reporting period during which the business combination takes place. Goodwill is tested for impairment at least once a year.

The earnings of subsidiary companies acquired or disposed of in the course of the fiscal year are included in the Consolidated Income Statement from the point when control was acquired or up to the effective date of disposal.

Significant associates and joint ventures are accounted for using the equity method. An associate is a business entity upon which the group can exert significant influence through participation in financial and operating policy decisions, but over which it cannot exercise control. In general, such significant influence may be presumed if the group holds 20% or more of the voting power. The pro rata earnings from such equity holdings are recognised under the item Income from investments in associates. Should any such equity investments be subject to long-term impairment, impairment losses are recognised. Where a group company undertakes transactions with an associate, any resulting unrealised gains or losses are eliminated pro rata to the group's interest in the associate or joint venture.

Receivables and payables between companies included in consolidation are netted. Profits and losses arising out of intercompany transfers of assets that are to be recognised in the Consolidated Financial Statements are eliminated unless they are immaterial. Revenue and other income between consolidated companies are offset against the corresponding expenses.

During the process of consolidation, income tax effects are taken into account and deferred taxes recognised where appropriate.

Shares in the equity of subsidiaries that are held by parties outside the group are recognised separately within equity capital. The proportions of the earnings of subsidiary companies attributable to outside shareholders (non-controlling interests) are stated separately in the Income Statement.

2.4. Currency translation

Translation into the presentation currency

The annual financial statements of any foreign group company whose functional currency is not the euro are translated into the group presentation currency, i.e. euro, in accordance with the functional currency concept. In general, the functional currencies of the foreign subsidiaries are their respective local currencies.

Assets and liabilities of foreign subsidiaries are translated at the exchange rate prevailing as of the balance sheet date. Equity is translated at historical rates of exchange. Expense and income are translated into euro at average rates for the year. Differences arising out of currency translation are recognised in Other comprehensive income. Such a translation difference recognised in comprehensive income is posted to profit and loss only if the company concerned is deconsolidated.

Translation into the functional currency

Foreign currency transactions are translated into the functional currency at the exchange rate prevailing at the time of the transaction. Gains and losses resulting from the fulfilment of such transactions and from the translation as at the reporting date of monetary assets and liabilities denominated in foreign currencies are recognised in the Income Statement.

The following exchange rates are among those used for the translation of the currencies of countries that are not members of the European Monetary Union:

		Exchange rate as of the reporting date		Annual average rate	
Currency	ISO-Code	31.12.2015	31.12.2014	2015	2014
Brazilian real	BRL	4.3139	3.2410	3.7013	3.2464
British pound sterling	GBP	0.7350	0.7818	0.7577	0.8066
Bulgarian lev	BGN	1.9558	1.9559	1.9558	1.9558
Canadian dollar	CAD	1.5125	1.4117	1.4603	1.4372
Chinese renminbi yuan	CNY	7.0724	7.5550	7.3057	7.9242
Croatian kuna	HRK	7.6514	7.6610	7.6562	7.6403
Czech koruna	CZK	27.0283	27.7434	27.3815	27.5725
Danish krone	DKK	7.4616	7.4457	7.4536	7.4528
Hong Kong dollar	HKD	8.4422	9.4373	8.9120	10.0182
Indian rupee	INR	72.3087	77.4731	74.7999	81.1622
Indonesian rupiah	IDR	15,037.5940	15,128.5930	15,151.5152	15,873.0159
Korean won	KRW	1,277.0250	1,337.3454	1,306.5064	1,392.7577
Malaysian ringgit	MYR	4.6730	4.2622	4.4582	4.3875
Polish zloty	PLN	4.2636	4.2902	4.2769	4.2194
South African rand	ZAR	16.9831	14.0575	15.3825	14.2769
Swedish krone	SEK	9.1827	9.4277	9.3023	9.1158
Thai baht	THB	39.2529	40.0245	39.6354	42.4628
Turkish lira	TRY	3.1815	2.8327	2.9967	2.8877
US dollar	USD	1.0892	1.2166	1.1494	1.2917

2.5. Use of estimates

The preparation of IFRS financial statements requires management to make certain estimates and assumptions which have an impact on the carrying amounts of assets and liabilities, the disclosure of contingent assets and liabilities existing as of the reporting date, and the income and expense recognised for the fiscal year. In compiling the Consolidated Financial Statements, estimates had to be made in particular with regard to the valuation of employee benefits under IAS 19, the impairment testing of goodwill, provisions from the human resources and social sector, the provision for threatened losses from pending transactions and the deferred tax assets relating to loss carryforwards.

Employee benefits relate essentially to obligations arising out of defined benefit pension commitments, which are determined on the basis of actuarial parameters. These require assumptions to be made about future wage and salary increases, trends in pension levels and the discount rate.

Changes in the parameters for determining defined benefit obligations and plan assets do not however affect consolidated earnings for the current year, since any actuarial gains or losses are recognised in Other comprehensive income.

Goodwill is subjected to an annual impairment test on the basis of the smallest cash-generating unit to which goodwill has been allocated and the management's approved three-year operating plan.

Recognition and measurement of the provisions from the human resources and social sector and the provision for threatened losses are based on estimates of the probability of a future outflow of resources and on the basis of experience and of the circumstances known at the reporting date. To this extent, the actual outflow of resources may vary from the amount of the provision.

Deferred tax assets relating to loss carryforwards are accounted for on the basis of estimates of the extent to which the tax advantages can be realised in future, i.e. whether adequate taxable income or reduced tax expense is to be expected. The actual tax situation in future periods, and thus the actual extent to which loss carryforwards can be utilised, may vary from the estimate made at the time when the deferred taxes were recognised.

2.6. Accounting policies

Accounting is undertaken in accordance with the following principles:

Revenue realisation

Revenue from services rendered is recognised as soon as performance is completed.

In the case of longer-term contracts, appropriation is carried out pursuant to IAS 18.20 in accordance with the percentage-of-completion method (PoC method). With this method, expenses and income are recorded according to the degree of completion of the contract. The degree of completion per contract to be applied is thereby calculated using the ratio of accrued costs to the calculated total costs (the cost-to-cost method).

Intangible Assets

Intangible assets encompass intangible assets acquired for consideration and internally generated intangible assets and goodwill.

Intangible assets acquired for consideration, e.g. software and accreditations, are valued at historical cost. This position also includes items identified during purchase price allocations, e.g. customer relations and trade mark rights.

Internally generated intangible assets, e.g. software or research and development costs, are recognised at production cost if this meets the recognition criteria of IAS 38.

Intangible assets with a certain useful life are subject to amortisation by the straight-line method over a period of generally between 3 and 15 years, depending on the expected future economic benefits. The useful life is subject to annual review and, if necessary, is adjusted in accordance with future expectations. If there is any indication of impairment, or if the recoverable amount is less than the amortised cost, an impairment loss must be recognised. Intangible assets with an uncertain useful life are not subject to amortisation, but an impairment test is applied every year.

If the reasons for recognising such an impairment loss cease to apply, the impairment loss is reversed, where the resulting enhanced carrying amount may not exceed the amortised cost arrived at by normal amortisation.

Goodwill arising out of a business combination is recognised from the time when control is obtained over the company acquired (the acquisition date). It arises whenever the cost of acquiring the business exceeds the netted fair value of the identifiable assets, debts and contingent debts at the acquisition date. Goodwill is not subject to amortisation; instead, it is subjected to an impairment test at least once a year, more frequently should any triggering events occur. The impairment test is carried out on the basis of cash-generating units, the recoverable amount of a cash-generating unit being compared with its carrying amount. Under IAS 36, an impairment loss is recognised if the carrying amount of a cash-generating unit to which goodwill has been allocated exceeds its recoverable amount. Impairment losses on goodwill, once recognised, may not be subsequently reversed.

Since 2013 the cash generating units have corresponded with the globally managed business units Industrial Services, Mobility, Training, Natural Resources, Aerospace and IT.

The recoverable amount is the higher of the cash-generating unit's fair value less costs to sell and its value in use. The recoverable amount of a cash-generating unit is calculated by determining its value in use, using the discounted cash flow method on the basis of the three-year plan approved by management. In determining value in use, certain assumptions have to be made, relating essentially to the rate at which operating profit will grow over the planning period, the cost of capital as well as the expected sustained growth rate after the end of the three-year plan. The cost of capital is determined on the basis of the weighted average cost of capital (WACC).

Property, plant and equipment

Assets falling into the category of property, plant and equipment are recognised at depreciated costs (purchase or construction costs). Construction costs include not only direct costs but also attributable overheads.

The revaluation model as per IAS 16.31 is not applied. As a result, under current market conditions the carrying amounts of the TÜV NORD group`s real estate include hidden reserves.

Property, plant and equipment is normally depreciated by the straight-line method, unless, in exceptional cases, some other depreciation method appears more appropriate. Depreciation is based on the following useful lives:

Useful lives of property, plant and equipment	years
Office buildings	30 – 50
Test facilities	20 – 30
Machinery	5 – 12
Furniture, fixtures and office equipment	3 – 20

Under IAS 36, Impairment of assets, property, plant and equipment are subject to impairment if the recoverable amount (see also under "Intangible assets" above) of the asset concerned has fallen below its carrying amount. If the reasons for recognising such an impairment loss cease to apply, the impairment loss is reversed, but only to the extent that the enhanced carrying amount does not exceed the asset's depreciated cost. Such a reversal of an impairment loss is recognised as income.

Leases

Leases are to be classified either as operating leases or finance leases. Under IAS 17, leases under which all the substantial risks and rewards incidental to ownership of an asset are transferred to TÜV NORD group are to be classified as finance leases; other leases are operating leases.

In the case of finance leases, the leased item is recognised from the time of its first use at the lower of fair value and the present value of the minimum lease payments and depreciated by the straight-line method over its estimated economic life, or, if shorter, the term of the lease. The corresponding liability to the lessor is to be recognised in the balance sheet as a liability from a finance lease and amortised over the subsequent period of time using the effective interest rate method. In the case of operating leases, the net lease payments are recognised in the income statement over the term of the lease.

Investments accounted for using the equity method

Associates and joint ventures are initially recognised at cost at the time of their acquisition, and in subsequent accounting periods in accordance with the

proportion of the equity held, using the equity method. The carrying amounts are increased or decreased annually by the amount of the earnings attributable pro rata, the dividends distributed or other changes in equity. Under IAS 28.33, accounting using the equity method is effected on the basis of the financial statements for the previous reporting period. Any goodwill is reviewed in connection with the impairment testing of the investment in the associate (IAS 39) or joint venture. Goodwill is not subject to amortisation.

Other financial assets

The item Other financial assets covers in particular investments in non-consolidated affiliates, other equity investments, loans, securities and claims arising out of the reinsurance of pension obligations.

Under IAS 39, four categories of financial asset are distinguished:

- Financial assets at fair value through profit or loss (held for trading),
- Available-for-sale financial assets,
- Held-to-maturity investments,
- Loans and receivables.

