# SOLUTIONS ERA

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## For those who follow the trends in intelligent engineering solutions

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### **News**feed

In October, the investment bank, GILD Corporate Finance, announced a list of 100 of the most valuable companies in Lithuania, and Fima, the only engineering solutions company ranked in the list, was 95<sup>th</sup>. The GILD100 ranks companies by their share value on the first day of the calendar year.

MODERNIZATION

- Fima has started a project to install a video surveillance system in a motor vehicle production plant MAZ in Minsk. Fima will install an IPbased CCTV system and a video surveillance centre. The MAZ plant is one of the largest in Belarus and employs more than 25,000 people.
- The Fima subsidiary in Poland, Fima Polska, has finished installing a highly reliable data centre in the Cardiology Institute in Warsaw. The facility's modular construction means that it will be straightforward to expand it further in response to the growing demands for information technology at the institute.
- Fina and Lithuanian Railways signed a contract for the development and implementation of a ticket booking and sales system. Once the new system is put in place, travelers will be able to book seats on local routes and buy train tickets online. The new booking system is expected to be launched at the end of 2014.

# Fima to electrify rail line to Belarus

In November, a consortium made up of Fima, Eurovia Lietuva and Eurovia CS with the Lithuanian railway company, Lietuvos geležinkeliai, **signed a contract to electrify the section of railway between Naujoji Vilnia and Kena.** 

The electrification of the line is the first project of its kind in Lithuania since the restoration of independence in 1990. Eurovia will be responsible for the construction work while Fima will install a contact network and build a 110/27,5 kV substation.

"This project is of strategic importance to Lithuania. After its implementation, the last gap in the chain of electrification of the international line between Vilnius and Minsk will be completed. The electrification of the rail connection with Belarus will ensure not only a better connection for travelers between Vilnius and Minsk, but will also provide Lithuania with major advantages in the competition for transit load flows," said Fima General Manager Gintaras Juknevičius.

Once electric trains start running, the journey time between the two capitals is expected to fall to two hours.

The electrification is expected to be completed by 2015.



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# Highest reliability fire detection and extinguishing systems installed **in the combined cycle block of the Lithuanian power plant**

A new combined cycle block, which should satisfy up to 25 per cent of Lithuania's electricity needs, started operating in the Lithuanian power plant last year and Fima engineers were heavily involved in the construction of this unique and complex facility. **Responsible for overall fire safety in the new block, Fima specialists designed and installed all of the fire detection and extinguishing systems: fire alarms, gas leakage detection and extinguishing systems.** 

Several types of extinguishing systems were installed in the block to cover different potential sources of fire. In areas where there is the possibility of a gas build-up, automatic gas detection and CO2 gas fire extinguishing systems were installed along with a foam-based fire suppression system in areas with oil filtering systems. Fires in transformers, a diesel generator, a turbine bearing system and cable premises would be extinguished by water whereas fires in cabling would be dealt with by FM200 gas. Rapid action should a fire break out was ensured by detectors which are able to detect the source of a fire very early on.

The block was built by the Spanish energy company, Iberdrola Ingenieria y Construccion, S.A.U. Fima was chosen to install fire safety systems because of its long experience in installing security solutions having implemented them in the Ignalina nuclear power plant, oil facilities, airports and data centres.

"The company insisted upon very high standards from its subcontractors in terms of technologies used and specialists employed making working with this international energy firm an excellent, interesting and valuable experience. Despite having to comply with more paperwork than when we work with Lithuanian contractors, we experienced a different attitude towards work. The quality of materials and safety were the highest priorities. The reliability of all systems operations was carefully checked. some of them were checked several times even though local standards do not require this," said Fima project manager Vytautas Lukšys, who supervised the installation.

### Iberdrola Mechanical Engineering Manager Víctor Cervantes:



We selected Fima because of the company's competence and experience in designing and installing fire extinguishing systems. Fima is known as a company that is able to adjust to frequent changes, which are inevitable in projects of such a scale, and

react to unpredicted situations. In my opinion, in some of these situations the solutions offered by Fima specialists were particularly important, as they allowed us **to complete the project on time and to implement all Lietuvos energija's quality requirements.** 



# Dainius Puidokas, AB Lietuvos energija's lead engineer on the combined cycle block, said:

"Technologies which help to manage critical situations in such industrial facilities are among our highest priorities. The main purpose of fire prevention and extinguishing systems is to alert staff when fire breaks out in good time and isolate or neutralise the blaze so that people can be evacuated safely and human lives can be protected."

