

# SPEKTRUM



## LEADING EMPLOYERS

ESG is in the top 1%  
in Germany

## AGAIN IN 2019

ESG is top4women



# EDITORIAL

## Spektrum I 2019

### Increasing agility – acting for customers – creating real added value

We have got the new year off to a dynamic start. Numerous projects have been successfully executed and lots of exciting challenges tackled.

The organisational development of the ESG Group is also bearing fruit. Together with our dedicated team, we are demonstrating a new type of agility and designing pioneering innovation projects for our customers with an even greater target focus.

We are delighted with the appointment of Dr. Mihaela Seidl as Managing Director of ESG GmbH from May 1 and look forward to her providing further impetus for the ESG Group's current successful growth as Chief Financial Officer.

There is no doubt that our strategy of consistently putting you, our customers, with all your individual needs and requirements, at the heart of everything we do creates real added value.

We are on this journey together with you, ensuring security and mobility in a connected world, resolving the challenges for ready-to-use systems, providing a system for moving visions, and exploiting and protecting the value potential of data. The articles in the spring issue of our corporate magazine Spektrum show the diversity our portfolio of services has to offer and highlight our dedication to our customers' well-being.

We hope you enjoy reading it and look forward to discussing the issues of the future with you.



Jörg Ohlsen  
Managing Director

Dr. Mihaela Seidl  
Managing Director

Kai Horten  
Managing Director



## CONTENT

- 02 **Editorial**  
Spektrum I 2019
- 04 **Again in 2019**  
ESG is top4women
- 06 **Host nation support**  
ESG and WGS – strong partners!
- 08 **Leading employers**  
ESG is in the top 1% in Germany
- 09 **HAI Heli-Expo 2019**  
ESG impresses on an international stage
- 10 **France says "Oui" to ESG**  
N-CORE impresses the Ministry of Defence
- 11 **Drone detection and defence**  
Another international order gained
- 12 **Information Mediation Service**  
ESG hands over the keys to interoperability
- 13 **Swiss Army picks ESG in type selection**
- 14 **Sustainability in mobility**  
Four reasons why it is becoming a must
- 16 **Agile and close to the customer**  
ESG MOBILITY celebrates new office in Ingolstadt
- 18 **Transfer potential from aerospace and automotive**  
How mobility can be reinvented
- 21 **Parking space reservation system for trucks**  
ServiceXpert presents truck2park.de at bauma
- 22 **Consistent display texts in more than 35 languages**  
ServiceXpert develops translation tool for Miele
- 24 **Malicious virus uncovered**  
Patient hospital in a stable condition
- 26 **Security of IT and OT**  
Humans as the critical factor in the success of the digital transformation
- 29 **Risk management**  
The strategic control instrument

### Legal notice

#### Publisher:

ESG Elektroniksystem- und Logistik-GmbH  
Livry-Gargan-Straße 6, 82256 Fürstentfeldbruck  
Tel.: +49 89 92161 2850  
www.esg.de

#### Responsible for content:

Ulrich-Joachim Müller, Corporate Communication  
**Design:** Agentur 22 Werbe GmbH, Munich  
**Photos:** ESG, Fotolia, Getty Images  
**Print:** Blueprint AG, Munich

# AGAIN IN 2019 ESG is top4women



For the third year in a row, our company has been awarded the quality mark top4women.



As a company, we want to incorporate diversity into our everyday working lives as much as possible and to make use of the opportunities it brings. A company like ESG, whose success relies on the creativity and problem-solving skills of its employees, will only continue to enjoy success on the market in future if diversity is valued and demonstrated in every project and division.

The top4women mark is a way for us to show everybody, both inside and outside the company, how important the issue of “women and careers” is to us. We are taking new measures to enable women (and men) to balance work and family life, while also promoting careers based on each person’s phase of life.

Together, we are developing ESG’s image and adding new facets – not least to boost our attractiveness and competitiveness as an employer in the long term. A selection of current topics:

- » Our clear aim is to increase the proportion of women at ESG both overall and in responsible positions and management roles. To do this, we want to encourage more women (high school students, graduates, women with professional experience, managers) to join ESG.
- » It is very important to us that ESG colleagues develop in line with their plans and potential, so that they can ultimately adopt the responsible positions they deserve. We are therefore focusing on ensuring that the proportion of women is also reflected in our internal ESG development and young talent programmes.
- » As active participants in TUM Munich’s Mentoring programme, we advise graduates in MINT subjects on job applications, launching a career, career development and work-life balance.
- » We provide funding to students in a technical field as part of the Deutschlandstipendium bursary programme.
- » We offer a very popular training course especially for our female staff of any age, hierarchical level and role. In it, the women reflect on their role as women in a male-dominated environment, determine their personal impact and position, learn about clarity of communication, and receive the tools they need to deal with difficult situations. The aim of the course is to encourage the participants to be proactive in planning and advancing their own careers.
- » Establishment of an additional communication platform targeted at women: Women@ESG
- » Our staff can contact an external family service (ESG cooperation partner) at any time, for example if they need support with childcare, caring for dependent relatives, or emergency care. The parents among our staff value this service highly and use it a great deal.
- » Even more flexible working hours and introduction of working@home
- » Since 2018, we have provided company childcare during the summer holidays.



1 Left to right: Geir Michaelsen (WGS), Vidar Hole (WGS), Erhard Hergesell (ESG), René Kleint (ESG)

# HOST NATION SUPPORT ESG and WGS – strong partners!

On 14th February, Erhard Hergesell and René Kleint welcomed the CEO of the Norwegian company WilNor Governmental Services (WGS), Vidar Hole, and its CCO, Geir Michaelsen, to the ESG headquarters to seal the future collaboration of the two companies with an agreement.

Host nation support (HNS) describes the support of foreign military forces in Germany. Where there is an exercise in or transit through Germany, Germany is the host nation.

HNS means that foreign military forces are supported with official and logistical services (e.g. entry permits,

refuelling, accommodation etc.) during their stay in Germany. These HNS services are coordinated by the Bundeswehr (German military). Foreign military forces make numerous requests for support every year, of varying scope and complexity.