Investments in non-consolidated affiliates, other equity investments and securities that are available for sale are assigned to the "Available for sale" category. Investments in non-consolidated affiliates and associates are recognised at amortised cost, since no fair values are available and other admissible measurement procedures do not lead to reliable results. Securities that are available for sale are recognised at fair value. Changes in value are recognised in equity, making due allowance for deferred tax effects.

If the fair value of a financial asset falls below cost, the impairment loss is recognised as expense.

Loans granted fall into the category "Loans and receivables" and are recognised at amortised cost.

Claims arising out of reinsurance fund shares that do not form part of the plan assets are accounted for at fair value in accordance with IAS 19.

Inventories

Inventories essentially cover work in progress and are measured at cost of production. This includes not only direct labour but also an allocation of proportions of material and production overheads on the basis of normal utilisation of capacity, and also depreciation. In addition, the costs of occupational pensions and of the company's voluntary welfare benefits are included, to the extent that they are attributable to the production area. Administrative costs are recognised to the extent that they are attributable to the production area.

Inventories may be written down to an appropriate and adequate extent to take account of contract-related risks. Where necessary, they are recognised at the lower net realisable value. If the reasons for subjecting inventories to such an impairment loss cease to apply, the impairment loss is reversed.

Trade and other receivables, Other assets

Receivables include the company's trade receivables, other receivables and other assets. They are measured at nominal value or at cost net of impairment. Non-current receivables bearing no or only low interest are discounted at a rate appropriate to the risk, to the extent that the interest effect is material. The amount discounted is recognised pro rata under interest income until the receivable becomes due.

Other receivables and other assets also include receivables from partly fulfilled contracts to render services pursuant to IAS 18.20, which are recognised by the percentage-of-completion method. Any advance payments received are netted against the receivables.

Cash and cash equivalents

Cash and cash equivalents include freely disposable cash in hand, cheques and bank credit balances with a term of up to three months. They are recognised at nominal value.

Deferred tax assets and liabilities

Deferred tax assets and liabilities are recognised for all temporary differences between the carrying amounts of assets and liabilities in the IFRS balance sheet and their tax bases, and also for consolidation

measures recognised through profit or loss, and are as far as is permissible set off against each other in the balance sheet. Deferred tax assets are recognised to the extent that it is probable that there will be taxable income against which the deductible temporary difference can be offset. Deferred tax assets also include claims for reductions in amounts of tax payable arising out of the expected utilisation of existing loss carryforwards in subsequent years, to the extent that their realisation within a period of 5 years is sufficiently certain. Deferred tax assets and liabilities are also recognised where temporary differences arise in connection with business combinations (corporate acquisitions), with the exception of temporary differences relating to goodwill.

Deferred taxes are determined on the basis of the rates of taxation that apply or are expected to apply under current law in the individual countries at the time of realisation. Tax rates that will be applicable in future years are used for calculation purposes to the extent that they have already been laid down in law or the legislative process is practically complete.

Changes in deferred tax assets and liabilities in the balance sheet generally lead to tax expense or income in the income statement; unless they relate to items recognised in comprehensive income; in this case the deferred taxes are also recognised in comprehensive income.

Deferred taxes are not recognised at the reporting date in respect of temporary differences in connection with investments in subsidiaries, associates or joint ventures (outside basis differences). It is not possible to make any reasonable estimate of the amounts of these unrecognised deferred tax liabilities.

For the calculation of domestic deferred taxes, a tax rate of 32.0 %, unchanged from the previous year, has been applied.

Assets held for sale

Assets held for sale are shown separately in the balance sheet if they can be sold in their existing condition and it is probable that they will be. When assets are first classified as "held for sale", they are revalued at the lower of the carrying amount and fair value less costs to sell. Impairment losses resulting from the first-time classification of the assets as being "held for sale", and also any later impairments (or reversals of impairments), are recognised as expense (or income) in the Income Statement. Assets held for sale are not subjected to amortisation.

Provisions for pensions and other post-employment benefits

Post-employment benefit plans are classified as either defined benefit or defined contribution plans, depending on the economic substance of the plan as derived from its principal terms and conditions. Plans are classified as defined benefit plans if the actuarial risk or the investment risk accrues to the employer. Post-employment benefit commitments that cannot be unambiguously classified as defined benefit plans are regarded as defined contribution plans.

The requisite level of pension provisions in respect of defined benefit obligations is determined by actuarial valuation using the projected unit credit method. This valuation is carried out by actuaries as of every balance sheet date. Actuarial gains and losses arising are accounted for directly in equity without passing through the Income Statement, and are recognised in the group Statement of Comprehensive Income.

Through the transfer of claims to reinsurance to TÜV NORD PENSION TRUST e. V. of Hanover, plan assets have been formed whose function is to safeguard the pension obligations.

The service cost included in pension expense and the included net interest expense are recognised under Personnel expense.

Payment obligations under defined contribution pension plans (the statutory pension funds) are recognised in the income statement for the period concerned.

Other provisions

Other provisions are formed if a present legal or constructive obligation exists towards third parties as a result of a past event, in respect of which it is probable that an outflow of resources will be required to settle the obligation and a reliable estimate can be made of the amount of the provision required. The measurement of the provisions is effected using the best estimate of the amount required to settle the obligation, which is not set off against any possible claims for recourse. Non-current provisions are discounted if the interest effect is material.

Trade and other payables

Interest-bearing payables to banks are accounted for at the amount disbursed less directly attributable transaction costs. Financing costs are distributed as expense over the term, increasing the carrying amount of the liability in subsequent periods. Trade and other payables are recognised at amortised cost in accordance with IAS 39. Non-current liabilities that are not subject to interest are discounted using the effective interest method if the interest effect is material. Liabilities arising out of finance leases are recognised at the lower of the fair value of the leased item and the present value of the lease payments. In subsequent years, the lease payments are apportioned between the reduction of the outstanding liability and the finance charge; pursuant to IAS 17.25 this is done in such a way as to produce a constant rate of interest on the remaining balance of the liability.

Contingent liabilities

Contingent liabilities are possible obligations that might arise from past events and whose existence will be confirmed by future events not within the control of the TÜV NORD group. It may also be a question of existing obligations that cannot be recognised because an outflow of resources is improbable or the amount of the obligation cannot be estimated with sufficient reliability. Such contingent liabilities are recognised at the level of liability existing at the reporting date.

3. Consolidated Income Statement disclosures

3.1. Revenue

Revenue breaks down between the six business units as follows:

€ k	2015	2014
Industrial Services	520,820	503,670
Mobility	319,320	304,850
Training	111,089	115,852
Natural Resources	103,559	112,091
Aerospace	47,610	40,185
IT	14,171	12,845
Total	**1,116,569**	**1,089,493**

Revenue includes €26,110k (2014: €22,985k) relating to partly fulfilled contracts to render services, which were recognised proportionately by the percentage-of-completion method as of the reporting date.

Revenue amounting to €825,443k (2014: €811,174k) was generated in Germany, €174,244k (2014: €181,928k) in the rest of Europe and €116,882k (2014: €96,391k) in the rest of the world.

3.2. Other operating income

Other operating income amounting to €93,490k (2014: €41,438k) is essentially made up of the following components: income from the reimbursement of remnant costs in the amount of €61,841k (2014: €8,452k), income from the reversal of provisions €4,717k (2014: €4,880k), canteen takings €1,957k (2014: €1,908k), income from grants and allowances €1,852k (2014: €2,855k), income from disposal of tangible assets €1,623k (2014: €150k), income from the reversal of impairment losses on trade receivables €1,091k (2014: €984k), income from tenancy agreements €754k (2014: €702k), income from the reversal of a negative difference recognised as an expense €386k (2014: €127k), income from ancillary services €114k (2014: €228k).

3.3. Cost of materials

€ k	2015	2014
Cost of raw materials and supplies	44,421	33,002
Cost of services bought in	153,758	146,987
Total	**198,179**	**179,989**

3.4. Personnel expense

€ k	2015	2014
Wages and salaries	558,064	524,379
Social security contributions	123,886	96,401
Post-employment benefit expense	33,996	38,594
Other employee benefits	3,806	4,055
Total	**719,752**	**663,429**

On average over the year, the consolidated companies had 9,794 employees (2014: 9,764) (expressed as full-time equivalents). The group's employees are for the most part salaried staff.

3.5. Depreciation, amortisation and impairment losses

€ k	2015	2014
Depreciation and amortisation of assets	33,637	30,489
Impairment losses	61	1,742
Total	**33,698**	**32,231**

3.6. Other operating expenses

Other operating expenses €209,718k (2014: €204,726k) principally relate to occupancy expenses €59,181k (2014: €60,475k), travelling expenses €40,788k (2014: €39,884k), operating and administrative expenses €21,061k (2014: €20,266k), other services €16,214k (2014: €15,785k), advertising and communication expenses €15,341k (2014: €14,464k), legal and consultancy fees €10,511k (2014: €7,791k) and donations and contributions €2,041k (2014: €2,031k). Value adjustments on doubtful trade receivables amounting to €2,605k (2014: €3,185k) are also included, as are other taxes in the amount of €2,340k (2014: €2,160k).

3.7. Financial items

€ k	2015	2014
Income from equity-accounted investments	1,358	709
Income from other equity investments	59	193
Amortisation of other financial investments and securities	-208	-235
Financial items (excluding interest)	**1,209**	**667**
Interest income on bank balances and sight deposits and other interest income	1,979	1,595
Interest and similar expense	-1,841	-1,996
a) Interest expense on loans and liabilities to banks	-1,472	-1,569
b) Interest included in lease payments	-10	-14
c) Other interest and similar expense	-359	-413
Net interest income/ expense	**138**	**-401**
Financial items (including interest)	**1,347**	**266**

3.8. Taxes on income

The group's tax expense is as follows:

€ k	2015	2014
Current tax expense	-20,156	-20,009
Deferred tax expense/ income	-736	153
Total	**-20,892**	**-19,856**

The deferred taxes result from the formation or reversal of tax accruals in profit or loss during the fiscal year. In both fiscal years the deferred taxes are predominantly the result of temporary differences being recognised or reversed.

The following reconciliation statement summarises the individual deferred tax items determined in relation to the individual companies and applying the tax rates prevailing in the various countries, taking due account of consolidation measures. The table reconciles expected tax expense with the tax expense actually recognised.

€ k	2015	2014
Earnings before tax	54,821	49,238
Expected income tax expense (tax rate: 32.0%; 2014: 32.0%)	17,543	15,756
Effect of different foreign tax rates / Other differences	-701	-291
Changes in tax rates or tax legislation	76	73
Permanent differences resulting from non-deductible expense, tax-free income etc.	771	1,527
Current taxes for previous periods	-676	964
Deferred taxes for previous periods	284	248
Effects of value adjustments	3,595	1,579
Recognised income tax expense	**20,892**	**19,856**

The expected tax rate for both fiscal years was determined on the basis of a corporation tax rate of 15.0% plus a solidarity levy of 5.5% of the tax due and a local business tax rating of 462%.

