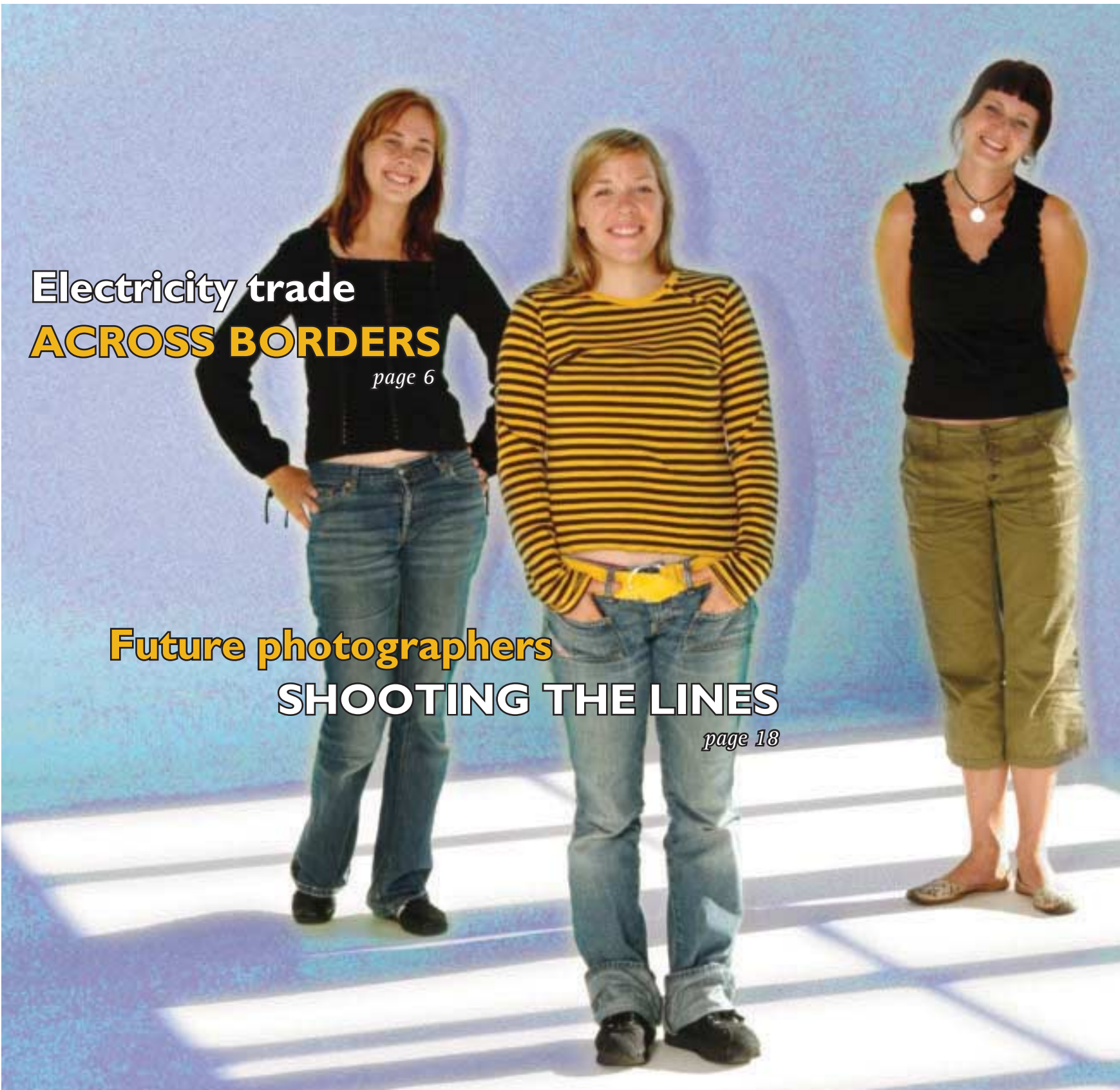
Corporate magazine
Fingrid Oyj
3/2004

FINGRID



Electricity trade
ACROSS BORDERS

page 6

Future photographers
SHOOTING THE LINES

page 18

Editorial

The Nordic countries will continue to be trailblazers on the electricity market

As is well known, the Nordic electricity market is the best-working multinational electricity market in Europe and maybe even in the entire world. It has been asked whether it is necessary to continuously try to improve the market mechanisms of such regional submarket which is already way ahead of other market areas. Besides, the European Union endeavours to create a single European market, not several submarkets.

The Nordic transmission system operators (TSOs) have pondered over the same question. Is it sensible for Nordel to make a lot of effort in promoting the electricity market in the Nordic countries if and when it is Brussels that ultimately sets the pace? The answer to the question is still 'yes'.

It will take a long time before the EU has a single electricity market. In the foreseeable future, this single market, at its best, will only be a regionally divided market. The Commission of the EU has now also faced the existing reality. The Commission hopes that there would be maybe 4 to 6 regional markets consisting of several countries, and these regions would evolve at their own pace towards the goals set by the EU. The Nordic countries distinctly constitute one of these regions.

The physical reality of the power system must also be taken into account. The transmission capacity between the Nordic countries and Germany – approx. 2,000 megawatts – is only a few per cent of the consumption load in the Nordic countries. This will not change essentially even if some new connections were built.

The role of a trailblazer has given the Nordic countries opportunities to influence the European developments. Brussels has not presented rules that would aim to change the Nordic market model. On the contrary, it appears that many principles and solutions applied here have been used as a model when the Commission has outlined the objectives for the EU market. It would therefore be of strategic advantage to retain this cutting edge.

Nordel's efforts to develop the electricity market have aimed at a situation where the rules would be as identical and simple as possible in all Nordic countries from the viewpoint of the market players. This does not mean, for instance, that the power system would be free from momentary physical congestions. Despite these, the market works well.

Nordel's challenge lies in that the easiest tricks have already been used. In many cases, further action will be more complicated or involve greater financial consequences. It may not be possible to find only win-win solutions. The Nordic market as a whole may win, but it may be difficult to justify the action taken in an individual country. It will be difficult for Nordel to make progress if the market players or authorities in different countries do not agree with each other. The establishment of a single Nordic TSO, which has been suggested, does not provide a cure for this particular problem; it cannot remove the said differences.

Juha Kekkonen (on the left) is the Chairman of Nordel's Market Committee. The photograph also shows some other members of the Committee: Cecilia Hellner (Svenska Kraftnät), Peter Jørgensen (Eltra), Bente Hagem (Statnett), Gudmundur Ingi Asmundsson (Landsvirkjun Transmisjon, with only back showing) and Klaus Thostrup (Elkraft System), leader of market development group.

It is therefore a positive thing that both authorities and market players have attempted to adapt their views about the way in which the market rules should be developed. In Akureir in Iceland, the Nordic energy ministers encouraged increased co-operation between the Nordic TSOs from Nordic standpoints.

What are the issues where results should be achieved? Increased transmission capacity is the biggest single topic, especially in financial terms. The investment programme concerning five transmission connections, published by Nordel in June, has been received positively.

Reducing transmission congestions through operative means is one of the foremost requirements presented by the electricity market parties. Nordel's suggestions to improve this situation, for instance through counter trading, are currently being commented on by the market players. The Nordic energy ministers were also concerned about achieving balance between production and consumption during peak load, and Nordel is expected to provide answers to this matter.

These and many other issues are topical within Nordel, not to forget the main duty of TSOs: to keep the lights on in the Nordic countries.

Juha Kekkonen is Fingrid's Executive Vice President.

FINGRID
Corporate magazine
Fingrid Oyj

7th volume
3/2004

Published by
Fingrid Oyj

Editorial staff
Telephone: +358 (0)30 395 5000, Fax +358 (0)30 395 5196,
Postal address: P.O.Box 530 , FI-00101 Helsinki, Finland
Street address: Arkadiankatu 23 B, Helsinki, www.fingrid.fi
Editor-in-Chief: Leni Lustre-Pere, leni.lustre-pere@fingrid.fi
Editorial board: Nina Elomaa, Jari Helander, Aila Itäpää, Antti Linna, Erkki Stam
Design by bbo, Better Business Office Oy, Maria Hallila and Tuija Sorsa
Translation by Kielipaja Hannu Hakala

Cover Photograph by Juhani Eskelinen
Printed by Sävypaino
ISSN 1455-7517

In this issue

4

The Nordic System Operation Agreement aims at efficiency and proper functioning.

6

Electricity trade across borders.

10

Fingrid's maintenance stands comparison.

Through the Nordic System Operation Agreement, which became valid in October 1999, Denmark, Finland, Norway and Sweden have jointly committed themselves to operating the interconnected Nordic power system so that it promotes the efficient utilisation of the existing resources and the functioning of the electricity market mechanisms.

TEXT BY EERO KOKKONEN

IMAGES BY KUVAPÖRSSI AND FUTUREIMAGEBANK

When the Nordic countries were liberalising their electricity markets in the 1990s, it soon turned out necessary to establish a grid organisation responsible for the respective power system in each country. This is why Denmark, Finland, Norway and Sweden each have TSOs (Transmission System Operator) appointed by authorities. The TSOs take care not only of the functioning of the power system within their own country but also for co-operation with the other TSOs.

Until the end of this year, there will be two TSOs in Denmark, one responsible for Jutland and the other for Sealand, but as of the beginning of next year these will make up a single Danish TSO.

As the electricity market was expanding into a single Nordic market, the TSOs stated that the operation of the interconnected Nordic power system and functioning of an open electricity market call for even closer co-operation and co-ordination between the TSOs. Denmark, Finland, Norway and Sweden constitute an interconnected Nordic power system. The system in Western Denmark (Jutland) has a different frequency (same as in Continental European) from the other Nordic countries.

Before the existence of a shared System Operation Agreement, there were bilateral agreements between the TSOs, based to a great extent on the recommendations of Nordel, the co-operation organisation of the Nordic TSOs. However, promoting the management of the Nordic system and fluent functioning of the market mechanisms involved so many issues which all Nordic TSOs shared that an inter-Nordic System Operation Agreement was considered a better option than bilateral agreements.

During its preparation, the Nordic System Operation Agreement evolved into an extensive document, since it aimed to consider all the essential procedures having bearing on security of supply. The rules and procedures were finally compiled into a Nordic System Operation Agreement in October 1999. The agreement is valid until further notice, but it is updated whenever necessary.