# **Challenge facing data network infrastructure** - growing need for bandwidth

As the volume of digital data increases rapidly, the main challenge that network infrastructure providers face is the ability to ensure fast, safe and uninterrupted data transmission. **Eugenijus Kurtinaitis, the Director of Fima's Telecom-munications solutions department**, discusses trends in infrastructure and the latest solutions on the market.



Eugenijus Kurtinaitis, Director of Telecommunications Solutions Department at Fima: Careful selection of our partners allows us to truly understand their products and only offer our customers the solutions which we have detailed knowledge of.

#### What are the key challenges that data transmission network providers have to deal with?

The majority of our customers already have network infrastructure and therefore turn to us most frequently when their existing bandwidth is not sufficient for their needs. The world is developing rapidly – companies used to be satisfied with half, one, two or three megabyte connections but now these are nowhere near sufficient. Customer demand for wider bandwidth increases constantly and finding the solution to this closed circle is our biggest challenge.

More and more company transactions take place in virtual environments and network reliability becomes ever more important, so ensuring an uninterrupted power supply has become an integral part of the information technology sector's focus.

Meanwhile, the security of data transmission is, of course, just as important.

#### If a company is planning to renew its network infrastructure, what are the points it needs to consider?

Wider bandwidth requires more powerful and faster operating equipment. When selecting the right equipment a company has to consider its future bandwidth requirements because designing it to handle the needs of today is not enough. Based on my experience, a company is likely to reach the limit of its network and data transmission resources – something that it plans to renew perhaps every three years – within a single year.

It is vital that network equipment is selected carefully. The cheaper equipment that you can find on the market will most likely have to be replaced within a year while more expensive equipment produced by reputable manufacturers is likely to last two or even three years. Such an investment will pay for itself because it won't require constant maintenance something of a sensitive issue for most Lithuanian companies. Lithuania already lacks a sufficient number of qualified IT specialists and global companies are actively recruiting them so there will be an even more pronounced shortage of them in the future.

#### What network infrastructure solutions do you offer?

Fima is an authorised representative of several world-renowned network infrastructure equipment manufacturers. The technologies they offer upgrade existing company and network service provider systems in ways that ensure that growing demand for bandwidth is satisfied.

Switching equipment produced by Fima's American partners, Extreme Networks and Brocade, can cope with bandwidths of 100 megabytes per second, 500 megabytes per second or even 1 gigabyte per second and are renowned for their very high operational reliability.

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Eaton, the world's leading manufacturer of uninterrupted power supply (UPS) equipment, which is also a Fima partner, has begun to offer UPS solutions for virtual servers. Server virtualization, which really started to take off two or three years ago, was a challenge because the UPS solutions available at the time were not suitable.

We cooperate with only few manufacturers because our strategy is to offer our customers complex solutions adapted to their individual needs rather than single products. We only select a solution after we have analysed the customer's situation and found the pinch point – the bottle neck on the network where the problem lies. Careful selection of our partners allows us to truly understand their products and only offer our customers the solutions which we have detailed knowledge of. This strategy creates added value because our customers know that they can rely upon Fima to implement a project properly and that their networks will operate correctly. Solution providers who partner with large numbers of manufacturers never know the products in detail and can only ever scratch the surface of the customer's problems.

#### In your opinion, how will network infrastructure develop further?

Unquestionably, the demand for bandwidth is going to keep

on growing and this is being driven by current trends. More companies are deciding to purchase data centre services and transfer their data into the cloud. People are also demanding ever-wider bandwidth with more and more services now available online and the amount of video streamed on demand continuing to increase. Indeed, television services are increasingly becoming available on the internet and so it is natural that users are demanding higher definition video online. So, one of the biggest issues that faces network infrastructure builders is to find solutions that guarantee wider bandwidth to satisfy the demands of companies and individuals.

# **New UPS for virtual** servers Eaton 9PX/9SX

- > Compatible with virtual servers
- Switches into operating mode in 2 ms
- **Higher energy efficiency** 98% (other solutions in the market 94%)
- Safer server environment (almost zero heat emissions)
- **Energy-saving**, lower energy costs
- **More reliable technology**, a much lower likelihood of breakdown
- In case of breakdown, it is relatively straightforward to ensure an uninterrupted power supply without disassembling the equipment
- **Compact** (space for one more server)

#### GOOD TO KNOW

### Brocade equipment can be leased

Fima has expanded its portfolio of data communication solutions by cooperating with the global network infrastructure producer, Brocade. The company, which operates in more than 160 countries worldwide, is a leader in providing reliable, high-performance network solutions. Brocade offers a wide range of high quality network infrastructure solutions, which meet the needs of small companies, large corporations as well as data centres.