Deferred taxes resulting from recognition and measurement differences arose in the following balance sheet items:

€ k	2015 Deferred tax assets	2015 Deferred tax liabilities	2014 Deferred tax assets	2014 Deferred tax liabilities
Intangible assets	1,950	5,736	1,742	5,906
Property, plant and equipment	864	11,112	658	10,744
Inventories	0	2,072	0	1,869
Other assets	1,441	3,067	2,055	2,533
Pension provisions	145,353	0	118,568	0
Other provisions	11,573	523	10,233	372
Other liabilities	1,462	95	922	191
Tax loss carryforwards	5,018	0	4,771	0
Gross amount	**167,661**	**22,605**	**138,949**	**21,615**
Offsettings	-10,798	-10,798	-10,389	-10,389
Balance sheet recognition	**156,863**	**11,807**	**128,560**	**11,226**

Deferred tax assets are recognised only if there is sufficient probability that these tax advantages will be realised. Any value adjustments are determined taking into account all positive and negative factors known at the present time that may influence future taxable earnings. The estimates made for this purpose may be subject to future adjustments.

Deferred taxes amounting to €28,437k (2014: €31,734k) were recognised in comprehensive income. This is essentially a result of the recognition of actuarial gains/losses relating to pension provisions.

As of the reporting date, deferred tax assets were recognised for loss carryforwards in the amount of €30,413k (2014: €26,166k) existing in the group. In respect of further tax loss carryforwards in the amount of €51,516k (2014: €35,683k), no additional deferred tax assets have been recognised as of the reporting date, since it is not sufficiently certain that these can be realised. Under current legislation, there is no limitation, either of time or amount, on such loss carryforwards for tax purposes.

4. Notes on the consolidated statement of comprehensive income

The deferred taxes in the amount of €28,437k (2014: €31,734k) reported in Other comprehensive income relate to the actuarial losses of €91,491k (2014: €102,891k) in the fiscal year. The actuarial losses after deferred tax amount to €63,054k (2014: €71,157k). The other comprehensive income before deferred tax amounts to €-90,700k (2014: €-100,598k).

5. Consolidated Balance Sheet Disclosures

In accordance with IAS 1, the Consolidated Balance Sheet (Statement of Financial Position) is structured to present the breakdown of current and non-current assets and liabilities. Assets and liabilities are regarded as current if it is expected that they will be recovered or settled within a year. Inventories and trade receivables are also classified as current, irrespective of their expected use or due dates, if they are to be sold, used or recovered not within one year, but within the company's normal operating cycle. In accordance with IAS 12, deferred taxes are recognised as non-current assets or liabilities.

5.1. Intangible assets

The following changes in intangible assets occurred:

Changes 2015 € k	Concessions, proprietary rights and similar rights and assets, including licences to such rights and assets	Goodwill	Payments made on account	Total
Cost (of purchase or production)				
Amounts as of January 1	55,605	77,491	59	**133,155**
Changes in basis of consolidation	143	924	0	**1,067**
Additions / Current investments	3,261	0	6	**3,267**
Disposals	-1,225	0	0	**-1,225**
Reclassifications	216	0	-33	**183**
Currency translation differences	-15	124	1	**110**
Amounts as of December 31	**57,985**	**78,539**	**33**	136,556
Accumulated amortisation and impairment losses				
Amounts as of January 1	49,111	1,122	0	**50,233**
Changes in basis of consolidation	117	0	0	**117**
Additions	5,082	0	0	**5,082**
Disposals	-950	0	0	**-950**
Reclassifications	108	0	0	**108**
Currency translation differences	9	0	0	**9**
Amounts as of December 31	**53,477**	**1,122**	**0**	54,599
Net carrying amounts	**4,508**	**77,417**	**33**	81,957

The changes in the basis of consolidation presented under Goodwill relate to the acquisition of Wesemann (€924k).

Changes 2014 € k	Concessions, proprietary rights and similar rights and assets, including licences to such rightsand assets	Goodwill	Payments made on account	Total
Cost (of purchase or production)				
Amounts as of January 1	54,205	76,083	18	**130,306**
Changes in basis of consolidation	13	1,047	0	**1,060**
Additions / Current investments	2,138	309	55	**2,502**
Disposals	-783	-15	-1	**-799**
Reclassifications	5	-5	-16	**-16**
Currency translation differences	28	73	2	**103**
Amounts as of December 31	**55,605**	**77,491**	**59**	**133,155**
Accumulated amortisation and impairment losses				
Amounts as of January 1	46,232	1,115	0	**47,347**
Changes in basis of consolidation	0	0	0	**0**
Additions	3,642	0	0	**3,642**
Disposals	-780	0	0	**-780**
Reclassifications	0	0	0	**0**
Currency translation differences	18	7	0	**25**
Amounts as of December 31	**49,111**	**1,122**	**0**	**50,234**
Net carrying amounts	**6,494**	**76,369**	**59**	**82,921**

The changes in the basis of consolidation in 2014 presented under Goodwill relate to the acquisition of TN Bautechnik (€737k) and ACPRO (€310k), and the additions essentially resulted from the purchase of assets of WPL-Werkstatt-Prüf-Labor-GmbH.

Impairment testing of all the goodwill recognised in the Consolidated Balance Sheet did not lead to any additional impairment losses, since in each case the fair value less costs to sell is higher than the carrying amount recognised by the cash-generating unit concerned. The weighted average cost of capital (WACC) applied for discounting purposes is 5.00% (2014: 4.85%), where a growth discount of 1.0% is applied after the end of the three-year planning period.

No change that might reasonably be made to any of the basic assumptions for the purpose of determining the value in use of the cash-generating units could lead to their carrying amounts materially exceeding the recoverable amounts.

The goodwill subjected to impairment testing is essentially shared between the business units Natural Resources (2015: €35,687k; 2014: €34,763k), Industrial Services (2015: €28,892k; 2014: €28,768k) and Aerospace (2015: €12,465k; 2014: €12,465k).

5.2. Property, plant and equipment

The following changes occurred in property, plant and equipment:

Changes 2015 € k	Land, leasehold rights and buildings, including buildings on third-party land	Machinery	Furniture and fittings, other factory and office equipment	Payments made on account and assets under construction	Total
Cost (of purchase or production)					
Amounts as of January 1	281,674	123,333	200,243	1,927	**607,177**
Changes in basis of consolidation	0	0	916	0	**916**
Additions / Current investments	1,132	8,296	23,671	5,647	**38,746**
Disposals	-1,442	-1,117	-12,806	-213	**-15,578**
Reclassifications	162	922	-86	-279	**719**
Currency translation differences	267	158	220	14	**658**
Amounts as of December 31	**281,793**	**131,592**	**212,158**	**7,095**	**632,638**
Accumulated depreciation and impairment losses					
Amounts as of January 1	148,368	86,126	161,788	191	**396,472**
Changes in basis of consolidation	0	0	664	0	**664**
Depreciation	4,351	8,371	15,833	0	**28,555**
Impairment	2	3	56	0	**61**
Disposals	-1,145	-1,017	-12,462	0	**-14,624**
Reclassifications	113	699	246	-1	**1,056**
Currency translation differences	42	81	177	0	**300**
Amounts as of December 31	**151,731**	**94,263**	**166,301**	**190**	**412,485**
Net carrying amounts	**130,062**	**37,329**	**45,857**	**6,905**	**220,153**

Changes 2014 € k	Land, leasehold rights and buildings, including buildings on third-party land	Machinery	Furniture and fittings, other factory and office equipment	Payments made on account and assets under construction	Total
Cost (of purchase or production)					
Amounts as of January 1	286,337	115,890	187,230	2,152	**591,608**
Changes in basis of consolidation	0	43	13	0	**56**
Additions / Current investments	2,369	6,585	18,562	1,438	**28,954**
Disposals	-1,069	-760	-6,262	-1	**-8,092**
Reclassifications	-6,236	1,392	273	-1,664	**-6,235**
Currency translation differences	273	183	428	1	**885**
Amounts as of December 31	**281,674**	**123,333**	**200,243**	**1,927**	**607,177**
Accumulated depreciation and impairment losses					
Amounts as of January 1	147,162	78,497	153,111	190	**378,960**
Changes in basis of consolidation	0	0	0	0	**0**
Depreciation	4,417	8,170	14,259	1	**26,848**
Impairment	1,542	0	199	0	**1,742**
Disposals	-771	-716	-6,005	0	**-7,492**
Reclassifications	-4,007	101	-101	0	**-4,007**
Currency translation differences	24	74	324	0	**421**
Amounts as of December 31	**148,368**	**86,126**	**161,788**	**191**	**396,472**
Net carrying amounts	**133,306**	**37,207**	**38,455**	**1,736**	**210,704**

The following assets are subject to limitations to their availability:

€ k	31.12.2015	31.12.2014
Machinery	151	162
Furniture and fittings, other factory and office equipment	1,061	869

Items of property, plant and equipment to the value of €3,584k (2014: €3,563k) are pledged as collateral for debt. The liabilities secured as of December 31 2015 amount to €390k (2014: €1,113k).

Compensation payments by third parties in the amount of €573k (2014: €178k) are recognised as Other operating income.

The following carrying amounts of property, plant and equipment relate to assets on lease under finance leases:

	Initial recognition amounts		Accumulated depreciation and impairment losses		Net carrying amounts	
€ k	2015	2014	2015	2014	2015	2014
Furniture and fittings, other factory and office equipment	806	904	476	449	330	455

The following minimum lease payments will be payable in future on the basis of existing finance leases:

	up to 1 year		1-5 years		Total	
€ k	2015	2014	2015	2014	2015	2014
Total minimum lease payments	157	225	333	226	490	451
Interest expense included	-7	-8	-6	-6	-13	-14
Present values	**150**	**217**	**327**	**220**	**477**	**437**

There are no minimum lease payments with residual terms of more than 5 years.

Obligations under finance leases are recognised under Other liabilities (see under 5.13.).

Future obligations under operating leases where the benefits of ownership do not lie with TÜV NORD group as lessee are recognised under Other financial liabilities (see under 5.16.).

5.3. Equity-accounted investments

The following table shows the names and the locations of the registered offices of companies accounted for using the equity method, together with the percentage of the equity held, the company's total equity and its total earnings after tax:

Name, location of registered office	Share of equity in %	Total equity 100 % in € k	EAT 100 % in € k
National Inspection and Technical Testing Company Ltd. (FAHSS), Damman, Saudi Arabia	25.11	10,885	2,569
OutSmart B.V., Velp, the Netherlands	25.10	464	51
TÜV Middle East W.L.L., Manama, Bahrain	25.10	7,280	1,646
UAB TÜVLITA, Vilnius, Lithuania	50.00	5,290	698

These are exclusively associated companies.