The purpose of the System Operation Agreement is to ensure that the parties involved maintain jointly a sufficient level of supply security and quality of electricity transmission in the Nordic power system. The TSOs must also take jointly care of the purposeful quality of electricity supply together with the related sectors of interconnected operation such as frequency, time deviation, stability etc. The parties have agreed to operate the interconnected Nordic power system in co-operation so that this promotes the efficient utilisation of the existing resources and the functioning of the electricity market mechanisms.

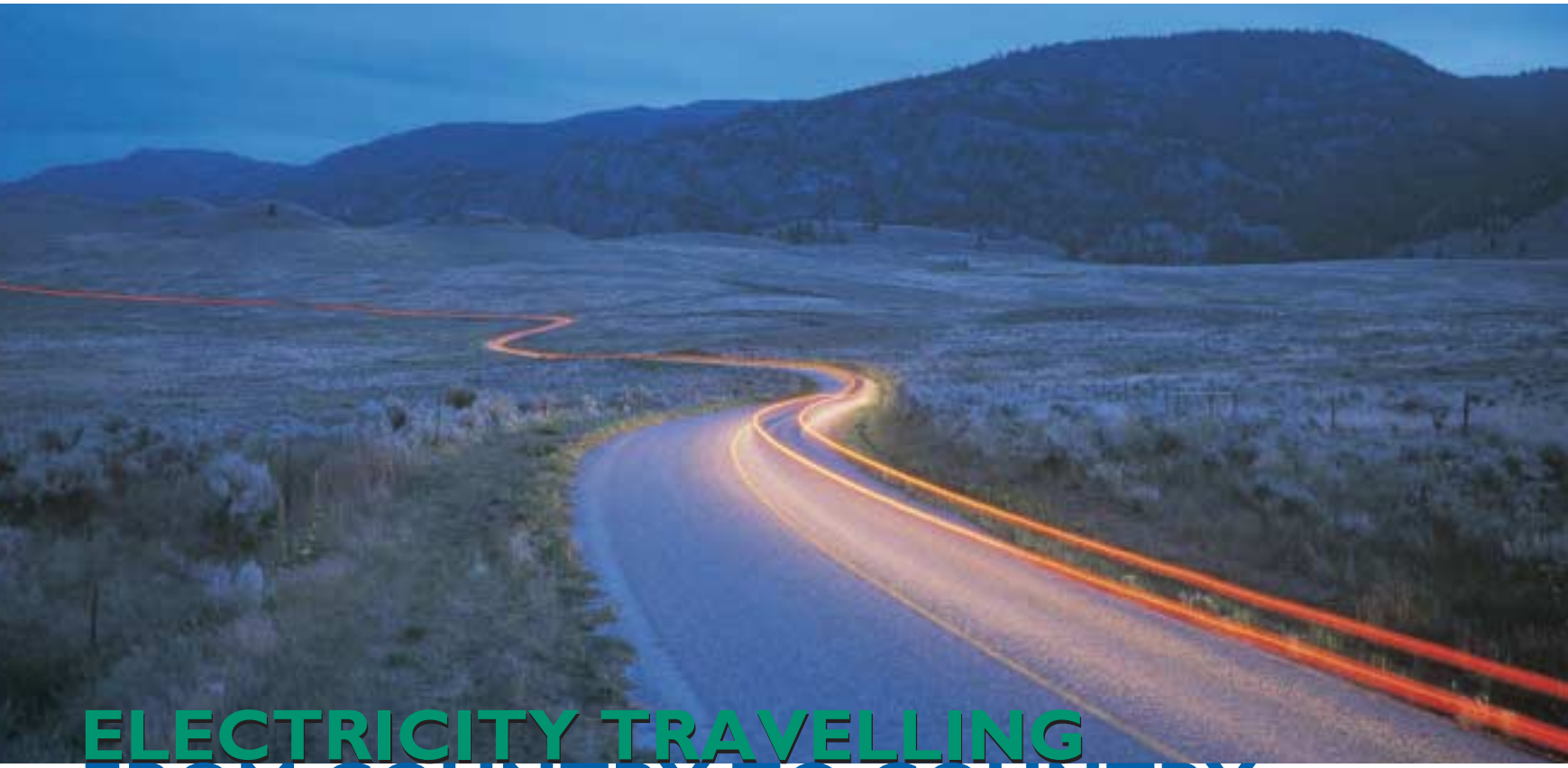
The System Operation Agreement imposes obligations relating to system and balance management on the TSOs, and the agreement also contains more detailed provisions that each party is committed to following in the joint operation of the power system. One of the main principles is that the power system must endure the loss of any power plant or transmission line. A dimensioning fault in the power system (n-1 principle) in one country must not disturb the neighbouring systems, either. For the electricity market, the foremost issues in the System Operation Agreement are provisions concerning balance management and electricity transmission management.

The current version of the Nordic System Operation Agreement can be viewed at Nordel's home pages at www.nordel.org.

NORDIC SYSTEM OPE

supports management of the interconnected power system and market mechanisms

RATION agreement



ELECTRICITY TRAVELLING FROM COUNTRY TO COUNTRY

Fluency as the goal in cross-border electricity trade

Electricity is transmitted more freely and also in greater quantities than before across national boundaries and through different countries within the European electricity market. In order to promote the functioning of the electricity market, there is a need for mechanisms which do not complicate cross-border electricity trade and which ensure the access of the market players into the transmission grid to deliver electricity from one country to another.

TEXT BY JYRKI UUSITALO PHOTOGRAPH BY KUVAPÖRSSI

For a few years now, the European TSOs (Transmission System Operators) have been applying a system based on a mutual agreement to the compensation of costs caused by transit, transmission of electricity through the TSOs grids. At the same time, the TSOs have gradually abandoned border tariffs which encumber cross-border electricity trade.

EU Commission finalising the guidelines

The EU's directive on the internal electricity market and the EU regulation superseding national legislation concerning access into an electricity grid in cross-border electricity trade entered into force at the beginning of July. The EU regulation also imposes rules on a compensation mechanism for electricity flows between TSOs across national borders.

The TSOs must obtain a compensation for costs caused by transmissions which take place in their grid and which cross national borders, and such compensation must be paid by those TSOs from whose grids these transmissions originate and to which they end up. The paid and received payments must be taken into account in national transmission tariffs.

The Commission of the EU will provide more detailed guidelines for the implementation of the compensation mechanism, and it will ultimately also accept the mechanism and the cost level applied. The guidelines are being drafted right now, and rather finished proposals can be expected in September in conjunction with the Florence Forum arranged by the Commission and electricity market regulators. The goal is to start applying the guidelines provided by the Commission in 2005.

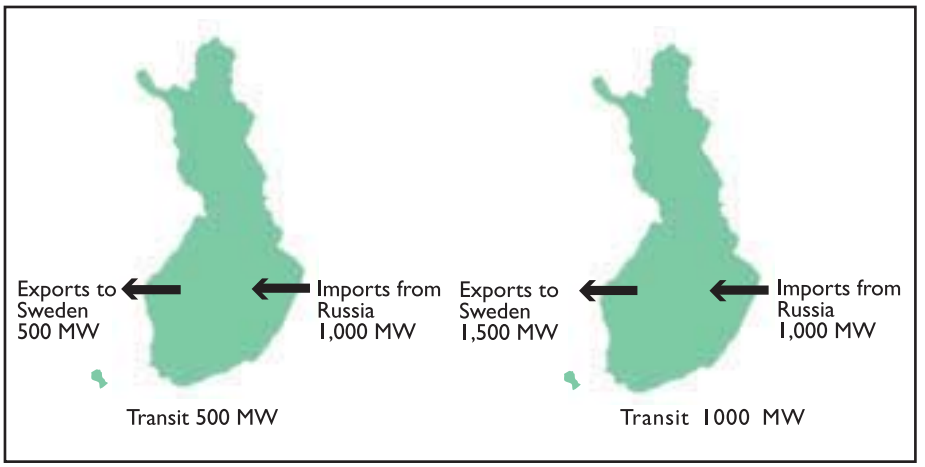
Nordel and ETSO developing the systems

Nordel has had a compensation system of its own for losses caused by transit since 2002. Similarly, ETSO members in Continental Europe have been applying their own system. Since the beginning of 2004, the TSOs belonging to Nordel have also been involved in ETSO's system.

In the compensation system applied, transit transmissions are determined on the basis of imports and exports. Transit is the smaller volume of the hour-specific exports or imports. The definition itself is theoretical, and in practice it does not correspond to the actual flow of electricity in the grid. Still, it is simple and easy to use since the calculation process does not require separate network calculation software.

ETSO's compensation system consists basically of two parts. The first phase determines the costs of each country caused by transit. In the second phase, it is determined how to finance the costs caused.

When the annual transit volume (MWh) is divided with the sum of consumption and transit of the country in question, the result is a transit coefficient which describes the proportion of transit energy of all energy transmitted in the country's main grid. When this transit coefficient is used for multiplying the annual cost of the main grid (value of grid, losses, operation and maintenance costs), the result is the compensation to be paid to the TSO in question for transit. In 2004, the total sum of these compensations in ETSO's compensation system is estimated to be approx. 360 million euros.



Example of the calculation of transit compensation:
Transit 5 TWh per year, consumption 80 TWh → transit coefficient 5/(5+80)= 5.8%.
If the annual cost of the main grid is 100 million €, then the compensation received by the TSO for transit is 5.8% x 100 million € = 5.8 million €


Photograph by Futureimagebank

Two components in the financing system

The transit compensations to be paid to the TSOs are financed through two components. Energy imported from countries outside the agreement system is subject to an injection fee of 1 €/MWh. This is expected to amount to approx. 20 million euros in 2004.

The remainder of the financing need, approx. 340 million euros, is covered by the countries involved in the compensation system through a proportionate share which is determined on the basis of the netflow factor. Netflow refers to the difference between electricity imports and exports in each country during a specific hour, i.e. in practice it is that volume of energy where the country has a surplus or deficit in its energy balance (net imports or net exports).

For Fingrid, this solution means that the company obtains a compensation for transit when electricity imported from Russia flows through Finland to Sweden or when imports through the alternating current connections in the north from Norway and Sweden are exported through the Fenno-Skan cable to Sweden.

Correspondingly, Fingrid takes part in the funding of transit costs of other countries by means of the injection fee levied on imports from Russia and by means of its proportion of the sum of net imports and exports of all countries.

The financial significance of this arrangement for Fingrid varies on the basis of the transmission situation in both Finland and the entire ETSO area. However, a situation where electricity is imported from Sweden is more expensive for Fingrid than an export situation. This is so because in an import situation there is no transit transmission in Fingrid's grid, for which Fingrid would receive compensation, and at the same time the net imports increase its financing share.