The issue of host national support, which is based on a NATO Standard, is not new for ESG. In January last year, colleagues from ESG attended the opening event of the Bundeswehr's logistics corps on the topic of "cooperation in logistics". As part of this workshop, the Bundeswehr is looking to collaborate more with industry in order to provide secured logistics services in future, especially in the field of host nation support.

Large-scale NATO manoeuvres also always require HNS services from the host nation, for example NATO's recent Trident Juncture manoeuvre in Norway. The Norwegian armed forces used the HOBS (Host Nation Support Ordering and Billing System) software to manage the services needed from industry as part of host nation support.

HOBS was developed by WGS especially for the future HNS services of the armed forces during TRJ 18. The system had proved its practicability a year earlier in various small manoeuvres; it can be used universally to provide, manage and bill HNS services.

Intensive workshops together with WGS enabled ESG to get an idea of the performance of HOBS and the HNS support services on site. Both HOBS and a cooperative management service conducted together with the armed forces were found to be critical success factors in future HNS services within Germany.

Collaboration between WGS with its practical experience in Norway and ESG with its profound understanding of the Bundeswehr's logistics system and extensive experience in integrating and managing logistics processes was a useful and logical step – one that was taken with the signing of an exclusive collaboration agreement.

As well as WGS, further partners from the fields of rescue, evacuation and immediate service, as well as service stations, have been successfully acquired. They will support ESG in its planned future role within the HNS and ensure "first hour" services.

There is huge interest in collaboration between the Bundeswehr and industry for HNS, as seen by the high levels of industry participation in information events and workshops together with the Bundeswehr.

The topic of HNS is also attracting a lot of attention at more specific events, such as the logistics user forum Log.NET 2019. ESG also presented its HNS concept to an expert audience from the military and business at the user forum. The questions and reactions this provoked showed that ESG and its partners are on the right path towards a complete concept as a full service provider for HNS and has already attracted attention among armed forces in neighbouring countries. As extensive logistics services are needed in HNS, ESG invites interested companies to discuss the contribution they can make to the conceptual approach to HNS.



# LEADING EMPLOYERS

## ESG is in the top 1% in Germany

Exciting innovations, space for personal development, collegiality and shared values are a model of success that breeds satisfaction.

ESG is among the Leading Employers of 2019 – the top 1% of employers in Germany. This is verified by the independent study “Leading Employers”, which scientifically analysed more than five million data sets regarding employer quality and employee attractiveness in employee services, employee satisfaction, prosperity, corporate values, HR expertise and image. More than 70,000 companies of varying sizes and sectors were examined, with only around 600 receiving the famous award.

The Leading Employers study is known for its holistic appraisal of the employers. The key factors that make companies attractive to employees include job security based on economic and innovative strength, sustainability, additional services like company sport or can-

teens, opportunities for connection, recommendations by third parties, equality and respect, and individual services for work-life balance.

## RESPECT, JOY AND PASSION for innovations

ESG has been working hard for its employees in all these fields for many years, offering an above-average range of services. The ESG team’s shared success is based on mutual respect and the joy and passion for innovation.



# HAI HELI-EXPO 2019

## ESG impresses on an international stage

The HAI Heli-Expo, the leading trade fair for producers, operators and suppliers of civilian and official helicopters, was held in Atlanta, USA, from 5th to 7th March.

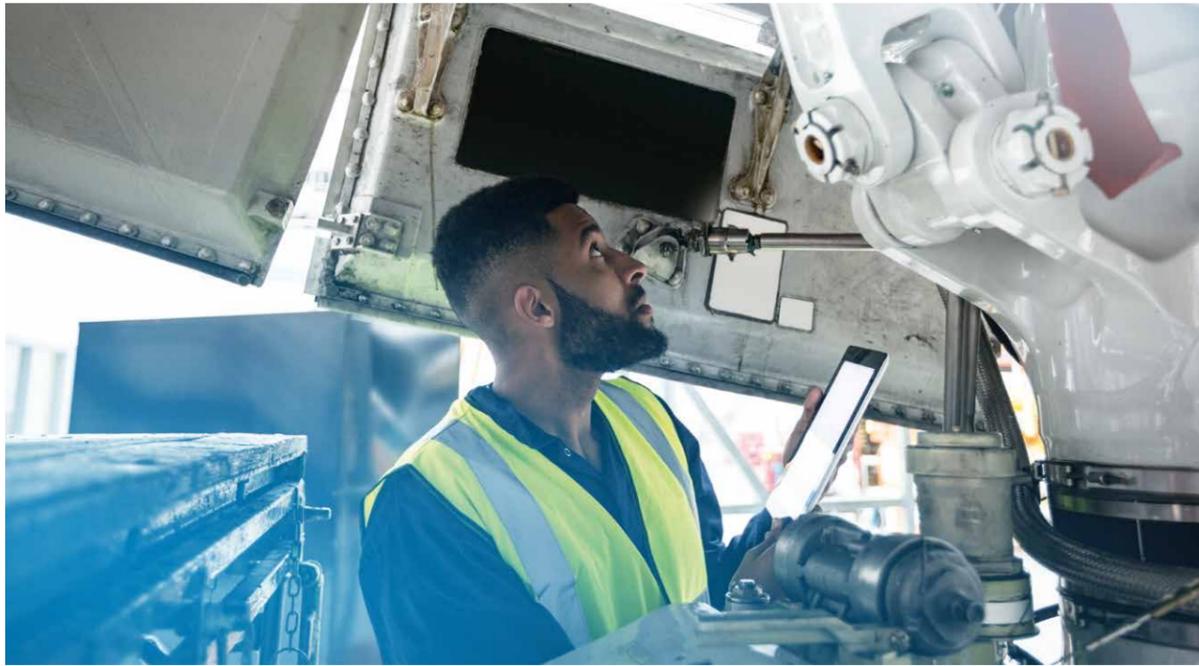
ESG had its own booth once again this year, showcasing its portfolio of services for helicopter systems to the trade visitors. Its focuses included the mission management system for military users

and police authorities developed by ESG, the latest generation of police tactical workplace, PTANG, and product support services.