For the associates that are material to TÜV NORD AG the following table shows financial information as well as reconciliation to the carrying amount of the interest in the associate:

€ k	31.12.2015	31.12.2014
Results from FAHSS		
Revenues	25,689	18,887
Earnings after tax/total comprehensive income	2,569	1,265
Share of earnings after tax/total comprehensive income	518	276
Balance sheet information FAHSS		
Current assets	15,491	10,579
Non-current assets	5,317	4,381
Current liabilities	-5,749	-3,536
Non-current liabilities	-4,174	-3,163
Equity	10,885	8,261
Share of equity	2,622	1,896
Other	-362	-362
Book value of the equity-accounted FAHSS	**2,260**	**1,534**

€ k	31.12.2015	31.12.2014
Results from TÜV Middle East		
Revenues	20,706	16,145
Earnings after tax/total comprehensive income	1,646	808
Share of earnings after tax/total comprehensive income	413	203
Balance sheet information TÜV Middle East		
Current assets	11,593	9,290
Non-current assets	1,008	669
Current liabilities	-3,553	-2,896
Non-current liabilities	-1,768	-1,336
Equity	7,280	5,727
Share of equity	1,827	1,437
Other	-59	-160
Book value of the equity-accounted TÜV Middle East	**1,768**	**1,277**

The following table shows summarised financial information on both non-material investments accounted for using the equity method:

€ k	31.12.2015	31.12.2014
Assets	7,844	6,741
Liabilities	-2,090	-1,621
Equity	5,754	5,120

Income from non-material investments accounted for using the equity method is shown in the following table:

€ k	2015	2014
Earnings after tax	750	280
Share of earnings after tax	362	231
Share of total comprehensive income	362	231
Book value of non-material associates	**3,422**	**3,206**

These figures were determined on the basis of audited financial statements for the previous year (see under 2.6.).

5.4. Other financial assets

For TÜV NORD AG's other equity investments please refer to the list of shareholdings (see under 7.7.).

The following changes in other financial assets occurred during the year under review:

Changes 2015 € k	Investments in affiliates	Investments in joint ventures and associates (not equity accounted)	Other equity invest-ments	Long-term securites	Loans granted	Shares in guarantee funds arising from rein-surance	Total
Cost (of purchase or production)							
Amounts as of January 1	6,100	328	301	20,958	1,329	32,091	**61,108**
Changes in basis of consolidation	-250	0	0	0	0	0	**-250**
Additions	125	1,483	0	22	20	2,523	**4,173**
Disposals	-3	0	0	-7,981	-33	-1,045	**-9,062**
Reclassifications	0	0	0	0	0	-7,289	**-7,289**
Currency translation differences	-49	0	1	-8	0	0	**-55**
Amounts as of December 31	**5,924**	**1,811**	**303**	**12,992**	**1,316**	**26,280**	**48,624**
Accumulated amortisation and impairment losses							
Amounts as of January 1	3,831	303	123	0	1,151	0	**5,407**
Additions	0	0	0	208	0	0	**208**
Disposals	0	0	0	0	0	0	**0**
Reclassifications	0	0	0	0	0	0	**0**
Currency translation differences	6	0	0	0	0	0	**6**
Amounts as of December 31	**3,837**	**303**	**123**	**208**	**1,151**	**0**	**5,622**
Net carrying amounts	**2,087**	**1,508**	**180**	**12,783**	**165**	**26,280**	**43,003**

Of the reinsurance claims on Alters- und Hinterbliebenen-Versorgungsstelle der Technischen Überwachungs-Vereine – VvaG –, Essen, (AHV) claims of €7.978k (2014: €15,894k) have been pledged as collateral to secure loan liabilities and obligations arising out of pre-retirement part-time working arrangements.

Changes 2014 € k	Investments in affiliates	Investments in joint ventures and associates (not equity accounted)	Other equity invest-ments	Long-term securites	Loans granted	Shares in guarantee funds arising from rein-surance	Total
Cost (of purchase or production)							
Amounts as of January 1	5,722	331	675	25,936	2,627	32,555	**67,845**
Changes in basis of consolidation	0	0	0	0	0	0	**0**
Additions	380	13	0	67	23	4,143	**4,625**
Disposals	-25	0	-344	-5,045	-1,320	-1,832	**-8,565**
Reclassifications	-6	-15	-32	0	0	-2,775	**-2,828**
Currency translation differences	29	0	2	0	0	0	**31**
Amounts as of December 31	**6,100**	**328**	**301**	**20,958**	**1,329**	**32,091**	**61,108**
Accumulated amortisation and impairment losses							
Amounts as of January 1	3,592	265	160	0	2,430	0	**6,447**
Additions	235	0	0	0	0	0	**235**
Disposals	-2	0	0	0	-1,279	0	**-1,281**
Reclassifications	0	38	-38	0	0	0	**0**
Currency translation differences	6	0	0	0	0	0	**6**
Amounts as of December 31	**3,831**	**303**	**123**	**0**	**1,151**	**0**	**5,407**
Net carrying amounts	**2,269**	**25**	**179**	**20,958**	**178**	**32,091**	**55,700**

5.5. Inventories

€ k	2015	2014
Raw materials and supplies	1,339	1,292
Work in progress	52,050	52,360
Finished products and merchandise	8,850	3,650
Payments made on account	3,568	3,896
Total	**65,807**	**61,198**

Write-downs amounting to €229k (2014: €3k) are recognised under Inventories.

5.6. Trade and other receivables

Trade and other receivables can be disaggregated in accordance with their residual terms as follows:

	2015			2014		
€ k	Current	Non-current	Total	Current	Non-current	Total
Trade receivables						
from third parties	137,315	249	137,563	124,286	166	124,452
from partly fulfilled contracts to render services	23,465	41	23,507	15,848	0	15,848
Receivables from affiliates	920	97	1,017	819	43	862
Receivables from joint ventures, associates and other entities in which equity investments are held	3,697	2	3,699	2,480	0	2,480
Total	**165,397**	**389**	**165,786**	**143,433**	**209**	**143,642**

During the period under review, value adjustments on doubtful receivables were effected in the amount of €2,605k (2014: €3,185k).

The development of specific value adjustments was as follows:

€ k	2015	2014
Carrying amount as of January 1	**7,856**	**7,489**
Changes in basis of consolidation	8	0
Additions	2,605	3,185
Use	1,395	1,963
Reversals	1,091	984
Currency translation effects	123	129
Carrying amount as of December 31	**8,106**	**7,856**

Receivables that have not been subjected to specific value adjustments can be disaggregated as follows:

€ k	2015	2014
Trade receivables from third parties, gross	**145,669**	**132,308**
a) of which neither overdue nor impaired	62,238	43,485
b) of which overdue by the following periods, but not yet impaired		
1 to 30 days	47,749	56,006
31 to 60 days	14,029	12,120
61 to 90 days	4,911	4,807
91 to 180 days	5,042	4,976
more than 180 days	11,700	10,914
Value adjustments	**-8,106**	**-7,856**
Trade receivables from third parties, net	**137,563**	**124,452**

5.7. Other assets

Other assets with a residual term of more than one year are classified as non-current, and those with a residual term of less than one year as current.

The other assets recognised essentially consist of accrued items and tax reimbursement claims. The items break down as follows:

	2015			2014		
€ k	Current	Non-current	Total	Current	Non-current	Total
Other assets	16,733	4,416	21,149	15,549	3,912	19,461

As of the reporting date there were no items more than 180 days overdue for which no impairment loss had been recognised.

5.8. Cash and cash equivalents

The cash and cash equivalents consist of cheques, cash in hand and balances on account with a number of different banks in various currencies. The bank balances earn interest at customary market rates.

5.9. Assets held for sale

Pursuant to IFRS 5, developed properties in respect of which disposal procedures have been initiatied are reported under the item "Assets held for sale". In the fiscal year 2015 an income of €1,197k was reported from the sale of such assets (2014: €0k).

5.10. Equity

For further details of changes in equity between January 1 2014 and December 31 2015, see the Statement of Changes in Consolidated Equity.

TÜV NORD's capital management policy aims not only to secure the continued existence of the business, but also to achieve an adequate return in excess of the costs of capital, thereby enhancing the value of the company in the long term. The equity is monitored regularly on the basis of various indicators.

Subscribed capital

The subscribed capital remains unchanged at €10,000k, divided into 100,000 registered no-par-value shares. All the shares are fully paid.

At the time of the preparation of the Consolidated Financial Statements for the 2015 fiscal year, TÜV NORD AG had neither contingent nor authorised capital. TÜV NORD AG does not grant any share-based remuneration (share option programmes) to its employees.

Capital reserves

The capital reserves of TÜV NORD group in the amount of €114,413k correspond to the capital reserves of TÜV NORD AG.

Subordinated registered debenture

As of December 31 2015, the subordinated registered debentures taken out by the TÜV NORD AG amounted to €50,000.

On December 8 2015 TÜV NORD AG took out a subordinated registered debenture without a fixed term amounting to €10,000k with RWTÜV e. V., Essen. The interest rate is fixed at 4.125% until June 7 2021 and will then increase by 100 basis points for each additional 5-year period. A termination option is exclusively available to TÜV NORD AG for the first time as of June 7 2021, thereafter annually.

On October 1 2015 TÜV NORD AG took out a subordinated registered debenture without a fixed term amounting to €11,000k with TÜV Nord e. V., Hamburg and amounting to €9,000k with the TÜV Hannover/Sachsen-Anhalt e. V., Hanover. The interest rate is fixed at 4.125% until March 31 2021 and will then increase by 100 basis points for each additional 5-year period. A termination option is exclusively available to TÜV NORD AG for the first time as of March 31 2021, thereafter annually.

The subordinated registered bond amounting to €20,000k, separately itemised on December 31 2014, was taken out without a fixed term with the Alters- und Hinterbliebenen-Versorgungsstelle der Technischen Überwachungs-Vereine – VvaG –, Essen, (AHV). The interest rate is fixed at 4.125 % until June 30 by 2020 and will then increase by 100 basis points for each additional 5-year period. A termination option is exclusively available to TÜV NORD AG for the first time as of June 30 2020, thereafter annually.

Interest payments are the discretion of TÜV NORD AG. They are also to be paid retroactively in full, for instance, in the event of the redemption of the registered debenture, distributions to the shareholders or the repayment of other liabilities of equal rank or in the case of economically similar procedures.

Retained earnings

The retained earnings include the earnings of the consolidated companies, to the extent that these have not been distributed as dividends. In addition, the offsetting of asset-side and liability-side differences arising out of the capital consolidation of acquisitions up to December 31 2006 and also the net amount of non-cash adjustments in connection with the first-time adoption of IFRS are recognised under this item.