Fingrid's financing share in 2004 is expected to be approx. 5 to 10 million euros higher than the transit compensations received by it.

Minor changes to be expected

ETSO's current agreement covers 2004. For 2005, the arrangement will be influenced by the guidelines specified by the Commission of the EU. However, it is anticipated that the changes to the current system will be small.

Great Britain and Ireland, which have been outside the arrangement until now, are also expected to join the system. The EU regulation will also concern the Baltic countries which are developing a compensation system of their own on the basis of the future guidelines of the EU Commission and ETSO's model. Since there are no physical transmission connections to the other parts of Europe, there are no grounds for the Baltic countries joining ETSO's system.

The goal of flexible procedures in cross-border electricity trade is not achieved solely by agreeing on transit. Congestions in the transmission grid and the principles applied to their management together with the harmonisation of grid tariffs will require much additional effort and provide the European TSOs and authorities with challenges when creating the conditions for a well-functioning electricity market.

Nordel
proposes five new connections to reinforce the Nordic electricity market

According to Nordel, the Nordic transmission system needs five new cross-border electricity transmission connections. The new lines will enable increasingly better functioning of the Nordic electricity market and improve the supply reliability of electricity.

Nordel, the co-operation organisation of the Nordic TSOs, presented its plan in its annual meeting in Hämeenlinna, Finland, on 9 June. According to Nordel, there is a need to reinforce the following connections:
- Fenno-Skan between Finland and Sweden
- Great Belt connection in Denmark
- Connection between Central and Southern Sweden
- Nea-Järpströmmen between Norway and Sweden
- Skagerrak connection between Denmark and Norway.

These reinforcements of the transmission grid constitute a single entity with no mutual prioritisation. The total costs of the reinforcements will be approx. 1,000 million euros.

According to the plan, all reinforcements will be completed around 2010, and once ready, they will provide the operating conditions of the Nordic electricity market with a considerable improvement. The report on the Nordic electricity transmission grid has been published on Nordel's home pages (www.nordel.org).

In years with exceptionally little rain, the Nordic electricity production capacity cannot cover consumption in the region, says Nordel. For the same reason, 17 terawatt hours of electricity was imported into the Nordic countries from the neighbouring regions in 2003; this volume corresponds to roughly 5 per cent of the total consumption of electricity.

The annual meeting stated that the electricity market managed the drought which prevailed in the Nordic countries in 2002 and 2003 rather well. This drought presented a serious challenge to electricity supply, and electricity transmissions between the Nordic countries were very high during it.

Nordel stated that the Nordic power system must be reinforced both by increasing production capacity and by reinforcing the transmission grid.

The market players are responsible for constructing sufficient electricity production capacity. Price signals on the electricity market encourage both savings in consumption and necessary investments in production capacity.

Finland has decided to build a new nuclear power unit of 1,600 megawatts. A gas power plant of 260 megawatts is planned for Gothenburg, and a total of 400 megawatts of new wind power is being built in Denmark. There is no certainty of the construction of other additional production capacity.

Nordel wished to secure its planning and operating criteria for the Nordic power system after several simultaneous disturbance situations in the power system interrupted electricity supply in Southern Sweden and Eastern Denmark in September 2003. The intermediate report accepted in the annual meeting did not reveal considerable needs for changes.

Nordel's new Chairman for the period of 2004 to 2006 elected by the annual meeting is **Jan Magnusson**, Director General of Svenska Kraftnät. The Deputy Chairman elected is **Timo Toivonen**, President of Fingrid.

Timo Toivonen

The total electricity consumption in the Nordel countries in 2003 was 389 terawatt hours (TWh) (-2.1%)*. The total volume of electricity transmission between the various Nordel countries and with neighbouring areas was 62 TWh. Electricity consumption in the individual countries was as follows: Denmark 35 TWh (0.0%), Finland 85 TWh (+1.0%), Iceland 8.5 TWh (+1.2%), Norway 115 TWh (-4.9%) and Sweden 145 TWh (-2.2%).

** Change from the previous year in brackets.*

Fingrid retained its position in the TOP LEAGUE OF GRID MAINTENANCE

The quality and cost efficiency of maintenance of the Finnish main grid were ranked among the top league for the fifth time in an international benchmarking study.

TEXT BY JARI HELANDER
PHOTOGRAPHS BY JUHANI ESKELINEN

The first international benchmarking study in maintenance within the main grid business was conducted 10 years ago, and since then the quality, efficiency and economy of maintenance have been assessed at intervals of two years. The purpose is to seek the best practices and methods and to learn from each other.
The most recent study covered the performance in 2002 and involved 25 different main grid companies from all parts of the world.

Comparison on an identical scale

The costs of maintenance and local switching of each company together with their security of supply were adapted on an identical scale on the basis of jointly agreed principles (taking into consideration issues such as different taxes, social expenses, network structures etc.). The goal of standardising the initial information is to enable comparisons as if the companies had identical grids (105 substations and 14,000 kilometres of transmission lines).

The participants provide their information for shared used confidentially but very openly, because the companies do not actually compete with each other.
A consultant processes the information into various tables by means of which the key figures of the companies can be compared.

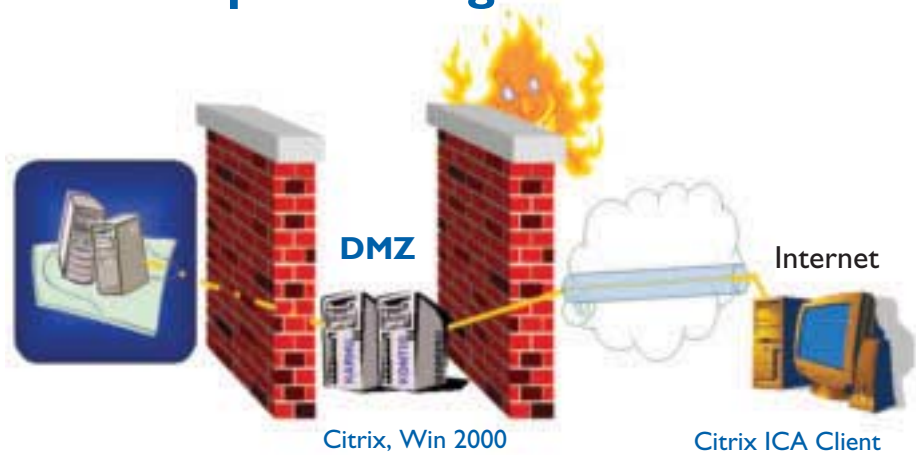
Fingrid remained among the best

In the comparison of individual sectors, Fingrid was among the best companies in the overall management of transmission line maintenance, in maintenance work for transmission lines, and in the maintenance of instrument transformers and circuit breakers. These central areas of maintenance have been Fingrid's strengths also in the earlier studies.
Moreover, Fingrid was among the best participants in contract management and performance management.

FgPartners service attracted much attention

Companies which were most successful in each sector presented their way of working to the other participants in

Technical description of FgPartners service



Fingrid intranet
• network data system and drawing databases

FgPartners extranet
• shared disc space
• FgPartners intranet
• office software
• maps
• instructions

Service provider
• ordinary PC with internet

the final meeting arranged between all companies which participated in the benchmarking study.

Fingrid's representatives presented issues such as maintenance of relays and circuit breakers, carrying out local switching with the service provider, and the FgPartners service developed to facilitate co-operation with service providers.

FgPartners attracted more interest than any other topic in the final meeting. A laptop was used for connecting to Fingrid's data systems from San Diego, USA, in the same manner as any one of the 300 representatives of Fingrid's service providers does every day. Fingrid's people presented how easy it is to retrieve drawings of substations and to save data in the Elnet data system.

The fact that the drawings of all substations exist in an electronic format and the ease and reliability of using the data systems by those employed by different service providers attracted much positive attention.

Learning and support from the benchmarks

Even though Fingrid has been successful in the benchmarking studies, it has always assumed new practices from the other benchmarked companies and received confirmation for its own choices from them.

A dozen or so persons have participated in the compilation and analysis of the necessary data at Fingrid. In each sector, they have found issues that can be developed further, and the other participating companies have had something to give to Fingrid.

Thanks for Fingrid's good success are due to our proficient and progressive personnel, long-term utilisation of data systems, and highly competent service providers.

LOSSES in main grid transmission can be optimised

The volume of losses created in main grid transmission in Finland has varied around one terawatt hour annually. This corresponds roughly to the annual electricity need of the city of Turku, one of the biggest cities in Finland. However, it is possible to influence the losses both through Fingrid's own action and through co-operation with the neighbouring countries.

TEXT BY AILA ITÄPÄÄ PHOTOGRAPH BY JUHANI ESKELINEN

The volume of loss energy in the Finnish main grid has varied from 0.9 to 1.2 terawatt hours annually. This represents more than 1 per cent of the total consumption of electricity in Finland, which in 2003 stood at 84.7 terawatt hours.

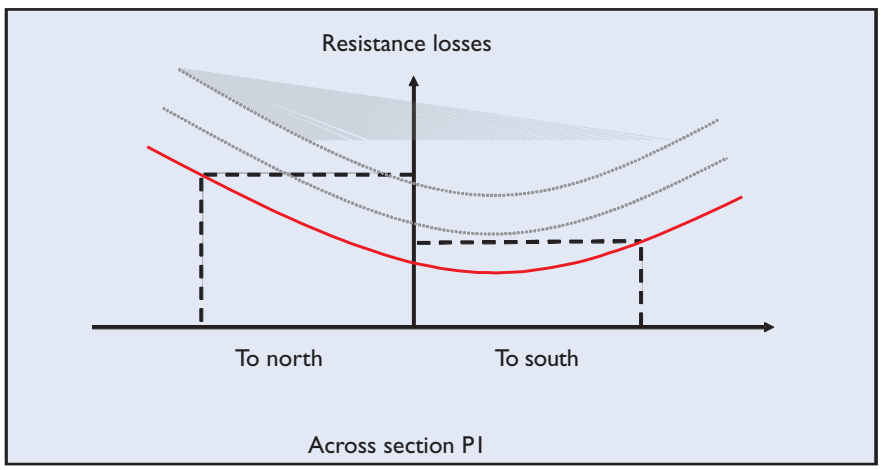
The total loss power on an hourly level ranges between 60 and 300 megawatts depending on the prevailing transmission situation and corona losses; the average losses are about 130 to 140 megawatts. In other words, it takes about one relatively large power plant to produce the power consumed by losses.