The warm reception and great interest of the visitors to the ESG booth proved once again ESG’s internationally recognised position as a technology and innovation partner.



1 Pleased with the reception at HAI Heli-Expo 2019: Rolf Berger and Thomas Durmann



## FRANCE SAYS "OUI" TO ESG

### N-CORE impresses the Ministry of Defence

**ESG DEFENCE + PUBLIC SECURITY has gained another international key account with its state-of-the-art codification solution.**

The French Ministry of Defence has commissioned ESG to take responsibility for codifying the entire material inventory. This future service delivery centres around the N-CORE (NATO Codification System Repository) software developed by ESG.

During the international tender process, the French Ministry of Defence was particularly impressed with N-CORE's user friendliness and future-proof technological performance.

N-CORE is the world's leading codification solution in accordance with the NATO standard NCS (NATO Codification System). The NATO Codification System is a uniform system for the identification, classification and inventory numbering of material. It enables maximum efficiency in logistical support and managing huge pools of often highly complex material data. N-CORE is currently the only codification system in the world to be used successfully by both state and industrial customers.

More information:  
[www.NCORE.esg.eu](http://www.NCORE.esg.eu)



## DRONE DETECTION AND DEFENCE

### Another international order gained

**ESG DEFENCE + PUBLIC SECURITY has enjoyed another success on the international market with its complete system for airspace security.**

Shortly after procurement of a complete drone detection and defence system by a Belgian partner company for the European market, Rohde & Schwarz commissioned another complete system for drone detection and defence for a government client on the non-European market.

Following the successful acceptance of a complete system for a government client outside Europe at the start of the year, this is the next system on the international market that covers the entire effect chain, from reliable detection to situation picture display and effective,

integrated defence measures. The platform selected here is also a hybrid deployment made up of deployable box systems. The client can install the platform in vehicles for transportation.

This commission is further proof of the excellent performance of ESG and its technology partners for reliable protection against hazards from uncooperative drones, in particular in the field of critical security infrastructure.

Find out more at:  
[www.Drohnenabwehr.de](http://www.Drohnenabwehr.de)

# INFORMATION MEDIATION SERVICE

## ESG hands over the keys to interoperability

**IMS enables Lithuania's armed forces to achieve interoperability with the multinational NATO Enhanced Forward Presence Battlegroup.**

In early February, Lithuania's armed forces took over the Information Mediation Service (IMS) software developed by ESG DEFENCE + PUBLIC SECURITY from the Bundeswehr. For the first time, a consistent situation picture can now be guaranteed at all command levels for all nations involved in an enhanced forward presence. This is a key step towards comprehensive interoperability of the troops deployed, significantly increasing their abilities and deployment value.

As the lead nation, Germany has held responsibility for the multinational task force in Lithuania since February 2017. Guaranteeing sufficient interoperability between the nations involved was a significant challenge from the start.

In a demonstration on the ground in May 2017, ESG proved that the Information Mediation Service it developed can ensure precisely the ability required,

out of the box. In late 2018, ESG DEFENCE + PUBLIC SECURITY was commissioned to deliver the Information Mediation Service based on a government agreement between Lithuania and Germany by the NATO Support and Procurement Agency (NSPA).

ESG's IMS is a standalone service that ensures collaboration between different management systems via international interfaces and both proprietary and national special solutions. For the first time, it makes it possible to connect multiple nations at the same time via different standards, thus creating a shared situation picture.

The commissioning of ESG DEFENCE + PUBLIC SECURITY once again underlines the high performance of the products and solutions from this specialist in modern, user-orientated and comprehensively interoperable battle management systems.

## CONNECTING MULTIPLE NATIONS with different standards

# SWISS ARMY PICKS ESG IN TYPE SELECTION

**The ESG solution "TARANIS® Swiss Mortar System", based on the command & control system ADLER III, has proved itself as a fire control system for the Swiss "8.1cm Mörser 19" in the type selection.**

Following an intensive selection process in the "8.1cm Mörser 19" project, the Swiss Army, represented by armasuisse, chose the TARANIS® Swiss Mortar System (TSMS) solution developed by ESG as its future fire control system.

TSMS is based on the German Artillery's command & control system ADLER III, which has proved itself in decades of use by the Bundeswehr.

ESG and its system won the day after a comprehensive two-year evaluation (including field tests) in competition with systems from other manufacturers. TSMS ensures effective digital connection between observation, fire control, guidance and the "8.1cm Mörser 19" weapons system.

The system stands out thanks to the flexibility it offers for incorporating various sensors, such as thermal imaging and laser range finders, both with cables and wirelessly, as well as various means of communication.

The type selection decision made by the Swiss Army's procurement body, armasuisse, is further proof of ESG's high performance in the fields of joint fire support and battle management systems.





# SUSTAINABILITY IN MOBILITY

## Four reasons why it is becoming a must

Vehicle drives will have to change in the future if they are to meet the wide range of demands from society, the environment and policy makers. Find out here which global and local challenges mobility will need to face and which role electric drives will play.

### 1 Increasing need for mobility

With the world's population constantly increasing, the need for mobility is also rising, as more people need more vehicles. It is also increasingly common for households to have more than one vehicle. This increases the number of vehicles that pollute the air in cities every day and cause rising CO<sub>2</sub> emissions. Alternatives are needed to combat this pollution.

### 2 Growing environmental awareness

People are becoming increasingly aware that protecting the environment is a top priority. Mobility is therefore increasingly focused on finding sustainable solutions that do not pollute the environment. In order to meet the growing demand, vehicle manufacturers need to rethink their approach and work to develop alternative drives.

### 3 Limited raw materials

Supplies of raw materials are limited, yet the need for mobility continues to grow. This will push up prices for petrol and diesel. As a result, society will demand other solutions that also fit in with increased environmental awareness.