Other equity items

The other equity items include the non-cash impacts on equity of the currency translation of foreign subsidiaries' separate financial statements, of changes in the fair values of available-for-sale instruments, and of actuarial gains and losses arising out of post-employment benefit plans, and also the deferred taxes recognised in connection with these items.

Non-controlling interests

Non-controlling interests cover holdings by investors outside the TÜV NORD group in the consolidated equity of group companies.

The significant non-controlling interests are held in the following group companies:

€ k	31.12.2015	31.12.2014
DMT Consulting Private Limited, Kolkata, India	729	765
Höntzsch GmbH, Waiblingen, Germany	1,015	1,017
TÜV India Private Ltd., Mumbai, India	4,286	3,804
TÜV NORD CERT GmbH, Essen, Germany	1,300	1,161
TÜV NORD Mobilität Immobilien GmbH, Essen, Germany	854	721
Various other companies	1,393	1,043
Total	**9,577**	**8,511**

The voting rights of other shareholders are in proportion to their share of the equity. No further information is given due to lack of materiality on the subsidiaries in which non-controlling minority shareholders have a stake. More information can be found in the list of shareholdings in chapter 7.7.

5.11. Provisions for pensions and other post-employment benefits

Provisions are formed for obligations arising out of entitlements and current benefits of serving and former employees and their surviving dependents, to the extent that these arise under a defined benefit plan. These provisions are determined in accordance with actuarial valuations of existing benefit obligations, which are recalculated every year. The costs resulting

from these commitments are allocated over the employee's period of service in accordance with the actuaries' findings, and comprise current or past service cost and interest cost.

The full amount of actuarial gains and losses is recognised in Other comprehensive income, while making due allowance for deferred taxes. These actuarial gains and losses are therefore presented in the group Statement of Comprehensive Income.

The net pension cost is shown as personnel expense.

A contractual trust agreement (CTA) was initially funded with effect from December 30 2008. Shares in reinsurance guarantee funds which serve exclusively and irrevocably to cover and fund post-employment benefit obligations were vested in TÜV NORD PENSION TRUST e. V. Under IFRS rules, the assets of the CTA are to be regarded as plan assets. The plan assets consist exclusively of these reinsurance guarantee fund shares. The plans encumber the group with general actuarial risks, such as, for example, longevity risk, currency risk, interest rate risk and market (investment) risk.

The level of post employment benefit obligations (the present value, determined by actuarial valuation, of the defined benefit obligations (DBO)) was calculated by actuarial methods, a procedure in which the use of estimated values is unavoidable.

Pursuant to IAS 19, employee benefits, the level of post-employment benefit obligations is determined by the projected unit credit method, under which actuarial methods on the basis of best estimates of the relevant parameters are used to assess the vested future obligations existing as of the valuation date.

The post-employment benefits that are expected to become payable, including dynamic components, are distributed over the employee's entire period of service. For the year under review, the following assumptions were made by the actuaries with regard to the variable parameters to be included in their calculations:

%	2015	2014
Discount rate as of 31.12.	2.40	3.00
Future pension increases	1.20	1.20
Future wage and salary increases	1.50	1.50
Employee turnover	2.00	2.00

The actuaries review and revise their findings every year. The actuarial assumptions with regard to mortality are based (with regard to Germany) on the Heubeck mortality tables, version 2005G. The actuarial assumptions do not materially differ between Germany and other countries, with the exception of the discount rate.

The group has both defined benefit and defined contribution plans for commitments for retirement, invalidity and surviving dependants' pensions based on works agreements and individual contractual agreements. Defined benefit pension plans were offered only to staff who joined the company up to and including December 31 1991 or, as the case may be, December 31 1993. The level of these commitments is calculated according to the eligible income and/or social insurance pension as well as length of service. The benefits are paid directly by the company which granted the pension commitment.

The following table shows changes in the present value of future post-employment benefit obligations and of the plan assets.

€ k	Benefit obligation	Plan assets	Total
Carrying amounts as of January 1 2015	**1,064,332**	**-706,210**	**358,122**
Current service cost	14,063	0	14,063
Net interest cost (interest cost/interest income)	32,614	-21,088	11,526
Net pension cost	**46,677**	**-21,088**	**25,589**
Actual interest on plan assets less actuarial interest income	0	-1,854	-1,854
Actuarial gains/losses from changes in financial assumptions	93,344	0	93,344
Remeasurement of defined benefit pension plans	**93,344**	**-1,854**	**91,490**
Pension payments	-53,850	0	-53,850
Payments from the pension plan	0	37,757	37,757
Employer's contributions to the pension plan	0	-27,818	-27,818
Total payments	**-53,850**	**9,939**	**-43,911**
Transfer of obligations	2,679	-1,549	1,130
Changes in scope of consolidation/changes in currency translation and other effects	-3,986	-3,717	-7,703
Carrying amounts as of December 31 2015	**1,149,196**	**-724,479**	**424,717**
Other amounts recognised in the balance sheet	0	0	0
Provisions for pensions recognised in the balance sheet as of December 31 2015	**1,149,196**	**-724,479**	**424,717**

€ k	Benefit obligation	Plan assets	Total
Carrying amounts as of January 1 2014	**953,034**	**-685,536**	**267,498**
Current service cost	15,655	0	15,655
Net interest cost (interest cost/interest income)	39,823	-25,428	14,395
Net pension cost	**55,478**	**-25,428**	**30,050**
Actual interest on plan assets less actuarial interest income	0	-720	-720
Actuarial gains/losses from changes in financial assumptions	103,611	0	103,611
Remeasurement of defined benefit pension plans	**103,611**	**-720**	**102,891**
Pension payments	-51,151	0	-51,151
Payments from the pension plan	0	36,264	36,264
Employer's contributions to the pension plan	0	-28,680	-28,680
Total payments	**-51,151**	**7,584**	**-43,567**
Transfer of obligations	917	-1,144	-227
Changes in scope of consolidation/changes in currency translation and other effects	2,443	-966	1,477
Carrying amounts as of December 31 2014	**1,064,332**	**-706,210**	**358,122**
Other amounts recognised in the balance sheet	36	0	36
Provisions for pensions recognised in the balance sheet as of December 31 2014	**1,064,368**	**-706,210**	**358,158**

The ratio of benefit obligation to plan assets reflects the funded status of the benefit plan in question, with any excess of the benefit obligation over plan assets constituting a plan deficit. Both the benefit obligation and plan assets can vary over time, leading to an increase/decrease in the plan deficit. Reasons for such fluctuation can include changes in market interest rates and, in consequence, in the discount rate, or adjustments to actuarial assumptions.

The TÜV NORD group's plan assets exclusively comprise employer pension liability insurance policies and are subject to only limited fluctuation on account of the existing minimum returns. Price reporting on an active market does not exist for employer's pension liability insurance policies. The recognised plan deficit is covered by cash flows from operating activities. It is the long-term goal of the TÜV NORD group to gradually increase plan assets. The employer contributions to plan assets are expected to amount to €26.0 million in 2016. The weighted average term of the remainder of benefit obligations is 13.2 years.

The table below shows the effects on the defined benefit obligation (DBO) of any change in the parameters. The analysis relates to parameters where a change was considered possible as of the reporting date. The values here are mean values which were weighted with the present value of the respective pension obligation. Any correlation between the parameters is not taken into account in the calculation.

Sensitivity analysis in %	Change in parameter	Increase in parameter	Decrease in parameter
Interest rate	1.0%	12.1% DBO decrease	14.8% DBO increase
Rate of pension progression	0.5%	5.5% DBO increase	5.3% DBO decrease

Employer contributions to mandatory pension schemes as well as contributions to other defined contribution plans were made in the amount of €42.2 million in 2015 (2014: €41.8 million).

5.12. Other non-current and current provisions

€ k	Provisions for the areas of personnel and welfare	Sundry other provisions	Total
Carrying amounts as of January 1 2015	**55,144**	**41,725**	**96,870**
Additions	30,333	9,729	40,062
Use	32,148	4,570	36,719
Reversals	2,371	2,160	4,531
Reclassifications/Transfers	-697	1,035	338
Currency translation differences	197	69	266
Carrying amounts as of December 31 2015	**50,458**	**45,828**	**96,286**

The provisions for obligations in the areas of personnel and welfare relate essentially to pre-retirement part-time working, long-service bonuses, social plan measures and other personnel and non-wage personnel costs.

The sundry other provisions relate mainly to provisions for warranty obligations, provisions for threatened losses from pending transactions and other risks.

Of the total amount of the sundry other provisions as of December 31 2015, €37,414k (2014: €32,988k) are current and €8,414k (2014: €8,737k) are non-current. No material interest accruals on non-current provisions have been recognised.

5.13. Non-current and current trade and other payables

Payables can be disaggregated in accordance with their residual terms as follows:

	2015			2014		
€ k	Current	Non-current	Total	Current	Non-current	Total
Amounts payable to banks	125	388	513	21,230	507	21,737
Amounts payable under finance leases	150	327	478	216	220	436
Financial liabilities	**276**	**715**	**991**	**21,447**	**727**	**22,173**
Trade payables						
to third parties	27,931	47	27,978	19,635	318	19,953
from partly fulfilled contracts to render services	1,160	0	1,160	1,178	0	1,178
Payables to affiliates	324	1	325	393	3	397
Payables to joint ventures, associates and other entities in which equity investments are held	1,064	0	1,064	515	0	515
Outstanding invoices	23,945	0	23,945	17,530	0	17,530
Amounts payable to employees	29,722	740	30,462	25,252	303	25,555
Other payables	30,724	11,967	42,691	29,955	18,435	48,389
Trade and other payables	**114,868**	**12,755**	**127,624**	**94,457**	**19,059**	**113,516**
Payments received on account	62,346	21	62,367	48,089	52	48,141
Other taxes	15,855	0	15,855	15,976	0	15,976
Sundry payables	**78,201**	**21**	**78,222**	**64,065**	**52**	**64,117**
Total payables	**193,345**	**13,491**	**206,836**	**179,969**	**19,837**	**199,806**

The amounts payable to banks include an amount of €0k (2014: €20,000k) drawn down under a syndicated credit line with a ceiling of €175,000k. Interest at the three-month EURIBOR rate plus a margin of 100 basis points was payable on the amount drawn down from the time of disbursement.

Amounts payable under finance leases relate to leases of capital goods and are recognised as liabilities in the amount of the future obligation.

Trade payables from partly fulfilled contracts to render services relate to contracts with regard to which the payments received from customers on account exceed the accumulated receivables from the fulfilment of the contracts concerned.

Amounts payable to employees include €14,037k (2014: €12,389k) for obligations in lieu of free time and €6,712k (2014: €7,437k) for obligations relating to holiday not yet taken.

Other payables include an accrual of TÜV NORD College GmbH in the amount of €14,801k (2014: €17,513k), arising out of the financing of the operations of the vocational training colleges.

5.14. Contingent liabilities

TÜV NORD AG bears liability in cases where it and its subsidiaries have given guarantees in favour of various contractual partners.