Corona losses can account for more than half of the total losses on an hourly level, but on an annual scale their share of the total losses is approx. 10 to 15 per cent. Corona losses are at their highest in the winter months when an ice load accumulates on the conductors.

Most of the electric energy consumed by the losses turns into heat.

To put it simply, resistance losses behave as shown in the figure. The red curve describes resistance losses at a certain value of total consumption in Finland. The losses change as a function of the north-to-south transmission in Finland (transmissions across section P1) so that minimum resistance losses are achieved at a certain transmission value in southbound transmission.

The grey broken lines describe the resistance losses at higher values of total consumption in Finland. The magnitude of resistance losses can be influenced by changing the power of the Fenno-Skan direct current connection between Finland and Sweden.



Loss electricity from the electricity market

The electricity consumed by losses in the main grid is acquired by Fingrid itself. The loss electricity is purchased through long-term bilateral contracts, from the electricity exchange, or through temporary transactions with electricity suppliers.

In terms of the purchase of loss electricity, Fingrid aims to achieve zero balance error between procurement and consumption. The difference between electricity purchases and actual losses is covered by means of balance power whose volume is settled afterwards on an hourly basis.

Loss electricity purchases are assisted by a status estimator which calculates the losses by utilising the real-time measurements carried out within the operation control system.

Automatic voltage control

When engineering and constructing an electricity network, the losses must always be taken into account when calculating the profitability of the investment.

In network operation, the losses can be influenced by voltage control. Resistance losses are reduced and corona losses are increased when the voltage rises. Voltage is adjusted by means of reactors in the 400 and 220 kilovolt networks, by means of on-load tap-changers in transformers, and by means of capacitors in the 110 kilovolt network.

Voltage control has been automated: the voltage control equipment is regulated by controllers on the basis of preset voltage limits.

In an abnormal situation, control can take place manually from the Power System Control Centre or from the Network Control Centre. Such an abnormal situation can be, for instance, when the climate conditions are favourable for the generation of corona losses.

Network calculation software facilitating

Network calculation programs facilitate the optimisation of losses. The voltage optimisation program in the operation control system calculates the

optimum voltages for each substation at regular intervals, using the real-time situation as the basis.
The optimisation process takes corona losses into account.

In a situation where corona losses occur, the goal is to decrease the voltages in the 400 kilovolt network as low as possible, taking the current operating situation into account. In the 110 kilovolt network, the goal is to keep the voltages as high as possible while taking into account the regional network restrictions. A high voltage is the goal here since there are no significant corona losses in the 110 kilovolt network.

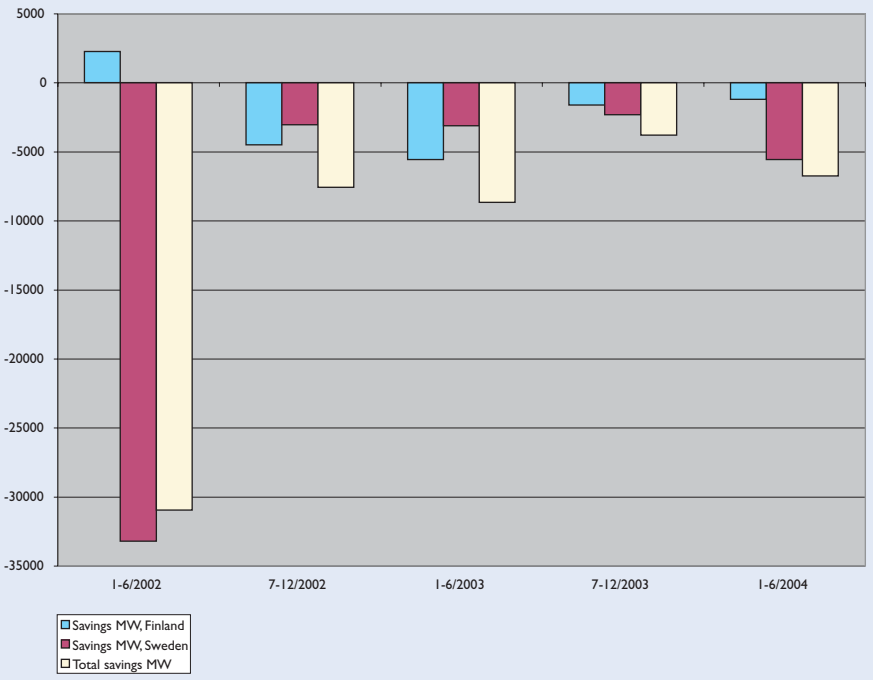
The set values of the controllers are selected from the calculation results of the PSS/E network calculation software so that the optimised voltage profile can be achieved.

In reactor control, three different control windows are available. The lowest control window is used in a corona loss situation. If the corona losses are higher than the resistance losses, both reactors and on-load tap-changers are controlled manually.

Considerable savings through co-operation

The Fenno-Skan direct current connection can be used for controlling the power between Finland and Sweden to travel in an optimum manner in terms of losses. It is for instance possible to relieve power transmission from Northern Sweden to Southern Sweden when the entire capacity of this connection is not used otherwise. Fingrid and Svenska Kraftnät run this connection in an optimum manner in order to reduce the shared losses.

Savings (in megawatts) achieved through the optimisation of power transmission on the Fenno-Skan direct current connection in 2002 and 2003 and during the first half of 2004.



In 2003, approx. 12,500 megawatt hours of losses were avoided by running the power of the Fenno-Skan connection optimally, and approx. 6,700 megawatt hours of such losses were avoided during the early half of 2004. In 2003, some 620 single-family houses heated with electricity would have obtained their electricity through these savings.

Fingrid involved in energy conservation agreement

Fingrid has joined the energy conservation agreement for the electricity transmission and distribution business in Finland. This agreement conforms to a policy decision made by the Finnish Government in 1995. Energy conservation also constitutes one part of Fingrid's environmental management system.

In the autumn of 2003, energy reviews in accordance with Motiva's guidelines were carried out at the Ruotsinkylä and Nurmijärvi substations. The reviews were conducted by authorised Motiva energy review auditors **Lauri Suomalainen** and **Petri Antikainen** of Kupari Solutions Oy, and the reviews received financial support from the Ministry of Trade and Industry.

The reviews aimed to study the energy consumption of the substations and their potential for energy savings. The reviews indicated that savings can be achieved by reducing the internal temperature of the buildings to +15°C, and by ensuring that the thermostats have been placed appropriately and that the exhaust air fans work properly.

The experiences obtained from the reviews will be taken into account both in maintenance and in the engineering of new substations.

Photograph by Futureimagebank

New Fenno-Skan connection being prepared

Fingrid and Svenska Kraftnät, the transmission system operator in Sweden, have drawn up a feasibility study of a new electricity transmission connection between Finland and Sweden. According to the study, the new cable connection due to run parallel with the existing Fenno-Skan cable is viable.

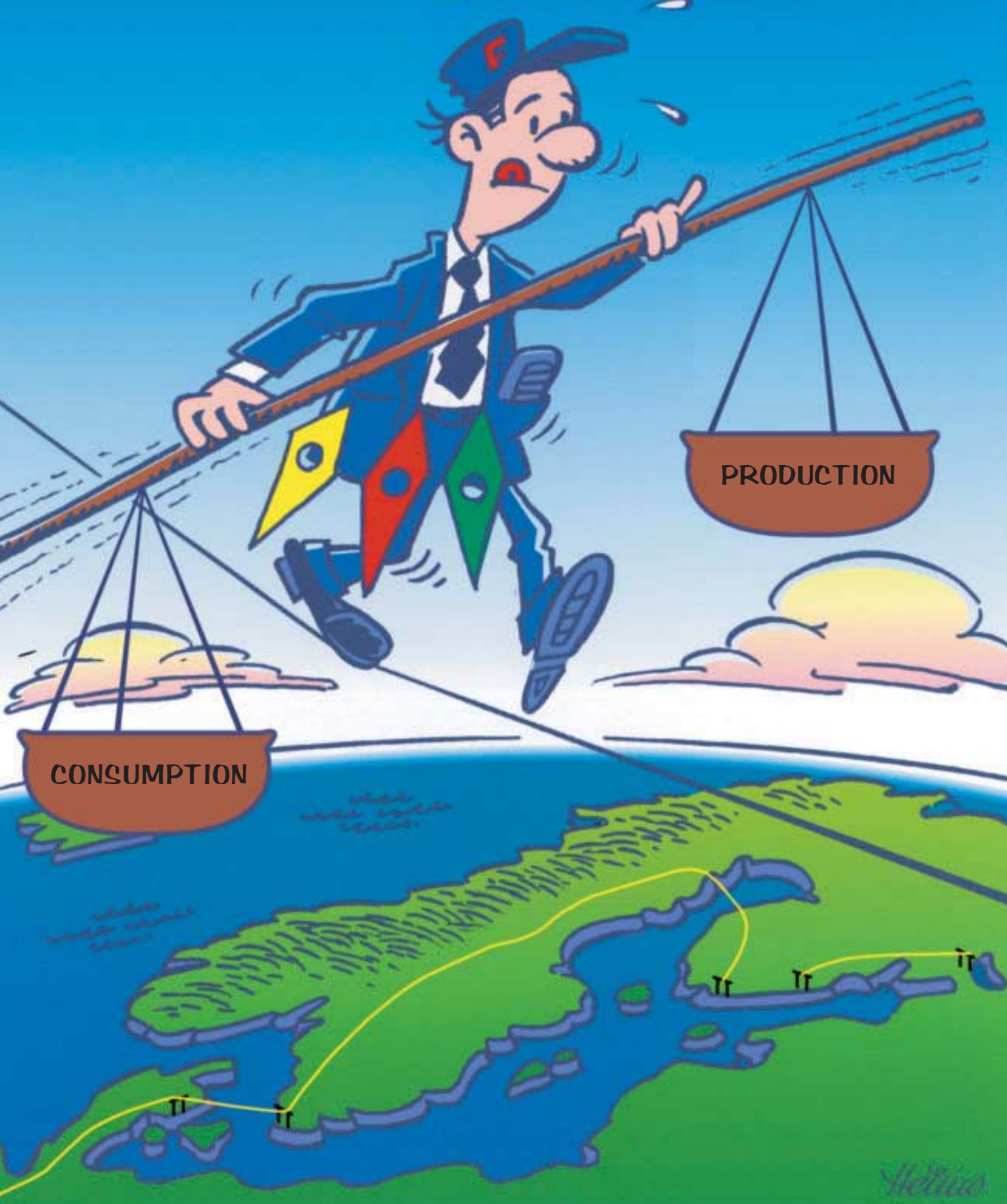
The new cable connection is part of the development plan for the transmission grids in the Nordic countries, assessing the reinforcement needs of the transmission connections and their viability on the basis of the electricity consumption and production forecasts for the coming years. The increase in transmission capacity brought by the cable connection will improve the functioning of the Nordic electricity market as it will reduce transmission congestions between Finland and Sweden. Supply security of electricity will also improve.