The finite nature of fossil fuels will force changes in the way we generate electricity. Even today, the CO<sub>2</sub> emissions caused by combustion processes indicate that conventional power generation cannot continue. Instead, regenerative energy sources will need to be expanded in future, not least in order to supply electricity to alternative drives such as electromobility.

### 4 Climate change

Last but not least, climate change will present huge challenges for society, business and policy-makers. As part of the Paris Climate Agreement, the German Federal Government pledge to reduce CO<sub>2</sub> emissions by 80 to 95 percent compared to 1990. Achieving that will require a huge change in mobility solutions. Alternative drives, such as electric drives, will play a crucial role here.

### Electromobility as a solution

Electric drives are a sustainable and environmentally friendly mobility solution. Combined with regenerative power generation, electric vehicles emit significantly less CO<sub>2</sub>. This reduces dependency on fossil fuels and protects the climate and environment.

Successfully implementing electric vehicles with their various components, systems and services demands a great deal of experience and specific expertise. ESG succeeded in acquiring both in its own field trials more than ten years ago. Since then, we have incorporated our profound knowledge into the design of sustainable mobility solutions in pioneering and purposeful ways.



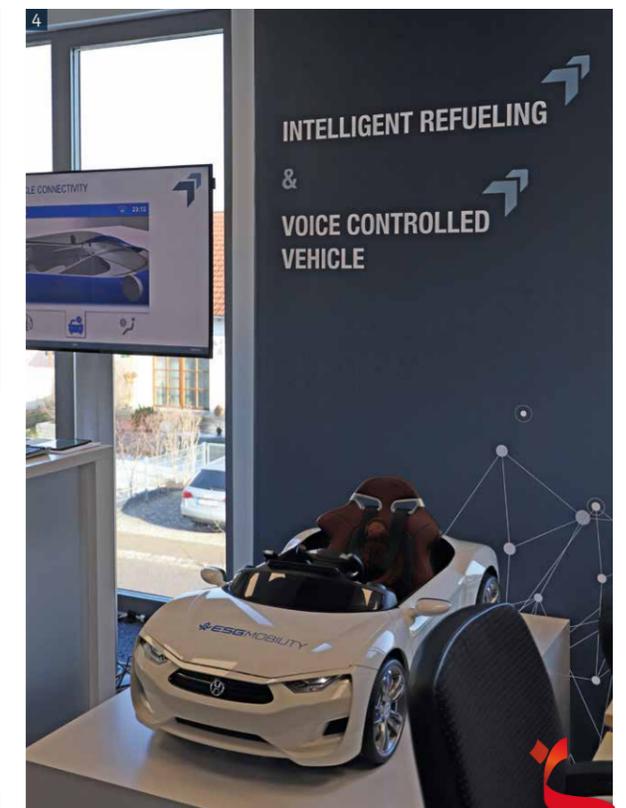
# AGILE AND CLOSE TO THE CUSTOMER

## ESG MOBILITY celebrates new office in Ingolstadt

Space for agile projects and growth in direct proximity to customers and partners – these are the excellent conditions under which intensive discussion began even at the opening event.

In February, the Regional Manager for Ingolstadt, Ulrike Hlawatsch, joined the Mayor of Gaimersheim, Andrea Mickel, the landlord, Lacy Tadeusz, and the CEO of ESG Mobility GmbH, Jörg Ohlsen, to officially open the new office. Bright sunshine and a sky of ESG blue provided the ideal backdrop for the official launch of a successful future at the Ingolstadt site.

“Close to the customer, modern and with space for further growth – the new office clearly reflects our innovative strength and our passion for technology,” said Jörg Ohlsen at the opening. Ulrike Hlawatsch added: “The modern office concept encourages the new way of working in agile project teams. It is fun and boosts our team spirit – we are putting this to good use in future projects for the mobility of tomorrow.”



Numerous customers and partners from the local area took up our invitation. After the official opening, many guests used the opportunity to find out more about the ESG MOBILITY portfolio and to network. An accompanying exhibition on exciting topics from fields such as ASAS, Connectivity, E-mobility and Industrial Control Systems provided plenty of food for intensive discussions.

- 1 Official opening of the new ESG MOBILITY office
- 2 The team looks forward to exciting topics and projects.
- 3 Jörg Ohlsen presents ESG MOBILITY's revolutionary visions.
- 4 An interesting exhibition for the visitors.
- 5 Here's to even more success for ESG MOBILITY in the future!

# TRANSFER POTENTIAL FROM AEROSPACE AND AUTOMOTIVE

## How mobility can be reinvented

At first glance, modern aerospace seems to have little in common with the automotive industry. Let's take a closer look!



Looking at key indicators like the length of development cycles, number of employees, turnover or price per product, the differences are often enormous. But both sectors centre around highly complex technologies and increasingly connected (embedded) systems. At the same time, the road to the mobility of the future leads through ever deeper integration of the two worlds – to mobility in every dimension.

### FUNDAMENTAL POTENTIAL FOR SYNERGY AND TRANSFER

If we are to meet the challenges of a connected and globalised world, mobility needs to be considered more and more as a whole. Potential for synergy and transfer between the aerospace and automotive sectors needs to be identified and used for mobility in a targeted way.

Both application cases focus on means of transport with often highly complex functions. These functions are implemented as embedded systems based on electronics and software, and often have to meet critical real-time requirements. Integration into complex traffic control is also comparable. From an engineering point of view, the domain structures from the bodywork and cockpit, drive and platform control are also very similar.

There is no doubt that the specific functional requirements and thus the solutions found are fundamentally different in most cases, but there is also a great deal of overlap, especially in the processes and the transferability of fundamental approaches and technological solutions.

The common denominator thus lies primarily in the approaches to finding solutions – in other words, in engineering. Some examples: Functional reliability essentially refers to the approach used to turn the prescribed requirements into a functionally reliable

product. This process is largely separate from the domain. It is a similar story in requirements management, where the same standard tool can also be used. Even in the more technical aspect of the system architecture, the essential solution approaches are transferable.