Brocade can offer the leasing of equipment. This will help companies to save on large initial investments and allow them to react flexibly to changing needs as well as to increase and reduce network capacity as appropriate. By leasing equipment, companies will not need to worry about maintenance because this will be taken care of by Brocade.

# **Dr R. Sullivan:** More companies are moving to Housing and Hosting sites

With the quantity of digital information growing rapidly and data centre capacity increasing to meet it, data centre designers have to meet ambitious objectives: to improve the infrastructure of data centres so that they can function reliably and efficiently using as little power as possible.

"Solutions Era" interviewed **a data centre infrastructure professional, Dr Robert Sullivan**, on the prospects for development in the sector. A former longterm IBM employee Dr Sullivan is one of the most influential data centre design specialists, whose solutions for energy efficiency and cooling infrastructure are applied in data centres around the world.

#### What are the most important trends in the design and building of data centres today?

One major trend is the movement to housing and hosting sites, rather than companies building their own data centers. Many companies, large and small, are reevaluating their use of capital. They are looking at the core values, products, services, etc. and seeing that data processing is not one of them. Efficiency and cost reduction are key factors in data centers today, both existing and new build. The most efficient computer equipment, UPS systems, and of course economizer cooling systems are used for this purpose. The other major trend is the move to virtualization, increasing the usage of servers and storage devices from the

<10% utilization we see today to at least 20% and even up to 80% utilization in new installations.

#### Do you agree that a company should decide on the level of availability (TIER) it needs for its data centre based on the cost it will pay for downtime?

The above statement is an imperative that few companies have followed. Most companies demand 24XForever availability with no real justification. What every company should do is have a case study completed that financially justifies the 24XForever availability requirement. If the cost scheduling regular maintenance windows is too much of a economic burden then the power and cooling infrastructure should be upgraded

so that concurrent maintenance can be conducted on all systems without having to shut the computer systems down. But it should be a financial and not emotional.

Efficiency and cost reduction are key factors in data centres today, both existing and newbuild.

There is much talk about the data centres run by very large companies – for instance Microsoft, Google, Facebook and eBay. What are the differences between those data centres and the ones other companies or state institutions build?

The companies you mention have single purpose data cen-



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ters, in that all the servers in the critics. facility do one or a few things. Each facility has 10,000s of servers all working together. If a few 100 fail due to abnormal environmental conditions the server vendor is got going to complain.

These facilities also minimize the redundancy is any one facility, instead relying on an N+1 DC redundancy model, where if one center fails the work load is parceled out to other DC facilities worldwide.

These are not enterprise data centers and do not have to conduct the wide variety of services that the enterprise facilities are required to provide, yet they preach their efficiency numbers as something that everyone should be able to attain.

#### How green are data centres in reality?

With the exception of a few corporations who have a true "green" philosophy the majority of data centers have the objective to reduce cost by being more efficient.

Many of the "green technologies" are not suited for supplying power or cooling to a DC. Solar cells might be able to provide a "net zero" power flow to operate the lights in the facility. Unless there is a grid connection between the area where the wind blows and the area where the power is needed the technology can not offer green power to its

Does the climate in the Baltic countries have advantages for building data centres here?

> Decisions on the uninterruptible operation of data centres must be financial and not emotional.

The climate in the Baltic has an advantage of providing a marine type of environment over much of its area. This provides moderate temperature and dew point variations from which economizer cooling systems can obtain a maximum number of "free cooing" hours annually.

#### What will data centres look like in the future?

I see processors that are molecular in size and use a minute amount of energy with similar breakthroughs for storage of data. Yet with all this miniaturization there will still be great demand for power.

They keyboard will be like the slide rule is today. It will no longer be needed to operate, input data, etc. In its place will be voice activation of many functions.



Modern data centres are equipped with the most efficient computer equipment, UPS systems, and economiser cooling systems.

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# Modern solutions for prison security

The modernisation of Lithuania's prisons is finally underway. All of the country's penal institutions will eventually be modernized but the first step will be the transfer of Lukiškės prison in Vilnius to Pravieniškės. The Prison Department is currently looking for a private investor to build a prison to hold 320 inmates within three years. **The prison in Pravieniškės will become Lithuania's first modern penal institution with the latest in electronic engineering solutions ensuring both internal and external security.** 

Fima, which has extensive experience in implementing security solutions, is participating in the tendering process and, in preparation, the company's specialists have thoroughly reviewed other countries' experiences of prison modernisation as well as consulting with Fima's overseas partners.