According to the feasibility study, the new connection will provide economic benefits mainly to the electricity market parties.

The power of the new connection will be 600 – 800 megawatts. The connection will consist of a sea cable of approx. 200 kilometres and of power converter stations to be built at both ends of the cable. The estimated costs of the connection are more than 200 million euros.

In Finland, the new connection will be connected to the main grid at the Rauma substation, and it does not require any other grid reinforcements in Finland.

Fingrid and Svenska Kraftnät have launched detailed execution engineering of the project. Final decision concerning the construction of the connection will be made during the early part of 2005. The new direct current connection is expected to be ready in 2010.


PRODUCTION
CONSUMPTION

Renewal of reserve agreements well in progress

There has been good progress with the negotiations on the renewal of maintenance agreements concerning reserve capacity for the power system. The agreements are used for making preparations for potential disturbance situations in the power system, such as a malfunction in a major power plant. The new agreements will also take into account the connection of the third unit at the Olkiluoto nuclear power station to the Finnish power system.

TEXT BY Jarno Sederlund ILLUSTRATION BY Heimo Suomalainen

During the summer, Fingrid signed agreements on industrial consumption loads which can be disconnected in the event of disturbance. Negotiations concerning reserves maintained at power plants will continue in the autumn. The costs of these agreements for Fingrid are approx. 10 million euros per year.

The reserve capacity is needed for balancing production and consumption in the power system and for managing various types of disturbance situations. The Nordic transmission system operators have agreed mutually how much reserves are to be maintained in each country. In Finland, Fingrid is responsible for acquiring the necessary reserves through agreements which are currently valid until the end of this year.

Power of disconnectable loads more than doubled

The agreements on disconnectable loads have been signed with seven companies operating in the wood processing, chemical and metal industries. The annual availability of the disconnectable loads participating in the maintenance of reserves is at least 7,000 hours, and their net effect is at least 15 megawatts.

In line with the new agreements, the total power of disconnectable loads reserved by Fingrid will grow from the current 400 megawatts to approx. 1,000 megawatts.

The agreements will be valid from 2005 to 2015, and they also take into consideration the continued security of supply of the power system after the fifth nuclear power unit in Finland goes on stream.

The new unit at Olkiluoto will almost double the size of the biggest power plant unit connected to the power system. The impacts of the new unit on the grid will be reduced by means of separate system protection scheme which will cut off 300 to 400 megawatts of industrial loads immediately if the new nuclear unit gets disconnected from the main grid.

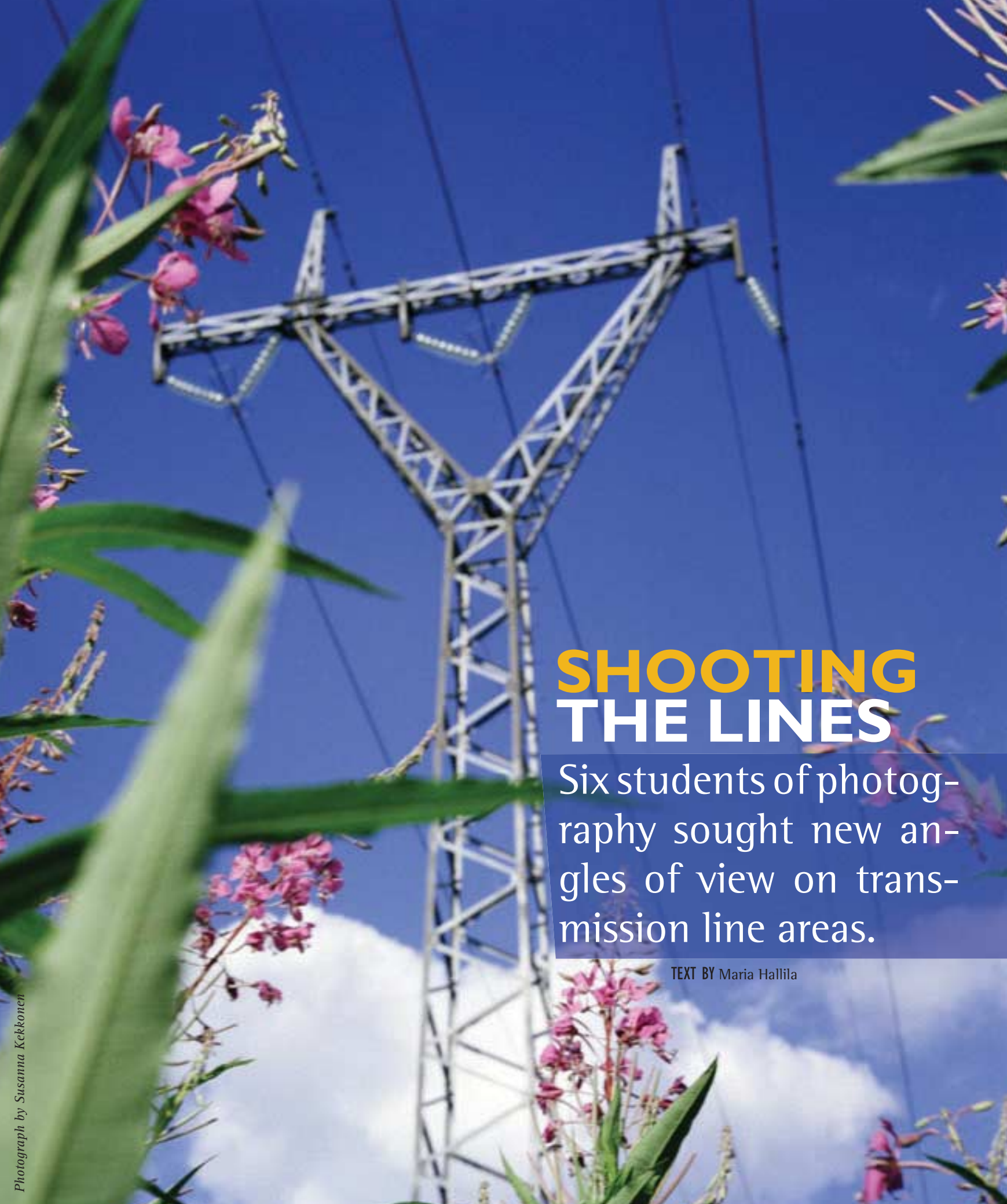
Three-year agreements as the goal for power plant reserves

Power plant reserves which are activated automatically as a result of a frequency error in the main grid are maintained in Finland through a so-called reserve bank model. Companies with power plants can report their generators, which fulfil the required regulation conditions, for use by the reserve system.

The agreements concerning the maintenance of power plant reserves, signed with the owner companies, are identical as regards their terms and pricing. The goal is to conduct the related negotiations with the various parties so that the agreements could be signed by the end of November.

The intention is to continue the current proven maintenance model so that the agreement period would the same three years as with the main grid agreements.

Most of the power plants participating in the maintenance of reserve capacity are hydropower generators where the nominal power must be at least 10 megawatts. Moreover, the sufficiency of regulation capacity of the generators must have been verified through separate measurements.



SHOOTING THE LINES

Six students of photography sought new angles of view on transmission line areas.

TEXT BY Maria Hallila

Photograph by Susanna Kekkonen

Photograph by Juhani Eskelinen

Photograph by Noomi Ljungdell

Susanna Kekkonen (on the left), Noomi Ljungdell and Linda Laakso found many familiar photographs in Fingrid's annual report.

A group of students of photography at the University of Art and Design of Helsinki were given an assignment by Fingrid in the spring of 2003: to photograph transmission lines from new perspectives. Third-year students **Susanna Kekkonen, Linda Laakso, Noomi Ljungdell, Jaana Rannikko, Liisa Valonen** and **Ea Vasko** examined transmission line areas through their camera lenses in the Helsinki and Hämeenlinna regions.

Photograph by Ea Vasko

The purpose of this co-operation was to give the young photographers an opportunity to show their skills with a topic relating to everyday technology, infrastructure and society. The project was also hoped to provide new photographic material for Fingrid's publications; results of the assignment have been published in Fingrid's annual report 2003, among other places.

The students first learned to know the topic of their assignment and Fingrid through customer magazines, brochures and annual reports. These also opened views into the visual world involved in transmission lines.

"We were given total freedom to observe the transmission lines from the viewpoint of laypersons and photographers. We were able to seek our own artistic perspective and to forget the conventional approaches," Susanna Kekkonen says. Together with Linda Laakso and Noomi Ljungdell, she gave an account of the phases and experiences of the photography project at the Department of Photography in August, just before the beginning of a new academic term.

Away from the obvious choices

According to Noomi Ljungdell, the most challenging – and also the most interesting – thing in the project was to find a new approach to something that has conventionally been done in a certain way. "At first, you had to remind yourself constantly not to pick the most obvious and easiest choice but to try to get beyond it."

Having worked at an advertising agency, Susanna Kekkonen has got used to giving preference to the customer's viewpoint. She also admitted that at first it was difficult to rid oneself of the traditional viewpoint and to have the courage to venture on one's own visions.

Linda Laakso seems to have had least problems in adapting an artist's liberty to the concrete assignment. "I forgot the customer. I just took photographs of things that appealed to me visually," she says.

Acquaintance with robust steel

The first concrete step required by the project was to acquire information on transmission lines included in the main grid, running to the Helsinki region. The project participants then had to find their way to transmission line areas and towers.

Close encounter with these steel structures was a new, even somewhat exciting, experience to all three.

"I climbed to the base of a tower located on a hill. From there, I could see the line very far away. It was a stately sight, and suddenly there was a loud humming sound. First I thought that the sound came from the lines, but a hot-air balloon soon emerged from behind the tower," Susanna Kekkonen says. A photograph of the hot-air balloon with its Voimatori logo on the side, seen through the lattice structure of the tower, is now included in her series of photographs.

Noomi Ljungdell says that she is used to seeing transmission lines in her immediate surroundings since childhood, because her home is located in Puistola near Ring Road 3, in an area where heavy-duty power lines run side by side.