### THE RIGHT WAY TO TRANSFER PROCESSES

There are a few fundamental differences between aerospace and automotive that stand in the way of “simple” transferability: development time, speed of innovation, quantities, costs and the service life of the product. Despite this, the process steps in electronics and software development are comparable in the two industries. Taking these similarities as a starting point, there are certainly promising footholds for the automotive industry.

The increasing importance of software in vehicles calls for a software development process that is as efficient as it is robust. More and more functions have to be implemented in ever shorter periods by ever more players, taking into account ever more complex constraints.

The enormous complexity of processes and methods this creates can only be managed if the development steps interlink seamlessly in the network of vehicle manufacturers, suppliers and service providers and the division of tasks is clearly defined and transparent for everyone involved. Interface standardisation is a key measure in this regard.

The aerospace industry has long known of and acted upon the benefits of standardising non-differentiating technical solutions. Digitalisation of cars has advanced with an enormous speed of innovation in recent years through the extensive use of electronics and software. As a result, the system complexity of a premium automobile with all its variants is now greater than that of a modern transport plane – at least based on the total

amount of software and data involved. The kind of standardisation seen in the aerospace industry is one way to remove some of the complexity from the development process: a example the automotive industry could follow!

**TECHNOLOGY TRANSFER – EXPERIENCE ADDS VALUE**

We have seen that the technological principles are comparable (processors, programming languages, sensors, actuators etc.) – yet identical transfer of technologies is not realistic and cannot lead to sweeping success. What does make sense is a ‘transfer of experience’ when solving problems, such as in system and support functions (operating functions such as control, monitoring and guarantee of system operation, or administrator functions such as supporting development, production and service processes).

It is a similar story for basic functions at application level, such as sensor and data fusion, system status recording, environment recognition, central system coordination, and manoeuvre support and execution.

**TOP-DOWN ARCHITECTURE DEVELOPMENT – HOLISTIC UNDERSTANDING OF THE SYSTEM IS NEEDED**

We have now seen a drastic technological paradigm shift – away from conventional mechanical engineering and towards electronics, embedded systems and IT. Yet new and futureproof solutions are still needed as a result of the electrification of the drive, the still rapidly growing use of software, the enormous range of different, new and highly connected assistance systems, some already equipped with elements of artificial intelligence, and the blurring of system boundaries by cyber-physical systems.

A holistic understanding of the system during the development process is both a requirement and an indication of this.

Already established in the aerospace industry, the highly developed top-down architecture develop-

ment process sets an example here. The determining elements of this process are standardisation, harmonisation of interfaces, and abstraction of technological detailed solutions. A central aspect: safety and security can only be “produced” truly usefully on the architecture side. The same goes for system verification, which also benefits from a strict approach to the architecture.

Although this is only possible to a very limited extent at sub-system and component level, it still involves an enormous workload. Safety and security are indivisible and must therefore be designed as a whole in terms of architecture. With its focus on highly reliable systems and secure functions based on experience, the aerospace industry can act as an example here.

Such high standards involve a great deal of hard work, but the benefits are tangible: in terms of technology, function, process and, we are convinced, cost!

**TECHNOLOGY, FUNCTION, PROCESS and cost**

# PARKING SPACE RESERVATION SYSTEM FOR TRUCKS

## ServiceXpert presents truck2park.de at bauma

At bauma 2019, ServiceXpert GmbH, a 100% subsidiary of ESG Mobility GmbH, presented the truck2park reservation portal to the public for the first time.

The truck2park.de portal enables transport companies to make reservations at service stations with limited parking spaces. This means that truckers no longer have to endure the stressful search for a parking space, optimizing driving times and making transport logistics even easier to plan.

With 18 sites, Euro Rastpark GmbH & Co. KG is currently Germany's largest private service station provider. When it came to developing the truck parking space reservation system, Euro Rastpark chose ServiceXpert Gesellschaft für Service-Informationssysteme mbH as a flexible, reliable and expert system partner. In order to achieve maximum availability and IT security, the portal is hosted by ESG GmbH's IT Services department.

Pilot operation began in April 2019 at Euro Rastpark's Himmelkron service station and will continue for several months. Further service stations will be equipped with the system one by one, in a roll-out planned to end in mid-2020.





# CONSISTENT DISPLAY TEXTS IN MORE THAN 35 LANGUAGES

## ServiceXpert develops translation tool for Miele

As production cycles become ever shorter, the new translation tool efficiently assures language quality in all Miele models.

Premium household appliances today offer end customers numerous functions, which of course require a choice of language. The world's leading provider of premium-segment household appliances, Miele & Cie. KG, therefore commissioned the engineering service provider ServiceXpert Gesellschaft für Service-Informationssysteme mbH, a 100% subsidiary of ESG Mobility GmbH, to develop the new translation tool needed to achieve this.

The task was to design and implement an innovative management tool for translating display texts that could replace the existing translation tool, which had already been in use for more than ten years. Due to the ever shorter production cycles for new models, high-quality, consistent translations can only be achieved using a tool. Miele supports more than 35 languages in its devices, many of which, like bidirectional Arabic, present unique challenges for the tool. As a large translation project can have up to 4,000 reference texts, the individual functions of the new language tool were coordinated in detail in close cooperation with Miele and the key translators right from the concept phase. Following an intensive develop-

ment and test phase, the application could be adopted in Miele's productive operations.

The translation tool runs as a web application on a central server and is accessed via a browser. Using a web application means that no software has to be installed on the user PCs. The translations are saved centrally in a database and new translation projects integrated into this database via an import interface based on XML and Unicode formats. Existing projects can also be updated through additive imports. During such imports, projects cannot be edited. Translated texts can be exported in XML or Unicode formats for further processing in the next step.

The engineers at ServiceXpert have also developed additional components for tracking deadlines and translation costs. This translation management is based on a role concept equipped with a total of nine roles. The various roles can be used to control project access, read and write access, and the scope of functions, allowing deployment of the translators to be planned extremely flexibly in the various translation projects. The language tool generates billing-related data automatically for the individual subjects, so that the translator can see an overview of his current projects on the homepage and the project-specific deadlines with the respective translation status.