In the year under review, an amount of €8,512k (2014: €9,341k) for contingent liabilities is recognised and relates to sureties given for the most part to banks. TÜV NORD AG gives performance bonds in respect of liabilities of group companies arising out of joint projects or consortia. If the consortium partner does not honour its contractual obligations, TÜV NORD AG may be liable to meet claims for payment up to the amount of the agreed surety. Generally, the agreed terms correspond to those of the underlying transaction.

5.15. Litigation

Neither TÜV NORD AG nor its group companies are involved in litigation that could have a material impact on the economic or financial position of the companies or of the group. In respect of other litigation, adequate provisions have been formed by the company concerned in any given case for any awards that may be made against it. As of the reporting date, these provisions amount to €977k (2014: €1,311k).

5.16. Other financial liabilities

As of December 31 2015, obligations exist to order items of property, plant and equipment to the value of €786k (2014: €167k).

The other financial liabilities relate to rental and leasing obligations for premises, furniture and fittings and factory and office equipment which are classified as operating leases pursuant to IAS 17.

The minimum lease payments fall due as follows:

€ k	Up to 1 year	1-5 years	More than 5 years	Total
Minimum lease payments for rented real estate	13,956	39,978	37,890	**91,824**
Minimum lease payments under other operating leases	5,173	13,178	14,476	**32,827**

The other financial rental obligations are predominantly to be classified as non-current. They have terms of between five and ten years.

Expense under such contracts recognised in the Income Statement amounts to €38,637k (2014: €39,728k).

6. Consolidated Cash Flow Statement disclosures

The figures for cash and cash equivalents presented in the cash flow statement embrace all cash and cash equivalents recognised in the balance sheet, i.e. cash in hand, cheques and balances on account with banks. The recognised cash and cash equivalents are freely disposable and not subject to any restrictions in favour of third parties.

7. Other disclosures

7.1. Events after the reporting period

No events that are material to the presentation of the group's financial position had occurred up to the date on which the financial statements were authorised for issue.

7.2. Fees paid to the auditors of the Consolidated Financial Statements

The following fees, paid to the auditors of the Consolidated Financial Statements, BDO AG Wirtschaftsprüfungsgesellschaft, during the year under review, have been recognised as expense pursuant to Article 314 (1) No. 9 of the German Commercial Code (HGB):

€ k	2015	2014
Auditing services	733	704
Tax consultancy services	24	74
Other consultancy services	32	19
Total	**789**	**797**

7.3. Financial instruments

The evaluation of categories of financial instruments relevant in accordance with IFRS 7 for the reporting and the comparative period is shown in the following overview.

Financial instruments as of December 31 2015 € k	Category as per IAS 39	Carrying amounts	Loans and receivables measured at amortised cost*	Available-for-sale financial assets recognised at fair value in comprehensive income	Financial liabilities measured at amortised cost*
ASSETS					
Non-current assets					
Securities	AfS	12,783		12,783	
Loans	LaR	165	165		
Receivables and other assets	LaR	2,459	2,459		
Current assets					
Trade receivables from third parties	LaR	160,780	160,780		
Receivables and other assets	LaR	14,118	14,118		
Cash and cash equivalents	LaR	84,277	84,277		
LIABILITIES					
Non-current liabilities					
Financial liabilities	FLAC	388			388
Trade payables to third parties	FLAC	47			47
Other liabilities	FLAC	2,642			2,642
Current liabilities					
Financial liabilities	FLAC	125			125
Trade payables to third parties	FLAC	29,090			29,090
Other liabilities	FLAC	141,572			141,572
Total by category as per IAS 39			**261,799**	**12,783**	**173,864**
Of which (aggregated by category as per IAS 39):					
Loans and receivables (LaR)		**261,799**			
Available-for-sale financial assets (AFS) Financial liabilities measured at amortised cost (FLAC)		**12,783**			
Financial liabilities measured at amortised cost (FLAC)		**173,864**			

* The carrying amount corresponds to the fair values.

Financial instruments as of December 31 2014 € k	Category as per IAS 39	Carrying amounts	Loans and receivables measured at amortised cost*	Available-for-sale financial assets recognised at fair value in comprehensive income	Financial liabilities measured at amortised cost*
ASSETS					
Non-current assets					
Securities	AfS	20,958		20,958	
Loans	LaR	178	178		
Receivables and other assets	LaR	2,018	2,018		
Current assets					
Trade receivables from third parties	LaR	140,134	140,134		
Receivables and other assets	LaR	8,266	8,266		
Cash and cash equivalents	LaR	61,607	61,607		
LIABILITIES					
Non-current liabilities					
Financial liabilities	FLAC	507			507
Trade payables to third parties	FLAC	318			318
Other liabilities	FLAC	3,603			3,603
Current liabilities					
Financial liabilities	FLAC	21,230			21,230
Trade payables to third parties	FLAC	20,813			20,813
Other liabilities	FLAC	117,182			117,182
Total by category as per IAS 39			**212,203**	**20,958**	**163,653**
Of which (aggregated by category as per IAS 39):					
Loans and receivables (LaR)		**212,203**			
Available-for-sale financial assets (AFS) Financial liabilities measured at amortised cost (FLAC)		**20,958**			
Financial liabilities measured at amortised cost (FLAC)		**163,653**			

* The carrying amount corresponds to the fair values.

As laid down in the three stages of the valuation hierarchy in IFRS 13.72 et seq., the valuation of financial assets and liabilities is subject to the availability of the relevant information. For the first stage, quoted market prices are directly observable for identical asset values and liabilities in active markets. In the second stage, the assessment is made on the basis of valuation models which are influenced by values that are observable on the market. The third stage envisages the application of valuation models that do not rely on observable market inputs.

No financial assets are held for trading or held to maturity.

In view of the predominantly short maturities of the assets and liabilities measured at amortised cost, it is assumed that their carrying amounts approximately correspond to their fair values.

For the securities classified as available for sale, the fair values are based on market prices quoted on an active market (level 1 of the fair value hierarchy).

Net profit or loss by category

Net profit or loss from financial instruments that is recognised in the Income Statement is allocated to the following categories:

	2015			2014		
€ k	**From interest**	**From subsequent measurement**	**From disposal**	**From interest**	**From subsequent measurement**	**From disposal**
Loans and receivables	1,979	-2,641	0	1,595	-2,011	-16
Financial liabilities measured at amortised cost	-1,472	135	0	-1,569	154	0

Interest on financial liabilities and impairment losses on loans granted are recognised in Financial items. Impairment losses on receivables (essentially trade receivables) and gains or losses from disposals of securities are recognised under Other losses or gains.

7.4. Management of financial risks

TÜV NORD group companies are exposed to financial risks in the course of their operations. These risks consist of credit, liquidity and market risks in the form of currency and interest rate risks. The risk situation has not changed in comparison to the previous reporting period.

Through TÜV NORD AG's centralised risk management system these risks are managed and controlled on a group-wide basis. The principles of the risk management system are explained in greater detail in the Management Report.

Credit default risks

Default risks arise in particular out of day-to-day operations. The receivables of TÜV NORD group companies are generally subject to a default risk which it may seek to counter by demanding security, depending on the type and amount of the performance rendered. Where required, credit insurance with an excess component is concluded in respect of individual counterparties. In addition, payment in advance may be required. In order to minimise the risk of default, counterparties are subjected to creditworthiness assessments in accordance with internal guidelines before contracts are concluded. Furthermore, customers' financial standing is regularly reviewed during the term of the contract.

If there is any concrete risk of default, precautionary write-downs are effected, on the basis of either objective evidence in specific cases or the structure of maturities and the actual occurrence of defaults on payment.

Defaults on trade receivables, on receivables based on percentage of completion and on loans cannot exceed their carrying amount as of December 31 2015. The structure of due dates of trade receivables is shown under 5.6.

The maximum credit risk relating to assets held for sale and financial instruments is equivalent to their market prices as of December 31 2015.

Liquidity risks

Possible liquidity risks – the danger that the group might not be able to meet its payment obligations at all times – are managed through the implementation of comprehensive short-term and long-term liquidity planning, taking into account existing credit lines. Funding requirements are for the most part covered by equity, by participation in cash pooling agreements or by loans from banks or from group companies, to the extent that this is feasible and reasonable in the context of the legal and tax situation in each case. Bank balances are held exclusively with banks of impeccable standing.

A variety of financing instruments available on the market are used to cover the group's central funding requirements. If events should occur that lead to an unexpectedly high requirement for liquidity, both existing liquidity in the form of cash and cash equivalents and available credit lines can be drawn upon.

A credit line up to a limit of €175,000k is available and can be drawn upon as required; the amount drawn down as of December 31 2015 amounted to €0k.

An overview of the maturities of financial liabilities and the resulting outflows of funds can be derived from the table of residual terms of liabilities (see under 5.13.).

Currency risks

Currency risks result from the assets and liabilities recognised in the balance sheet that are denominated in foreign currencies, the fair values of which may be negatively influenced by fluctuations in exchange rates, and from pending foreign currency transactions whose future cash flows may develop disadvantageously as a result of exchange rate movements.

Exchange rate risk is of only minor importance, since the receivables and payables are due in local currency in the country in which the company concerned is domiciled. There are scarcely any country risks at the present time.

Interest rate risks

Interest rate risks arise predominantly from short-term loans with variable rates of interest taken out in the context of group funding. TÜV NORD AG's risk and opportunity management system counters the risk that future interest payments may develop unfavourably as a result of changes in interest rate levels by adopting appropriate reporting practices and laying down competences and responsibilities with regard to the taking out of credit. No sensitivity analysis has been prepared, since current liabilities were essentially already covered at the time of the preparation of the financial statements.

7.5. Related party disclosures

Under IAS 24, Related party disclosures, companies are subject to an obligation to disclose relationships with, on the one hand, related business entities that are not fully consolidated, and, on the other, persons with whom a close relationship exists.

Related party entities of TÜV NORD group are basically the TÜV Nord e.V., TÜV Hannover/ Sachsen-Anhalt e. V. and RWTÜV e. V. associations, "Aktaios" Verwaltungs-GmbH and RWTÜV GmbH with its subsidiaries. For further information in relation to the registered debentures taken out with the associations, see section 5.10. Equity.

In addition, the group maintains direct or indirect relationships in the normal course of its business activities not only with its consolidated subsidiaries but also with non-consolidated affiliates and associates. All trading relationships entered into in the normal course of business with non-consolidated related entities are conducted on the basis of such normal market conditions as are also customary in arm's-length transactions.

Members of the Board of Management and the Supervisory Board are also considered to be related parties.

7.6. Total compensation of the Board of Management and the Supervisory Board

The compensation of the key management personel, the disclosure of which is required pursuant to IAS 24, embraces the compensation of the serving members of the Board of Management and the Supervisory Board.