"As far as I can remember, the lines have always been there, and I haven't paid much attention to them. When it rains, they sometimes make a buzzing sound. I have occasionally heard people ponder over the potential health impacts of electric fields, but I have always trusted that someone measures them and keeps an eye on them."

She is the only member of the group who also included a person, a cyclist near a transmission line, in her photographs.

One of the angles of view selected by Susanna Kekkonen opens daringly from the base of a tower straight up towards the peak. Photographs from the same angle were also taken by Jaana Rannikko and Liisa Valonen, who has intensified the impression of the massiveness of the large structures by using a fish-eye lens.

Unlike the other photographers, Ea Vasko selected the Tammisto substation as her topic, focusing exclusively on its equipment.

Line monitoring became a habit

The photography project managed to broaden the consciousness and world view of the students involved in at least one sense: it now also encompasses electricity transmission.

"Earlier, I had no idea of this kind of thing. Electricity was just there, in the socket on the wall," Linda Laakso admits.

Photograph by Linda Laakso

"Nowadays, it has become something of a habit to observe transmission lines for instance while driving a car," Noomi Ljungdell continues. "Before this, I didn't know that the lines running beside the road may be owned by several companies or that the lines included in the Finnish main grid have been built by several different parties."

Fingrid's landscape towers have appealed to all of the project group members. They hope that scenic aspect and aesthetics would gain even more emphasis in transmission line construction than currently.

More ideas in store

As a result of the photography project, Fingrid now has access to about 40 new types of photographs of transmission lines, towers, other electricity transmission equipment, and sceneries at transmission line areas. The photographs reveal the different 'handwriting' of the six photographers, their way of seeing and depicting their topic.

Of the group members, only Susanna Kekkonen had time to take her photographs in the summer. The others started on the assignment during late autumn, which seems to have made the impressions conveyed by the pictures somewhat gloomier.

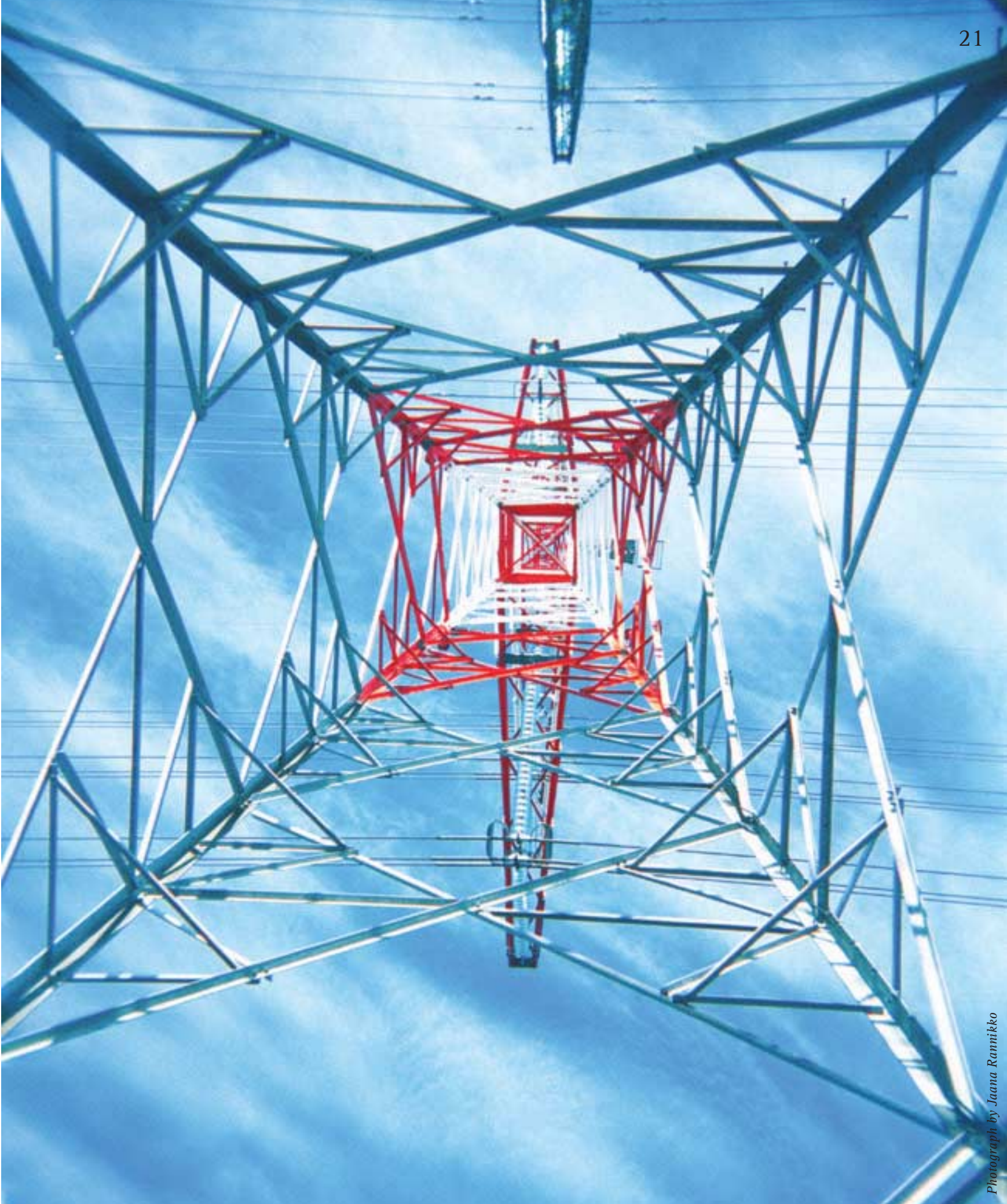
On the other hand, the bare landscape after the leaves have fallen is also an opportunity to a photographer. "In my pictures, autumn is 'the thing'," Linda Laakso says. In her photographs, the branches of conifers and leafless birches, transmission lines and tower structures are outlined against the grey sky as dark graphic elements.

When asked whether this topic would have something more to offer, all three say 'yes'.

"We did not come sufficiently far away from documentarism. We could try to be even more abstract," Noomi Ljungdell thinks.

The three women are caught by the idea of how to portray the topic without shooting the actual transmission lines. They are also fascinated by the idea of once shooting transmission lines from above – for instance from a hot-air balloon – and not just from ground level.

Photograph by Liisa Valonen



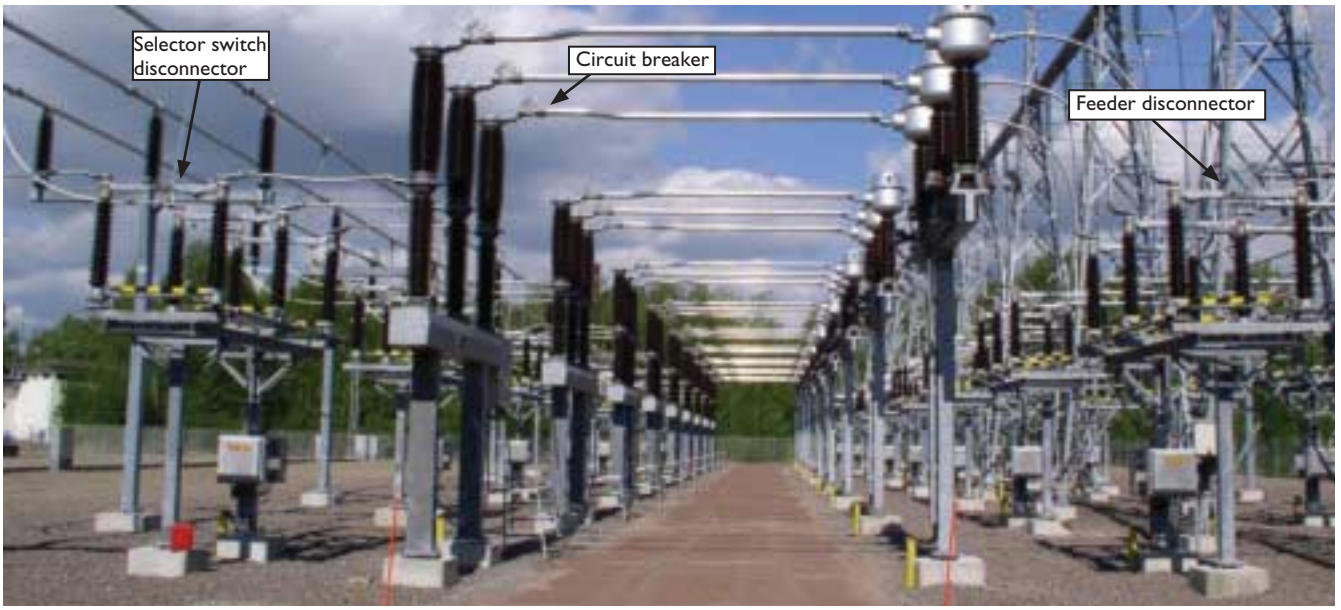
Photograph by Jaana Rannikko

GRID ABC
This article series deals with the main operating principles, equipment units and components in the main grid.

Switching devices

The purpose of switching devices in an electricity network is to control the flow of energy, separate a faulty part of the network quickly from the remaining network, and to serve as a point of separation between the different parts of the network.

TEXT BY Tuomas Laitinen



At a substation, there is one circuit breaker per each bay (such as a bay for an outgoing transmission line) and usually 3 to 4 disconnectors to enable various switching situations and to improve the availability of the network (for instance in conjunction with equipment maintenance and damage).

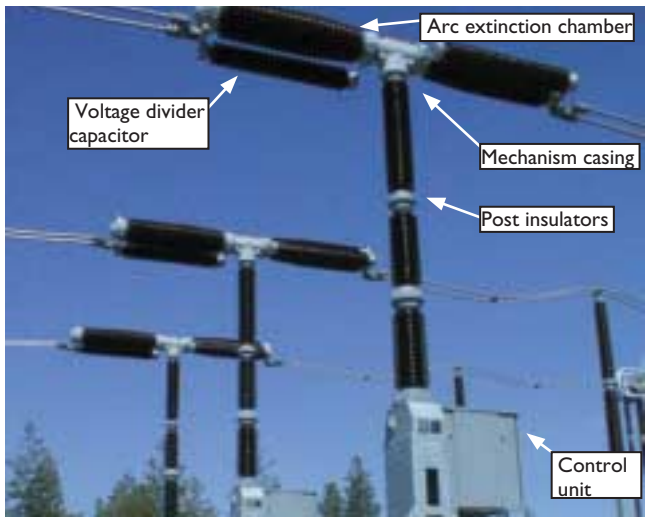
Transmission lines, transformers and compensation equipment are joined to busbars by means of switching devices at substations.