"No Lithuanian company has a great deal of experience in this area and Fima has not yet implemented security solutions in a prison. However, the experience we have gained from implementing security solutions in high-risk installations such as the Ignalina nuclear plant, oil terminals and airports, as well as learning from the experiences our foreign partners have in prison security, have meant that we have been able to prepare a security system based on modern technology that ensures the highest levels of protection for staff, is flexible enough to adapt to changing needs and requires little maintenance," said Vytautas Zinkevičius, Fima's Business Development Director.

## Solutions to ensure the security of employees

New technology could help Lithuania's prisons solve their

New technologies complement traditional physical and mechanical means of providing security still used in prisons. They allow risks to be managed more effectively as well as minimising direct contact between inmates and employees.



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Vytautas Zinkevičius, Fima's Business Development Director: A prison is one of the most complex engineering installations and differs from other buildings with high security requirements because the main source of risk comes from the prisoner.

most pressing problems: the security of employees and preventing prohibited items being brought in, according to Mr Zinkevičius.

Ensuring security in penal institutions is particularly complicated with any activity having to conform to a strict procedure and the access of people and objects closely regulated. Staff who spend the best part of their working day with prisoners are under constant psychological pressure and the threat of attack.

Mr Zinkevičius said that one of the most effective ways to re-

duce these threats is to limit the need for direct contact between prisoners and prison guards. "With the help of electronic technology, many tasks can be carried out remotely without direct human contact. For example, if an internal messaging system is installed, there is no need for a guard to go to a cell every time a prisoner needs something. Using internal communications, the prisoner can contact the officer from his cell and the officer can provide instructions," added Mr Zinkevičius.

In a modern prison, staff who are in direct contact with inmates are equipped with personal protection devices that, in a critical situation, allow them to contact central security immediately and call for reinforcements.

## Detection of prohibited items

Meanwhile, modern technology also ensures more effective control of prohibited items. The inspection of persons entering and leaving prisons is a daily routine and so modern penal institutions use a particularly advanced technology – equipment that "sniffs" a person by analysing the composition of air and, depending on the microparticles detected, is able to identify attempts to smuggle in narcotics or explosive substances.

#### Estonia as an example

According to Mr Zinkevičius,

# Reform of penal institutions in Lithuania

In 2009 the Lithuanian Government adopted The Prison Modernisation Strategy prepared by the Ministry of Justice. The first step in the reform, which will involve all 11 of the country's prisons, will be the transfer of the Lukiškės prison complex from Vilnius city centre to Pravieniškės. The implementation of the reform will solve the long-standing problem of prison overcrowding and ensure greater security in prisons across the country.

Lithuania can learn from the experiences of Estonia, which is also reforming its prison system. The country has two Europeanlevel cell-type prisons where most security problems are solved by modern technology. In Viru prison, which was built several years ago, Fima's partners were involved in the installation of electronic security measures.

The safety of staff and security of the prison are ensured by high-resolution video cameras which are controlled remotely. The camera network has been installed in a way that covers all areas within the prison as well covering its external perimeter. The most modern Estonian prison also has an automated video analysis system that not only broadcasts real-time video to security posts, but also analyses it according to specified criteria.

"The system is capable of analysing an image according to a variety of parameters. It can detect movement, for example somebody attempting to climb over a wall, movement on the other side of the wall and can even distinguish between colours," said Mr Zinkevičius.

# Complex solutions are the most effective

Mr Zinkevičius pointed out that finding solutions to security issues in modern prisons requires complex solutions. He said: "New technologies complement traditional physical and mechanical means of providing security that are still used in prisons. They allow risks to be managed more effectively as well as minimising direct contact between inmates and employees. Modern technology provides an additional instrument in ensuring security, however the competence and motivation of staff remain important components in ensuring prison security and order."

# Smart cities – a 21st century phenomenon

Cities are developing rapidly all over the world. It is estimated that half of the world's population lives in cities and, according to data provided by the United Nations, this number will reach 60 per cent in 2030. The growing number of city dwellers raises new challenges for municipalities: **how to ensure the needs of a growing city with only limited resources, providing quality services to inhabitants while reducing environmental pollution at the same time?** 



#### The solution – going smart

With rapid urbanisation, the usual means of saving energy and increasing efficiency are not effective, therefore cities must look for innovative solutions, adopting new information and communication tools and implementing green technologies that allow a more sustainable use of energy while adopting more renewable energy. Lithuanian cities must also go down this road.