During the 2015 fiscal year, the serving members of the Board of Management received total compensation amounting to €2,477k (2014: €1,858k). The additional current service cost for pension obligations amounts to €0k (2014: €175k). The present value of the overall defined benefit obligation (DBO) to the serving members of the Board of Management amounts to €3,903k (2014: €6,042k) as of the reporting date.

Total payments to former members of the Board of Management and their surviving dependents, consisting of pension payments and other compensation (one-off payments and payments for consultancy services), amounted to €404k (2014: €393k). A DBO in the amount of €10,206k (2014: €6,256k) exists for former members of the Board of Management and their surviving dependents.

Members of the Supervisory Board were paid compensation of €244k (2014: €243k) for their services.

As in the previous year, no loans or advances were granted to members of the Board of Management or the Supervisory Board in the 2015 fiscal year. As was also the case in the previous year, no severance payments were made.

7.7. List of shareholdings

Name, location of registered office	Share of equity %
Consolidated affiliates	
adapt engineering GmbH & Co. KG, Nordhausen, Germany	100.00 [1]
ALTER TECHNOLOGY TÜV NORD S.A.U., Seville, Spain	100.00
Asesoría y Control en Protección Radiológica, S.L. (ACPRO), Barcelona, Spain	60.00
BRTUV AVALIAÇÕES DA QUALIDADE S.A., São Paulo, Brazil	75.01
Cualicontrol-ACI S.A.U., Madrid, Spain	100.00
DMT Consulting GmbH, Essen, Germany	100.00
DMT Consulting Limited, Nottingham, United Kingdom	100.00
DMT Consulting Private Limeted, Kolkata, India	51.00
DMT GEOSCIENCES LTD., Calgary, Canada	100.00
DMT Geosurvey spol. s.r.o., Prague, Czech Republic	100.00
DMT GmbH & Co. KG, Essen, Germany	100.00 [1]
DMT Petrologic GmbH, Hanover, Germany	100.00
Dr.-Ing. Wesemann Gesellschaft für Ingenieurgeodäsie mbH, Herne, Germany	100.00
EE Energy Engineers GmbH, Gelsenkirchen, Germany	100.00
ENCOS GmbH & Co. KG (formerly: ENCOS GmbH Engineering + Construction + Service), Hamburg, Germany	100.00 [1]
FS FAHRZEUG-SERVICE GmbH & Co. KG, Hanover, Germany	100.00 [1]
Guangzhou TÜV Industrial Technical Services Co., Ltd., Guangzhou, China	100.00
GWQ GmbH & Co. KG (formerly: GWQ Gesellschaft für Werkstoffprüfung und Qualitätssicherung mbH), Moers, Germany	100.00 [1]
HIREX ENGINEERING SAS, Toulouse, France	100.00
Höntzsch GmbH, Waiblingen, Germany	75.08
Hundt & Partner Ingenieurgesellschaft mbH & Co. KG, Hanover, Germany	100.00 [1]
MEDITÜV GmbH & Co. KG – Unternehmensgruppe TÜV NORD, Hanover, Germany	100.00 [1]
Nord-Kurs GmbH & Co. KG, Hamburg, Germany	100.00 [1]
PT. TÜV NORD Indonesia, Jakarta, Indonesia	100.00
THE INSPECTION COMPANY OF KOREA (INCOK), Seoul, Korea	100.00
TOP REL S.R.L., Rome, Italy	100.00
TÜ-Service Anlagentechnik GmbH & Co. KG, Potsdam, Germany	100.00 [1]
TÜ Service Ingenieurgesellschaft mbH & Co. KG, Potsdam, Germany	100.00 [1]
TÜV ASIA PACIFIC LTD., Kwun Tong, Kowloon, Hong Kong	100.00
TÜV Croatia d.o.o., Slavonski Brod, Croatia	100.00
TÜV CYPRUS LTD., Nicosia, Cyprus	60.16
TÜV Eesti OÜ, Tallinn, Estonia	100.00
TÜV HELLAS (TÜV NORD) S.A., Athens, Greece	100.00
TÜV India Private Ltd., Mumbai, India	50.00
TÜV Informationstechnik GmbH Unternehmensgruppe TÜV NORD, Essen, Germany	100.00
TÜV Nederland QA B.V., Best, the Netherlands	100.00
TÜV NORD Akademie GmbH & Co. KG, Hamburg, Germany	100.00 [1]
TÜV NORD Austria GmbH, Vienna, Austria	100.00
TÜV Nord Baltik SIA, Riga, Latvia	100.00
TÜV NORD Bautechnik GmbH, Hamburg, Germany	100.00
TÜV NORD Bildung GmbH & Co. KG, Essen, Germany	100.00 [1]
TÜV NORD Bildung Opel GmbH, Bochum, Germany	80.40
TÜV NORD Bildung Saar GmbH, Saarbrücken, Germany	100.00
TÜV NORD Bulgarien GmbH, Plovdiv, Bulgaria	100.00
TÜV NORD CERT GmbH, Essen, Germany	94.00
TÜV NORD CERT UMWELTGUTACHTER Gesellschaft mbH, Hanover, Germany	100.00
TÜV NORD College GmbH, Essen, Germany	100.00
TÜV NORD Czech, s.r.o., Prague, Czech Republic	100.00
TÜV Nord Danmark ApS, Kolding, Denmark	100.00
TÜV NORD EnSys Hannover GmbH & Co. KG, Hanover, Germany	100.00 [1]
TÜV NORD Finland Oy, Vantaa, Finland	100.00
TÜV NORD Hangzhou Co., Ltd., Hangzhou, China	50.00
TÜV NORD HONG KONG LTD., Kwun Tong, Kowloon, Hong Kong	100.00

Name, location of registered office	Share of equity %
TÜV NORD Immobilien GmbH & Co. KG, Essen, Germany	100.00 [1]
TÜV NORD InfraChem GmbH & Co. KG, Marl, Germany	51.00 [1]
TÜV NORD INTEGRA BVBA, Berchem, Belgium	70.00
TÜV NORD International GmbH & Co. KG, Essen, Germany	100.00 [1]
TÜV NORD ITALIA S.r.l., Legnano, Italy	100.00
TÜV NORD Korea Ltd., Seoul, Korea	100.00
TÜV NORD (Malaysia) SDN. BHD., Petaling Jaya, Malaysia	100.00
TÜV NORD Mobilität GmbH & Co. KG, Hanover, Germany	100.00 [1]
TÜV NORD Mobilität Immobilien GmbH, Essen, Germany	94.00
TÜV NORD MPA Gesellschaft für Materialprüfung und Anlagensicherheit mbH & Co. KG, Leuna, Germany	100.00 [1]
TÜV NORD NC GmbH & Co. KG, Hanover, Germany	100.00 [1]
TÜV NORD Nederland Holding B.V., Rijswijk, the Netherlands	100.00
TÜV NORD Polska Sp. z o.o., Katowice, Poland	100.00
TÜV NORD Service GmbH & Co. KG, Hanover, Germany	100.00 [1]
TÜV NORD SLOVAKIA, s.r.o., Bratislava, Slovakia	100.00
TÜV NORD SOUTHERN AFRICA (PTY) LTD., Cape Town, South Africa	74.00
TÜV NORD Sweden AB, Gothenburg, Sweden	100.00
TÜV NORD SysTec GmbH & Co. KG, Hamburg, Germany	100.00 [1]
TÜV NORD Systems GmbH & Co. KG, Hamburg, Germany	100.00 [1]
TÜV NORD Technisches Schulungszentrum GmbH & Co. KG, Hamburg, Germany	100.00 [1]
TÜV NORD (Thailand) Ltd., Bangkok, Thailand	99.97
TÜV NORD Transfer GmbH & Co. KG, Essen, Germany	100.00 [1]
TÜV NORD Umweltschutz GmbH & Co. KG, Hamburg, Germany	100.00 [1]
TÜV Teknik Kontrol ve Belgelendirme A.S., Istanbul, Turkey	100.00
TÜV Thüringen Anlagentechnik GmbH & Co. KG, Erfurt, Germany	99.94 [1]
TÜV Thüringen Fahrzeug GmbH & Co. KG, Erfurt, Germany	99.50 [1]
TÜV UK Ltd., London, United Kingdom	100.00
TÜV USA, Inc., Salem, USA	100.00
Unterstützungseinrichtung des Technischen Überwachungs-Vereins Hannover/Sachsen-Anhalt GmbH, Hanover, Germany	100.00
Verebus Engineering B.V., Rijswijk, The Netherlands	100.00
Versicherungsvermittlung TÜV NORD GmbH, Essen, Germany	100.00
Unconsolidated affiliates	
adapt engineering Verwaltungsgesellschaft mbH, Nordhausen, Germany	100.00
British Mining Consultants Ltd., Sutton, United Kingdom	100.00
DMT-KAI BATLA (Mozambique) Limitada, Maputo Cidade, Mozambique	51.00
DMT-Kai Batla Pty. Ltd., Bordeaux, South Africa	51.00
DMT Mining Consulting Ltd., Nottingham, United Kingdom	100.00
DMT Verwaltungsgesellschaft mbH, Essen, Germany	100.00
ENCOS Verwaltungsgesellschaft mbH (former: IGN Verwaltungsgesellschaft mbH, Greifswald), Hamburg, Germany	100.00
FAHRZEUG-SERVICE Verwaltungsgesellschaft mbH, Hanover, Germany	100.00
FORMATION SaarLor FSL EURL, Forbach, France	100.00
GWQ Verwaltungsgesellschaft mbH (former: TÜV NORD Energieagentur Verwaltungsgesellschaft mbH, Essen), Moers, Germany	100.00
IMC Group Consulting Limited, Nottingham, United Kingdom	100.00
IMC Montan Consulting Limited, Nottingham, United Kingdom	100.00
IMC Montan Russia Limited, Nottingham, United Kingdom	100.00
International Mining Consultants Ltd., Nottingham, United Kingdom	100.00
International Mining Consultants Pty Ltd., Brisbane, Australia	100.00
MacKay & Schnellmann Ltd., Nottingham, United Kingdom	100.00
MEDITÜV Verwaltungsgesellschaft mbH, Hanover, Germany	100.00
Montan Consulting Limited, Nottingham, United Kingdom	100.00
MONTAN RUSSIA Ltd., Nottingham, United Kingdom	100.00
Nord-Kurs Verwaltungsgesellschaft mbH, Hamburg, Germany	100.00
PT. DMT Exploration Engineering Consulting Indonesia, Jakarta, Indonesia	74.00
RWTÜV Akademie GmbH, Essen, Germany	100.00
SEIQ – Serviços de Engenharia Industrial e Qualidade Ltda., Rio de Janeiro, Brazil	100.00