Switching devices include circuit breakers and disconnectors, which when closed during a normal state of the network conduct a load current, and while in the open position, they separate different parts of the network from each other. Circuit breakers are used to open and close a circuit, irrespective of the presence of load current or fault current, which may be many times higher than the nominal current.

Circuit breakers can be operated manually or automatically. Automatic operation is typically triggered by a fault situation in the network, which leads to a tripping signal to a circuit breaker given by protective relays. Automatic closing is started by automatic reclosing relays.

The circuit breakers used by Fingrid are divided into the following categories based on the medium used in the arc extinction chamber:

1. SF_6 circuit breakers
2. Oil-minimum circuit breakers
3. Air-blast circuit breakers



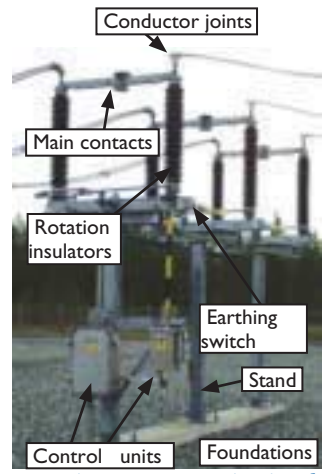
Structure of circuit breaker.

In a breaking event, *the current is not cut immediately once the main contacts of the circuit breaker open, but the circuit remains closed by means of an electric arc which is created between the arcing contacts.*
The electric arc has a fundamental role in the breaking event: at a high current, the conductivity of an electric arc is good, enabling the opening of the main contacts to a sufficient distance from each other so that the created clearance between open contacts can endure the recovery voltage when the arc goes off. When the current decreases, the resistance of the arc increases, and especially so at the zero point of the current when it is cooled suitably.

The new circuit breakers purchased are exclusively SF_6 breakers. The SF_6 gas is odourless, non-combustible, fully non-toxic while pure, and its density is about five times greater than that of air at a temperature of 20°C. The gas also features very good insulating strength and a great electric arc cooling capacity. These factors render it a good breaker gas.
However, SF_6 circuit breakers are not fully trouble-free. The use of SF_6 gas at low temperatures is restricted by its liquefaction, which leads to reduced density of the gas and hence to its poorer insulating strength.
The higher the density used in the circuit breaker, i.e. on the other hand the better the breaking capacity of the device, the earlier the liquefaction process begins, and it is necessary to restrict the permitted operating temperature range. The problem can be overcome by using a suitable mixed gas ($SF_6 + N_2$) and a sufficiently low partial pressure of SF_6, enabling the extension of the permitted operating temperature range down to –50°C. However, the insulating strength of the mixed gas is not fully comparable to that of pure SF_6 gas, which is why the design of the circuit breaker is somewhat different.

Moreover, the gaskets of the gas pipes and flanges of the breakers are put to the test at low temperatures and also during great temperature variations. These gaskets have sometimes turned out to be problematic as they cause leaks into the atmosphere.
SF_6 has been categorised as a greenhouse gas. For this reason, its use must be controlled, and detrimental emissions must be kept to a minimum through all available means. Leaks account for approx. 0.2 per cent of the total gas volume in Fingrid's equipment on an annual scale, i.e. they are very small.

Structure of disconnector.



The purpose of disconnectors *is to achieve a safe and reliable clearance between the open contacts of a separated circuit and the remaining network and to make a particular part of the substation dead for safe working. For this reason, the clearance between the open contacts must be either visible or the status information must be shown by means of a reliable mechanical position indicating device. Moreover, the clearance between the open contacts of a disconnector is subject to a more stringent insulating strength requirement than to a requirement concerning insulation against ground.*
Disconnectors can be equipped with earthing switches on one side or on both sides. Earthing switches are used for instance for providing a worksite with short-circuit-resistant temporary earthing for work.

The most common disconnector type used is the two-pillar centre-break disconnector shown in the enclosed picture. Other common disconnector types are vertical and horizontal break and pantograph disconnectors, which feature benefits such as small need for installation surface.
In the Nordic climate conditions, the mechanical durability of disconnectors requires special attention. The disconnector must work even at low temperatures of –50°C or when the disconnector is covered by ice 20 mm thick. The fulfilment of these and other requirements is monitored through type tests.

Centre-break disconnector in an icebreaking test (Hapam SSBII-123)

Photograph by Futureimagebank

EIA processes for three significant line projects completed

The environmental impact assessment (EIA) processes of transmission line projects Ulvila – Kangasala, Olkiluoto – Metsäkylä (Huittinen) and Loviisa – Hikiä (Hausjärvi) were completed in the summer. The further planning of the two first line routes is primarily based on the existing line routes, while a reservation in the regional zoning plan is suggested for the Loviisa – Hikiä line.

■ Fingrid has chosen the route options for the further planning of the 400 kilovolt transmission lines to be constructed from Ulvila to Kangasala and from Olkiluoto to Metsäkylä in Huittinen. These options mainly follow the routes of existing lines. Instead, there is no immediate need for the third line route from Loviisa to Hikiä in Hausjärvi, because Eurajoki has been chosen as the location of the new nuclear power unit. The route selection is based on the EIA report, on the statements of regional environmental centres which served as the contact authority, and on the statements and opinions which came up during the EIA process. All of these are available on Fingrid's home pages (www.fingrid.fi).

Parallel towers used in the crossing of Lake Pyhäjärvi

The Ulvila – Kangasala line will cross Lake Pyhäjärvi, and Fingrid has chosen a parallel tower solution here for reasons of operation reliability. The use of double circuit towers would also be a more visible solution in terms of the scenery, since they are 25 metres higher than parallel towers.

The environmental impact follow-up programme required by the contact authority will be presented to the Government in conjunction with the expropriation permit application. In conjunction with the processing of the permit application concerning construction in the waterway, the environmental permit authority of Western Finland will specify whether there is a need to draw up a follow-up programme by virtue of the Water Act for the water impacts of artificial islets to be constructed for the tower foundations of the line section which will cross Lake Pyhäjärvi at Pirkkala.

In areas where there are considerable numbers of birds along the line route, there will be studies into whether birds have a risk of colliding with the transmission lines, and the lines will be provided with bird markers if necessary.

By virtue of a permit granted by the provincial administration of the Province of Western Finland on 20 April, Eltel Networks Oy has launched the engineering of the Ulvila – Kangasala line and the related field investigations. During this year, there will be field measurements which support engineering, and the tower locations will be marked and their soil will be studied.

The construction of the line is due to begin during the latter half of 2005. The project will be ready in the autumn of 2008.

Resting and breeding grounds of flying squirrels to be protected

The resting and breeding grounds of flying squirrels will be taken into account in the engineering of the Olkiluoto – Metsäkylä (Huittinen) line, and it will be ensured that these grounds are not destroyed or endangered during the execution of the project.

Empower Oy has launched the engineering of the line and the related field investigations by virtue of a permit granted by the provincial administration of the Province of Western Finland on 27 April. Some measurements will be carried out in the terrain during this year, and the tower locations will be marked and their soil will be studied.

The construction of the line is scheduled to begin during the latter half of 2005, and the project will be ready in the autumn of 2007.

Advance agreements as the goal with landowners

Eltel Networks Oy and Empower Oy have been in contact with the landowners before the actual field investigations for the line routes have commenced. Potential damage caused by field work will be compensated once the work is ready.

Before the construction of the transmission lines, Fingrid will apply for construction permits in accordance with the Electricity Market Act (368/1995) from the Energy Market Authority. For the use of right for the ground required by the lines, Fingrid will apply for expropriation permits from the Government at the beginning of next year. The expropriation permit applications present the technical solutions pertaining to the use of land. The actual construction work will begin once the advance takeover procedure based on the expropriation permits for the areas in question has become legally valid. The goal is to sign advance agreements with the landowners so that the work can commence before the expropriation permits are granted.

The clearing of trees is preferably arranged through joint felling and sale of timber during 2005 on the Olkiluoto – Metsäkylä line and during 2005 to 2006 on the Ulvila – Kangasala line.

No immediate need for the Loviisa – Hikiä (Hausjärvi) line

Fingrid proposes that the regional zoning plans include a route for a 400 kilovolt transmission line from Loviisa to Hikiä in Hausjärvi. There is no immediate need for the actual construction of this line because Eurajoki has been chosen as the location of the new nuclear power unit in Finland. However, the reservation in the regional zoning plan is necessary so that electricity transmission in the region can be secured also in the future.

The statement of the contact authority and the EIA report of this line route, too, are available on Fingrid's home pages.

IN BRIEF

Additional transformer capacity for the Kristiina substation

Fingrid Oyj and Empower Oy have signed an agreement concerning the upgrading of transformer capacity at the Kristiina 220/110/20 kilovolt substation.

■ The Kristiina substation situated in Kristiinankaupunki in Western Finland will obtain one additional 220/110/20 kilovolt main transformer. Moreover, the reactor capacity of the station will be increased by one reactor. The project also covers some basic renovation such as exchange of old 110 kilovolt instrument transformers on two bays and replacement of rigid insulators of busbars.

The new main transformer for the Kristiina substation will come from the Kalajoki substation; the transport, rigging and installation of the transformer have been ordered separately. The new reactor for the substation has been ordered from Trench.

The total price of the substation project to be ready in August 2005 is approx. 2 million euros.

New Huutokoski – Varkaus C transmission line commissioned

A new 110 kilovolt transmission line between Huutokoski and Varkaus in Eastern Finland was commissioned in early June. The line of 17 kilometres runs parallel with the former transmission lines between the Huutokoski and Varkaus substations within the areas of Joroinen and Varkaus.

■ The main contractor in the transmission line work was Eltel Networks Oy, with Voimatel Oy carrying out the construction work as its subcontractor. Voimatel also carried out the substation contract at Huutokoski involving a new bay for the new line. The western Huutokoski line situated in Varkaus was connected past the substation directly to the Pajaniemi area. The Huutokoski – Pajaniemi line thus created was commissioned at the end of April. The substation contract also involved replacement of relays and other renovation work. Moreover, Empower Oy carried out some renovation work relating to the project at Huutokoski last autumn.