When translating display texts, it is important to remember that only a limited number of pixels is available on the display. Every pixel counts if the entire text is to be shown on the display as required. Automatic pixel length calculations and visual display for the translator are therefore a key part of the translation process. The ability to modify settings – such as adding new languages, activating alternative text markups or modifying permissions for certain projects – quickly and easily is also important.

ServiceXpert also implemented a bidirectional communication channel to enable multiple translators to work on a translation project at the same time. The server recognises changes made by a translator and distributes them to all the other translators working on the project. The translator no longer needs to reload the page manually, as he sees the colleagues' changes automatically. To simplify communication within a project team, the project administrator can send important information as a message to all translators assigned to the project.

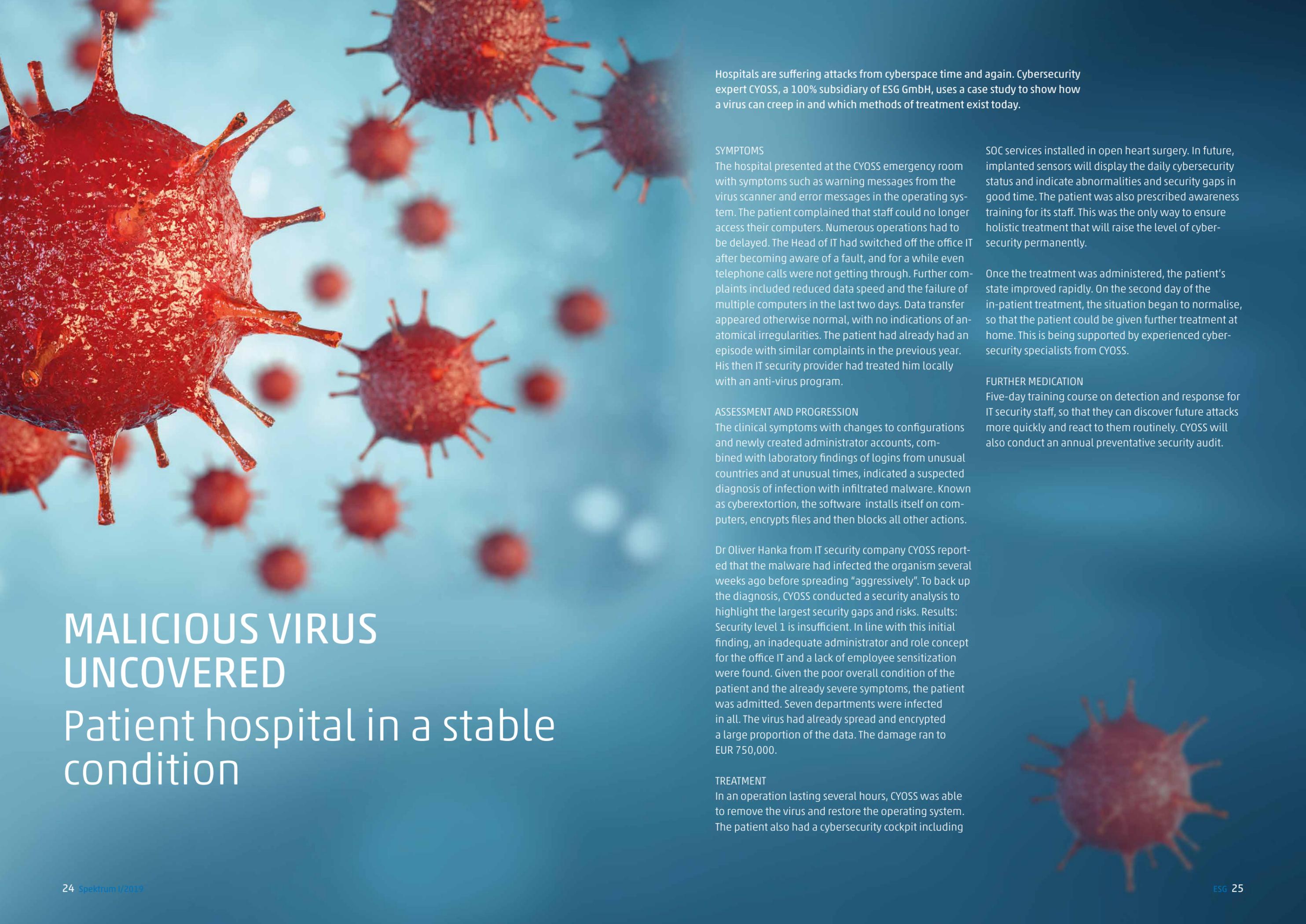
A bidirectional algorithm is used to translate display texts into Arabic, in order to put the characters in the right order. The translator sees two views: the translation view and the presentation on the display.

The engineers at ServiceXpert developed the new Miele language tool with its integration into Miele's existing IT infrastructure in mind. As well as redesigning and refactoring the functions of the existing language tools, Miele also required the development of extensive new functions, such as display of the translation in a tree structure and a cost billing tool.

### THE FOLLOWING SERVICE PACKAGES WERE PROCESSED IN THE PROJECT:

- » Creation of the specialist concept for developing the language tool
- » Development of the language tool as an online application system
- » Development of the import and export interfaces
- » Integration of the language tool into Miele's existing IT infrastructure
- » Support for the introduction of the language tool to Miele's IT operations

The Miele language tool is developed on the basis of the Microsoft®.NET Framework with C# on the server side and Angular on the client side. Developing this tool implements future-proof programming techniques, the corporate design of the application and enhanced user friendliness.



# MALICIOUS VIRUS UNCOVERED

## Patient hospital in a stable condition

Hospitals are suffering attacks from cyberspace time and again. Cybersecurity expert CYOSS, a 100% subsidiary of ESG GmbH, uses a case study to show how a virus can creep in and which methods of treatment exist today.