Name, location of registered office	Share of equity %
TN Portugal, Unipessoal Lda, Sines, Portugal	100.00
TÜ-Service Anlagentechnik Verwaltungsgesellschaft mbH, Berlin, Germany	100.00
TÜ Service Verwaltungsgesellschaft mbH, Potsdam, Germany	100.00
TÜV GmbH Hannover Hamburg Essen Berlin, Hanover, Germany	100.00
TÜV NORD Akademie Verwaltungsgesellschaft mbH, Hamburg, Germany	100.00
TÜV NORD ARGENTINA S.A., Buenos Aires, Argentina	100.00
TÜV NORD AUTO GmbH, Essen, Germany	100.00
TÜV NORD Bauqualität Verwaltungsgesellschaft mbH, Hanover, Germany	100.00
TÜV NORD Bildung Verwaltungsgesellschaft mbH, Essen, Germany	100.00
TÜV NORD Certification (Tianjin) Co. Ltd., Tianjin, China	76.90
TÜV NORD EGYPT S.A.E., Cairo, Egypt	60.00
TÜV NORD EnSys Hannover Verwaltungsgesellschaft mbH, Hanover, Germany	100.00
TÜV NORD FRANCE S.A.S., La Madeleine, France	100.00
TÜV NORD Immobilien Verwaltungsgesellschaft, Essen, Germany	100.00
TÜV NORD InfraChem Verwaltungsgesellschaft mbH, Marl, Germany	51.00
TÜV NORD International Verwaltungsgesellschaft mbH, Essen, Germany	100.00
TÜV NORD Kft., Budapest, Hungary	100.00
TÜV NORD Luxembourg s.a.r.l., Luxembourg, Luxembourg	100.00
TÜV NORD Material Testing GmbH, Duisburg, Germany	51.00
TÜV NORD MEXICO S.A. DE C.V., Querétaro, Mexico	100.00
TÜV NORD Mobilität Verwaltungsgesellschaft mbH, Hanover, Germany	100.00
TÜV NORD MPA Verwaltungsgesellschaft mbH, Leuna, Germany	100.00
TÜV NORD Philippines, Inc., Manila, The Philippines	100.00
TÜV NORD ROMANIA S.R.L., Bucharest, Romania	100.00
TÜV NORD Service Verwaltungsgesellschaft mbH, Hanover, Germany	100.00
TÜV NORD SysTec Verwaltungsgesellschaft mbH, Hamburg, Germany	100.00
TÜV NORD Systems Verwaltungsgesellschaft mbH, Hamburg, Germany	100.00
TÜV NORD Transfer Verwaltungsgesellschaft mbH, Essen, Germany	100.00
TÜV NORD TS Verwaltungsgesellschaft mbH, Hamburg, Germany	100.00
TÜV NORD Ukraina GmbH, Donetsk, Ukraine	100.00
TÜV NORD Umweltschutz Verwaltungsgesellschaft mbH, Hamburg, Germany	100.00
TÜV NORD VIETNAM LTD., Hanoi, Vietnam	100.00
TÜV Thüringen Anlagentechnik Verwaltungsgesellschaft mbH, Erfurt, Germany	99.60
TÜV Thüringen Fahrzeug Verwaltungsgesellschaft mbH, Erfurt, Germany	99.50
At equity accounted associates	
National Inspection and Technical Testing Company Ltd. (FAHSS), Damman, Saudi Arabia	25.11
OutSmart B.V., Velp, the Netherlands	25.10
TÜV Middle East Co. W.L.L., Manama, Bahrain	25.10
UAB TÜVLITA, Vilnius, Lithuania	50.00
Not at equity accounted associates (A) and joint ventures (JV)	
ARGE "Technische Prüfstelle für den Kraftfahrzeugverkehr 21" GbR, Dresden, Germany (JV)	25.00
EnergieAgentur.NRW GmbH, Düsseldorf, Germany (JV)	50.00
Energy Agency NRW GmbH, Düsseldorf, Germany (JV)	50.00
IMC MONTAN Ltd., Nottingham, United Kingdom (JV)	50.00
TÜV NORD ENGINEERING SERVICES (M) SDN. BHD., Selangor, Malaysia (A)	40.00
TÜV NORD IRAN JOINT VENTURE CO., Tehran, Iran (A)	49.00

Name, location of registered office	Share of equity %
Other investments	
Engineering Financial Cooperative, Seoul, Korea	0.02
FSD Fahrzeugsystemdaten GmbH, Dresden, Germany	13.43
Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH, Cologne, Germany	15.40
Korea Electric Engineers Association, Seoul, Korea	0.20
One TÜV BV Technische Inspektions GmbH i.L., Essen, Germany	33.33
Radiologic Facility Services S.A., Tarragona, Spain	20.00
VIA Consult GmbH & Co. KG, Olpe, Germany	2.50
WINDTEST Grevenbroich GmbH, Grevenbroich, Germany	12.50

1) These trading partnerships take advantage of the exemption rule pursuant to Art. 264b HGB

Members of the Board of Management:

Dr.-Ing. Guido Rettig, Hanover
Chairman and CEO,
Natural Resources and Aerospace
business units

Dipl.-Kfm. Jürgen Himmelsbach, Essen
(as of September 1 2015)
CFO

Dr. rer. nat. Klaus Kleinherbers, Buxtehude
Mobility business unit

Dr. rer. pol. Elmar Legge, Schermbeck
(until August 31 2015)
CFO

Harald Reutter M.A., Berlin
Labour Director and Training business unit

Dr. rer. nat. Dirk Stenkamp, Bocholt
Industrial Services and IT business units

Members of the Supervisory Board:

Dr. rer. nat. Georg Schöning, Rosengarten-Nenndorf
Chairman

Dipl.-Ing. Albert Veldmann*, Nordhorn
1st Vice Chairman (until December 31 2015)
Officially recognised expert, Member of
group Staff Council of TÜV NORD AG

Dipl.-Ing. Rüdiger Sparfeld*, Hanover
Deputy Vice Chairman (as of January 1 2016)
Vice Chairman of group Staff Council of TÜV NORD AG

Prof. Dr. Karl Friedrich Jakob, Dinslaken
Vice Chairman
Chairman of the Board of Directors of RWTÜV e.V.

Peter Bremme*, Hamburg
Vice Chairman
Regional representative ver.di trade union,
Hamburg region

Dr.-Ing. Klaus-Dieter Beck, Cologne

Prof. Dr.-Ing. Hans-Jürgen Ebeling, Peine

Dipl.-Ing. Christine Flöter*, Detmold
Technical employee, TÜV NORD CERT GmbH

Dr. Wolfram von Fritsch, Hanover
Chairman of the Board of Management of
Deutsche Messe AG

Prof. Dr.-Ing. Heinz Jörg Fuhrmann, Salzgitter
Chairman of the Executive Board, Salzgitter AG

Dipl.-Ing. Raimund Gemballa*, Münster
Chairman of Group Staff Council of TÜV NORD AG

Ludger Halasz*, Duisburg
Head of Human Resources of TÜV NORD AG

Kurt Hay*, Herne
Regional Director of IG BCE, Westphalia Region

Dr. jur. Jürgen-Johann Rupp, Dinslaken
Member of the Executive Board,
RAG Aktiengesellschaft

Dipl.-Ing. Stephan Schaller, Munich
Head of Motorcycles, BMW Group

Barbara Schipp*, Dortmund
(as of June 1 2015)
Secretary to the ver.di trade union

DV-Kfm. Michael Schnoor*, Tornesch
Chairman of the Joint Staff Council of TÜV NORD
Systems GmbH & Co. KG/TÜV NORD SysTec
GmbH & Co. KG Augsburg-Berlin-Greifswald-Hamburg

Prof. Dr. Peter Schörner, Bochum
Lecturer at EBZ BUSINESS SCHOOL

Uwe Schulze*, Buchholz/Nordheide
Chairman of the Joint Staff Council of
TÜV NORD AG/TÜV NORD Service GmbH & Co. KG
Hamburg-Bremen-Kiel

Regina Sparfeld-Möbus*, Schwerte
(until May 31 2015)
Secretary to the ver.di trade union

Dipl.-Ing. Lothar Velde, Köthen
Consultant of the General Management
of VKK Standardkessel Köthen GmbH

* Employees' representative

PUBLISHED BY

TÜV NORD GROUP
Am TÜV 1
30519 Hanover
GERMANY

Telephone +49 511 998-0
Fax +49 511 998-61237

info@tuev-nord-group.com
www.tuev-nord-group.com

CONTACT:

Corporate Communications
Telephone + 49 511 998-61540

CONCEPT AND DESIGN

TÜV NORD AG
Am TÜV 1
30519 Hanover
GERMANY

JDB MEDIA GmbH
Schanzenstraße 70
20357 Hamburg
GERMANY

PRINTING

Ortmeier Medien GmbH
Boschstraße 38
48369 Saerbeck
GERMANY

TRANSLATION, ENGLISH EDITION

Jonathan Bruton,
Shrewsbury, UK

MIX
Paper from responsible sources
FSC® C012379

ClimatePartner°
klimaneutral
Druck | ID: 10657-1405-1001

PICTURE REFERENCES & ILLUSTRATION

alphaspirit/fotolia (p. 7)
Martin Bühler (p. 13, 30, 31)
Fraunhofer-Institut für Fertigungstechnik
und Angewandte Materialforschung
IFAM, Bremen (p. 26)
Ferrari Press Agency/action press (p. 28)
Udo Geisler (p. 11, 19)
Google/dpa (p. 28)
gui yong nian/fotolia (p.23)
kalafoto/fotolia (p. 27)
Izabela Habur/iStock.com (p. 35)
Hauke Hass (Cover, p. 3, 10, 11, 13, 15, 16, 17, 32, 33)
Mourad Kechar (p. 3, 11, 20, 21)
Debbie Jane Kinsey (p. 4)
Mike_Kiev/iStock.com (p. 36)
Prof. Dr. Gerhard Roth (p. 34)
Henning Scheffen (p. 3, 7, 12, 13)
svedoliver/iStock.com (p. 10, 37)
Syda Productions/iStock.com (p. 29)
Paul Taylor/Getty Images (p. 28)
Toverland (p. 18)

WE WOULD LIKE TO THANK THE FOLLOWING FOR THEIR SUPPORT

BMW subsidiary Hanover
Prof. Matthias Busse, Fraunhofer-Institut für Fertigungstechnik
und Angewandte Materialforschung IFAM, Bremen
Toverland leisure park, Sevenum, the Netherlands
PCK Raffinerie GmbH, Schwedt/Oder
Dr Gerhard Roth, University of Bremen
Zonergy

OUR TITLE PAGE SHOWS

a lift tester, whose work is being supported by a tablet computer. With the aid of this modern technology parameters can be recorded and defects detected. The technology is being tested at present.

TÜV NORD GROUP

Excellence for your Business

TÜV NORD AG
Am TÜV 1
30519 Hanover
GERMANY

Telephone +49 511 998-0
Fax +49 511 998-61237

info@tuev-nord-group.com
www.tuev-nord-group.com

01-0043-04/16