Fingrid's transmission capacity on cross-border connections from Russia for 2005 has been reserved

Fingrid offers the electricity market parties electricity transmission service through its cross-border connections from Russia. At the beginning of 2005, a total of 900 megawatts of transmission capacity will become available on these lines. By the deadline which ended at the end of August, more than a dozen Finnish and other European market players made reservations for this transmission capacity. There was clearly more demand for transmission capacity than what was available.

■ The reservation situation for 2005 and the description of the transmission service can be found on Fingrid's home pages at www.fingrid.fi under Services. Fingrid will confirm the transmission reservations later in the autumn after having received an account of corresponding reservations on the transmission connections in Russia. Joint Stock Company FGC-UES is responsible for cross-border and main grid transmission of electricity in Russia.

Photograph by Jorma Heiskanen

Petri Hentunen (on the left) and Mika Kuivalainen have just reached the finish line after a quarter marathon.

Exercise event attracted families in Varkaus

The second Navitas marathon and Junnumaraton event for children were arranged in Varkaus on 19 June. There were running events from a distance of 100 metres for the 1 to 2-year-olds all the way to a full-length marathon for adults, and series for both men and women, not forgetting veterans.

■ Navitas marathon is a physical exercise event for the entire family, which again attracted many participants to try out their physical condition or just to enjoy exercise outdoors.

In conjunction with the event, there was also a seminar on how to sustain proper working ability, with **Tapio Korjus**, the Olympic gold medal winner in javelin, as one of the lecturers.

This year, Fingrid was one of the main partners of the event, and the personnel of Fingrid's Varkaus office participated in the event actively.

Art by two generations on display in Hämeenlinna

"Kiire?" (Rush?), collage by Pekka Hannula.

■ Exhibition "2 x Hannula" at the Hämeenlinna Art Museum from 18 September to 31 October will present graphic art, paper collages, item collages, drawings, drafts, photographs and paintings by **Simo** and **Pekka Hannula**, father and son, both of whom are foremost contemporary visual artists in Finland. Both artists have works representing the entire span of their respective careers. Fingrid is one of the sponsors of the exhibition.

Albert DiCaprio, FJM, Chairman of the TSO benchmarking group, presenting his views to the meeting participants.

International benchmarking meeting in transmission system operation in Helsinki

Fingrid arranged an international benchmarking meeting in transmission system operation at the Finlandia Hall in Helsinki on 17 to 18 June 2004.

■ The participants of the meeting were about 20 representatives of various TSOs from different parts of the world. The consultant in the benchmarking study was KEMA Consulting.

The meeting focused on the further development of comparison models and on ensuring the quality of information used in benchmarking.

Final results concerning the performance and efficiency of transmission system operation by the different TSOs can be expected at the end of the benchmarking period in the winter of 2005.

In conjunction with the meeting, Fingrid arranged a visit to the Power System Control Centre and thereafter a cruise with dinner in the archipelago.

The primitive and genuine in us

I was crawling, squatting and creeping. I was sleeping on the ground, sitting in the brushes making food. I was thirsty, hungry, sweaty, tired and dirty. Ecstatic and irritated. Again, I felt good to become acquainted with more primitive being and the primitive in me. Trekking in Lapland in Sweden revived something important in me.

Is this some internal need that is related to my age? I don't know. However, I have come to understand that the simple, reduced, original, genuine and modest appeals to me more and more. Maybe that is why this 'primitive' trekking week was and has been so important to me: being literally down to earth, feeling your smallness and humility before the beauty and grandeur of the natural environment.

In our normal urban life, we are accustomed to raising ourselves in one way or another: by a lift or in our thoughts, in our careers or through reputation. We are bigger, more, better, preferably above others or at least above the 'masses'. I can certainly remember many periods of boasting in my past. It is good for us all to find things that put our lives, thoughts and fantasies into proper perspective.

In recent weeks, there has been a lively debate in Finland about **Juha Siltala's** most recent book on the changes that have taken place in work during the past few decades. I will not go into it more deeply, I just state that this book is a good example of the necessity of versatile debate. Over and over again, we need to learn to ask ourselves and each other what is really important and less important in our own lives, in our family, in our work, in our society and in the entire world. One good example is: "What am I really aiming to achieve by getting myself exhausted in this life?" Of course, there are numerous and widely varying answers to this question, because we are different kinds of people who perceive life in different ways. However, the important thing is that each of us becomes aware of the values of our own lives.

This awareness has started to mean more and more to me. Even though I work as a trainer of workplace communities, I do not really believe that obtaining and sharing more information, looking at slide shows and browsing through thick folders of course materials accomplish significant learning and essential changes in people. Instead, I consider it important that we all become – through training or otherwise – aware of maybe just one considerable insight, observation, new thought, or need for change in attitudes or action. Awareness is beautiful and magnificent if it encourages you to bring up some topic, do something visible or seek new approaches.

Awareness means that you no longer stay silent when your heart urges you to speak; you no longer suppress, deceive and conceal when reality must be unleashed; you no longer sit idle when it is time to act in a new way. Awareness also means that you not only use your common sense but you also identify and bring to surface your true feelings.

I am increasingly convinced that both the energy and creativity of living and working are closely associated to doing things with affection and passion – not to forget cool judgement. During this year, I have clearly noticed that I am guided in this direction by wandering in the natural environment, by sceneries, plants and animals – by simplicity, even primitivity.

Lari Junkkari

Lari Junkkari is a theologian, writer, business coach, supervisor and trainer living in Tampere, Finland. He has a long career among Finnish migrants living in Canada and Sweden, working for the church in Finland, and in recent years as a value trainer of various organisations and as a management coach. His best known books have dealt with manhood ('Mieheksi joka olet', written together with Kaija Maria Junkkari) and on business values and ethics ('Yrityksen arvot ja etiikka', written together with Tapio Aaltonen). His most recent book 'Nykyajan paimentolaiset – työ ja koti maailmalla', written together with Kaija Maria Junkkari, discusses expatriates. His other professional interests include marital and family issues and human life cycle. His hobbies include nature activities and photography.

Photograph by Futureimagebank


2004

In this column, Fingrid's employees write about their one day at work. This time, the article has been written by **AIRI KROOK**, who works as a Telecommunications Service Assistant.

LET'S CALL EACH OTHER

In the morning before 8 o'clock, I walk the quiet corridors to check the condition of meeting rooms. I grasp a cup of coffee and head for my own post. Once the telephone exchange and PC are switched on, it is time to see what is ahead of me today.

I hope to have time to do the file updates which have been waiting for some time. I have received some e-mail messages. The most urgent ones concern meeting room reservations and serving for today. I'd better phone the kitchen right away to place the order. At that very moment, the exchange rings, so I pick it first.

While I'm still on the phone, the first visitors of the day arrive at my counter. After the telephone call, I welcome the visitors and make sure that their host is coming to receive them.

I say good morning to my colleagues who come to work. I pick the handset to phone the kitchen. Again, there is an incoming call on the exchange. A landowner wishes to know about the clearing of transmission line areas in Western Finland.

I finally reach the kitchen by telephone and place the order. I also have to send the order in writing.

A couple of reminders emerge on my screen: place an order for a teleconference and take care of the telephone matters of a new employee. Someone who has forgotten his access pass at home also comes to see me, someone else has something to correct in working hour recording, while a third person has something else ambiguous in these recordings. I write their details down and promise to find out what's wrong. Where was I? Oh yes, the teleconference. I place the order electronically and send the necessary information to the host of the meeting.

Some people from our Oulu office have arrived for a meeting, and I exchange a few words with them. This is interrupted when the telephone exchange rings again. This time, there is a call from Norway. I take a message because the person that the caller was trying to reach is in a meeting.

Someone from our Petäjävesi office phones to report their holiday details. There are already a couple of calls waiting in line! Luckily my colleague picks one of these and I take the other.

Another colleague is waiting at the counter. The telephone call turns out to be tricky, with a lot of special terminology and the caller having no idea of who takes care of the matter at Fingrid. I take a quick look at the colleague still waiting at the counter and try to show him that this might take some time. He gives me a smile and a nod.

The caller is conveyed to the right person, and I turn to the person waiting at the counter. His mobile phone is broken. I arrange a backup phone for him and call the telephone supplier that a phone is coming in for service. I also have to transfer the number and name data to a SIM card.

Then it is time to tackle the telephone connection of the new employee. I make a couple of calls and have the necessary information. I start creating the telephone data in the exchange system when the exchange rings.

It is something 'electrical' again. This time, the matter is solved quickly. I am pleased that I participated in the introductory course in electrical engineering; I knew what the caller was talking about!

I continue establishing the new extension and updating the other related information. My terminal reminds me of installing a conference telephone. I install the telephone in the meeting room and test that it works. When I am coming back, someone asks me to help with the camera in another meeting room. So, I enter the meeting room with many visitors and tackle the problem. After a feminine touch, the camera is revived.

Meanwhile, the telephone fitter which I had ordered earlier has arrived. I give him the details of the new connection, and he gets to it. I continue...what was I doing actually? Yes, the new employee. The updates fall into place and I go to 'wake up' the actual telephone machine.

I bump into the telephone fitter in the corridor. He wants me to check the connection; everything seems to be in order.

A glance at the clock shows that it would be time to go home. The most urgent duties of the day have been taken care of. I take a look at my notes, which would be gibberish to anyone else, and transfer the undone duties into the in-tray. This also contains the file updates which I did not even start today.

Photograph by Tuija Sorsa

FINGRID OYJ

Arkadiankatu 23 B, P.O.Box 530, FI-00101 Helsinki • Tel +358 30 395 5000 • Fax +358 30 395 5196 • www.fingrid.fi

Helsinki
P.O.Box 530
FI-00101 Helsinki
Finland
Tel. +358 30 395 5000
Fax +358 30 395 5196

Hämeenlinna
Valvomotie 11
FI-13110 Hämeenlinna
Finland
Tel. +358 30 395 5000
Fax +358 30 395 5336

Oulu
Lentokatu 2
FI-90460 Oulunsalo
Finland
Tel. +358 30 395 5000
Fax + 358 30 395 5711

Petäjävesi
Sähkötie 24
FI-41900 Petäjävesi
Finland
Tel. +358 30 395 5000
Fax +358 30 395 5524

Rovaniemi
Veitikantie 4,P.O.Box 8013
FI-96101 Rovaniemi
Finland
Tel. +358 16 337 71
Fax +358 16 337 801

Varkaus
Wredenkatu 2
FI-78250 Varkaus
Finland
Tel. +358 30 395 5000
Fax +358 30 395 5611