### SYMPTOMS

The hospital presented at the CYOSS emergency room with symptoms such as warning messages from the virus scanner and error messages in the operating system. The patient complained that staff could no longer access their computers. Numerous operations had to be delayed. The Head of IT had switched off the office IT after becoming aware of a fault, and for a while even telephone calls were not getting through. Further complaints included reduced data speed and the failure of multiple computers in the last two days. Data transfer appeared otherwise normal, with no indications of anatomical irregularities. The patient had already had an episode with similar complaints in the previous year. His then IT security provider had treated him locally with an anti-virus program.

### ASSESSMENT AND PROGRESSION

The clinical symptoms with changes to configurations and newly created administrator accounts, combined with laboratory findings of logins from unusual countries and at unusual times, indicated a suspected diagnosis of infection with infiltrated malware. Known as cyberextortion, the software installs itself on computers, encrypts files and then blocks all other actions.

Dr Oliver Hanka from IT security company CYOSS reported that the malware had infected the organism several weeks ago before spreading "aggressively". To back up the diagnosis, CYOSS conducted a security analysis to highlight the largest security gaps and risks. Results: Security level 1 is insufficient. In line with this initial finding, an inadequate administrator and role concept for the office IT and a lack of employee sensitization were found. Given the poor overall condition of the patient and the already severe symptoms, the patient was admitted. Seven departments were infected in all. The virus had already spread and encrypted a large proportion of the data. The damage ran to EUR 750,000.

### TREATMENT

In an operation lasting several hours, CYOSS was able to remove the virus and restore the operating system. The patient also had a cybersecurity cockpit including

SOC services installed in open heart surgery. In future, implanted sensors will display the daily cybersecurity status and indicate abnormalities and security gaps in good time. The patient was also prescribed awareness training for its staff. This was the only way to ensure holistic treatment that will raise the level of cybersecurity permanently.

Once the treatment was administered, the patient's state improved rapidly. On the second day of the in-patient treatment, the situation began to normalise, so that the patient could be given further treatment at home. This is being supported by experienced cybersecurity specialists from CYOSS.

### FURTHER MEDICATION

Five-day training course on detection and response for IT security staff, so that they can discover future attacks more quickly and react to them routinely. CYOSS will also conduct an annual preventative security audit.



# SECURITY OF IT AND OT

## Humans as the critical factor in the success of the digital transformation

**Industry 4.0 is a highly-sensitive target that cannot be protected through technological means alone. Humans also play a crucial role in the security concept of the future.**

More than half of all companies in Germany have been the victim of a cyberattack in recent years. The systems affected by cyberattacks are no longer limited to information technology. While failures and attacks on conventional IT infrastructures have an effect on operational continuity and often financial consequences, a failure of industrial control systems can endanger the

availability of the services to be provided. Attacks on operative technology (OT) and industrial control systems (ICS) can have a direct impact on the real world, sometimes with devastating consequences. CYOSS, a 100% subsidiary of ESG GmbH, has simulated how an attack like this might look.

Operative technology and industrial control systems are found in many fields: controls in vehicles, machines and medical devices; systems in critical infrastructures; and everyday fields of building automation, such as lifts and smoke extraction systems. These control sys-

tems are especially vulnerable to attacks from cyberspace. After all, typical industrial control systems have a long service life, sometimes more than twenty years. That means the systems installed today were developed as far back as the 1980s and 1990s. Designs back then did not take into account the level of connection seen today (Industry 4.0), nor cybersecurity concerns in general. It is also common for them to be operated without regular software patching, making it impossible to protect end users through software. The use of IT components in OT also opens the door to attackers if they are not protected and hardened properly.

Protective mechanisms for OT and IT are at least as important today and physical protective measures for a factory. Terrorists and other criminal groups are now able to gain access to a plant's control system, in order to endanger the plant itself, the environment and people or to gain a ransom from the operator through extortion. Attackers can penetrate and manipulate the systems through network connections. Malware can paralyse large areas, causing immense physical damage and hazards to life and limb. Numerous production shutdowns at international corporations came to light in 2017, but the fact that factories and plants are targets of cyberattacks was known long before this.

Production environments therefore need sophisticated security concepts in order to ensure OT and IT security in practice – for both new systems and existing plants. However, there will never be 100% protection for IT and OT. Instead, the key in the future will be to detect attacks in good time and to take effective steps to limit the damage to a minimum. Given this situation, CYOSS GmbH has developed a training module designed for industrial control systems at Germany's first Cyber Simulation & Training Center. Trainees can use the module to familiarise themselves with the problems and weak points of connected systems/plants and expand their expertise, so that they can detect attacks quickly and defend against them successfully. To do this, IT components from a SCADA system, such as monitoring and maintenance systems, are operated in the virtual training environment and connected with hardware to control production plants (programmable logic controllers, PLCs). Acting as symbols for a real factory system,

actuators can be connected to the control systems in order to make the consequences of the attacks on the training environment on site in the Cyber Simulation & Training Center tangible.

### WEAK POINTS IN THE PLC

Together with its partner RadarServices, CYOSS GmbH is a provider of "cybersecurity made in Europe", focusing on IT and OT security. In a showcase, CYOSS demonstrated the vulnerabilities and sensitivities of industrial control systems (ICS) using a specific example: manipulation of the control of a robot arm through weak points in the PLC. This was done using a control device for processing piece goods using a robot arm. Hardware and software components that are widespread on the market were used to program and monitor these SPS control units. The robot arm is operated and monitored via an engineering work station. Once the attacker, who is already inside the company network, has found this computer, he tries to gain access. These client

computers are often not equipped with the latest software. The attacker exploits this in a targeted way, looking for weak points and using exploits (malware) for his criminal purposes.

Once he has gained access to the engineering work station, he can achieve his aim of sabotaging the production process and causing massive disruption

to operations. One way to do this is through targeted manipulation of the robots' control programs. These manipulated program components then also enter the PLC with the next regular maintenance.