# Focus on the transport sector

The implementation of smart solutions in cities is actively supported by the European Commission which helped to implement the Smart Cities and Communities Initiative, which focuses on the issues of energy use and urban transport.

Smart cities – the cites, which implement the latest information and communication technologies, providing higher quality, more resource-efficient and more environmentally friendly services to their inhabitants.

> Currently, the transport sector generates about one fifth of all CO2 emissions in the EU. The European Commission is seeking to reduce emissions by 20 per cent by 2020. However, transport volumes in Europe are still growing – by 2020, freight transport volume will have increased by 50 per cent and passen-

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ger transport volume by 35 per cent.

Besides the issue of pollution reduction, EU countries are actively tackling the problem of road congestion. It is estimated that congestion from traffic jams costs EU countries more than 100 billion euros every year.<sup>1</sup>

#### Solutions to complex problems

According to Fima Project Manager Simonas Šidlauskas, Lithuanian cities should follow the examples set by countries in western Europe when it comes to using new technology to solve issues around urban transport development.

The advantage of transport solutions based on the latest technologies is that one tool often solves more than one problem. "All road transport problems are interrelated. Larger transport volumes mean more congestion and higher CO2 emissions, higher accident and road mortality rates and more rapid road deterioration. Intelligent transport systems mean that these problems can be tackled together rather than separately.

## More efficient public transport

One of the priorities in developing smart urban transport systems, according to Mr Šidlauskas, should be efficient public transport. "In order to reduce road congestion and improve transport flows, cities should encourage the use of public transport. Such solutions as electronic ticketing, for example, make public transport more convenient. So far in Lithuania, electronic ticketing on public transport has only been implemented in individual cities but in the future these will have to be connected into a single countrywide system. This would allow different modes of transport across different cities. The single ticket concept is one of the EU's key transport policies," added Mr Šidlauskas.

#### Fewer number of speeders and lower number of traffic offences

The most effective way of controlling speeding through the use of intelligent transport systems is, according to Mr Šidlauskas, by the accurate measurement of average speeds. "Speed measuring devices are only effective on a limited section of road. Having passed the device, drivers invariably speed up again. One of the most effective tools to control people who insist on speeding on both city roads and highways is to measure the average speed of the vehicle over the entire route."

## Solutions that are also important for smaller cities

The specialists behind intelligent transport systems emphasise that these technologies can be successfully implemented in both large and small cities. Rolandas Juraitis, the general manager at the Smart Technologies Association, confirmed that the size of the conurbation is irrelevant when it comes to smart transport systems. He said: "On the contrary, in Europe it is thought that a city of fewer than half a million inhabitants has a better chance of implementing smart solutions than larger cities and can do so faster." The smaller the city, the easier it to reach an agreement and make a decision, he added.

Mr Šidlauskas agrees. "Transport management solutions are easily adapted to the needs and the size of each city. For instance, a smaller city does not need a traffic control centre the size of the one operating in Vilnius. The traffic here is less intense and there aren't any large traffic jams. One lap-

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top will be sufficient to access transport management equipment in the city at any time."

Traffic control systems should be particularly important for smaller cities intersected by highways. "For example, there is a highway crossing Radviliškis. It even has four major junctions. Here a small transport management centre could be installed which would regulate traffic flows and ensure that vehicles taking the highway cross the town safely in the shortest time," said Mr Šidlauskas.



A city of less than half a million inhabitants has better prospects of going smart and can do this faster than the big cities.



Simonas Šidlauskas, Fima Project Manager: One of the priorities in developing smart urban transport systems should be efficient public transport.

<sup>1</sup>Directive 2010/40/EU of the European Parliament and of the Council



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#### About "Fima" companies

Fima is the leader in intelligent engineering solutions in the Baltic countries, offering telecommunications, security, automation and data center solutions as well as individually tailored solutions for transport and energy sectors.

The company implements intelligent engineering solutions for businesses and governmental organisations in the Baltic states and Belarus and is continuously involved in projects of technological innovation. In two decades of operation, Fima has carried out several thousand projects of a various scale and degree of complexity.

Fima's headquarters are based in Vilnius, Lithuania. The company has subsidiaries in Latvia, Poland, Belarus.

Do you have ideas, suggestions or comments? Email us at solutions.era@fima.lt.

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