What can be done to combat this kind of incident, which can cause serious damage? A first step towards protecting industrial control systems is to raise awareness among employees of companies and state organisations and to provide targeted training for technical staff. As well as implementing technical measures, companies need to receive advice on how to support people in their roles. Ideas for solutions that can help to protect industrial control systems are either derived from conventional IT or grow out of commercial innovation processes. But any technology is worth nothing if the staff do not know how to use it adequately, do not work correctly, or are taken in by attackers out of sheer ignorance. All security meas-

**CYBER-  
SECURITY  
made in  
Europe**



1 Education, training and sensitisation are key elements for minimising risk.

ures should therefore concentrate even more on the person as a particularly important vector for cyber-threats.

#### NETWORK MONITORING

Humans really can be the crucial weak point in any organisation or security chain. Education, training and sensitization are the key elements that can be adjusted in order to reduce the risk factor considerably. CYOSS has therefore developed holistic solutions for the entire IT security chain, comprising prevention, detection and reaction. Anyone who wants to effectively counter hazards from cyberspace today needs a plan for how to detect attacks and react to them appropriately. This is where a Security Operation Center (SOC) comes in: it constantly monitors an organisation's systems, data and network in order to detect threats early and counteract them in a targeted way. With specialist staff rare, companies are increasingly turning to the services of external SOC specialists. However, these specialists also need internal contacts who are familiar with both their own systems and questions of information security.

Many companies recognise the vital importance of information security, yet find it difficult to attract staff with the relevant qualifications. After all, as well as standard skills, such staff need substantial experience in detecting and dealing with cyberattacks. The solution is for companies to get their own specialists up to speed with the challenges of cybersecurity with training measures, so that they can recognise security-critical incidents early and use tried-and-tested processes to react quickly, reliably and appropriately. It is worth investing intensively and purposefully in advanced training for in-house staff, in order to combine and keep the greatest possible expertise within the company. Combining security technology and targeted investment in substantiated training is the only way to create a package that meets the highest standards and offers protection against attacks from cyberspace.

Protect yourself:  
[www.cyoss.com](http://www.cyoss.com)



## RISK MANAGEMENT

### The strategic control instrument

**In an increasingly complex world, risks are rarely a question of yes or no. ESG Consulting GmbH, a 100% subsidiary of ESG GmbH, explains which assessment method provides contemporary support for companies in their decision-making.**

The aim of risk management is to use a systematic approach to remove decisions as far as possible from the range of uncertainty and thus out of the risk, in order to get as close as possible to effective, proper and economical fulfilment of tasks. Avoiding a mere semblance of accuracy is one of the central concerns of risk management. An oversimplified way of describing risks based only on "probability of occurrence" and "level of damage" is still widespread, but fails to account for the random character of risks. A more effective way to quantify possible deviations from the plan is by stating spectra – the minimum, most probable and

maximum values. ESG Consulting uses a model tailored individually to the customer situation, with the help of the Monte Carlo simulation (MCS). The most important random simulation process in risk aggregation, the MCS can provide transparency on a risk-orientated calculation of the level of planning reliability (and uncertainty). In this process, a large number of future scenarios that are possible based on risk, is calculated and analysed. This provides transparency about the scope of risks, which can be taken into account in decision-making (e.g. in value-orientated management for calculating the operating income, in projects with delayed delivery dates).



1 Successful projects thanks to active risk management with ESG Consulting

A scenario is the combination of all available information regarding a future development for an object of prediction. Three scenarios are often considered in the form of a Spektrum:

- » Best case: the most favourable realistic development chance is depicted.
- » Worst case: the most pessimistic realistic scenario is depicted.
- » Basic scenario: the most probable scenario (trend scenario) is depicted.

#### EXAMPLE: PLANNING UNCERTAINTY IN PROJECTS

Project uncertainty that affects deadlines, costs and quality includes planning errors, inaccurate specification, staff fluctuation, poor supplier quality, delays in delivery, and varying team performances. All these risks are different causes for the effect "deadline delay". An effect aggregation is therefore conducted. Spectra can be defined for each risk, allowing probabilities of delivery delays to be calculated for each risk aggregation using the MCS.

The result of the simulation: with optimistic project planning, the completion date would be 1st October 2018. The spectra of uncertainty in the course of the

project show that the probability of the project being completed by 26th February 2019 is 80%. The most probable completion date would be 1st January 2019.

This simulation was conducted in a real project independently and before the project was replanned. Later replanning pushed the completion date back from 30th August 2018 to 4th March 2019. This proved that a prediction of the completion date can be significantly improved with an MCS and the associated analysis of project uncertainties at the start of the project.

Risk assessments like this should always be conducted during the preparation phase of a project so that project tolerances can be provided, in line with the PRINCE2 principle of "management by exception".

#### EXAMPLE: CORPORATE PLANNING

The same principle can be applied to corporate planning. For example, the risks of price fluctuation, new competitors, customer volatility and loss of key accounts influence the target parameter of turnover. Other target parameters, such as the cost of material, staff and interest payments, can be defined as separate risks with their own spectra, in order to create a risk-adjusted operating income (or profit contribution, EBT etc.).

The risk adjusted capital (RAC) and other performance figures (RORAC = return on risk-adjusted capital) can thus be determined. RAC means the level of equity required in one year to cover the risk, in relation to a certain security level (e.g. 95%). This corresponds to the risk level "value at risk". The fundamental consideration here is that the role of a company's equity is to cover losses.

The methods described in this article are an approach developed by ESG Consulting, with adaptation of the Monte Carlo situation.

#### SUMMARY

The uncertainty regarding future developments in the company or project environment demands that companies consider a range of conceivable future scenarios. It is important not to focus on just one scenario. Instead, it is a good idea to consider potential alternative scenarios and to take into account the consequences of these scenarios for the success parameters of the company or project. The Monte Carlo simulation is an instrument that enables a large, representative number of future scenarios to be constructed and analysed based on prescribed rules (e.g. the company's own planning) and taking risks into account.

ESG Consulting advises and supports its customers in establishing and introducing a risk management system or internal control system, in project risk management, in IT risk management, in risk management in connection with information security, and in all other issues of governance, risk and compliance (GRC).

Find out more at [www.esg-consulting.com](http://www.esg-consulting.com)

