

FINGRID'S OCCUPATIONAL SAFETY PUBLICATION FOR SERVICE PROVIDERS ■ 2013

SAFETY ON THE LINES



THE FOREMOST
COMPONENT IN
OCCUPATIONAL
SAFETY IS
**THE RIGHT
ATTITUDE.**

page 4

SAFETY ON THE LINES

Fingrid's occupational safety publication 2013

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SAFETY IS KEY

Hundreds of employees of service providers work at Fingrid's worksites every year. In 2012, service providers accounted for a total of almost 600 man-years at Fingrid's sites. The safety and security of both the grid and those working on it are of utmost importance to Fingrid. Fingrid has worked for a long time to promote the safe working environment of service providers. We have focused on improving the working methods, guidelines, instruction, and tools. In the 2000s, the frequency and severity of occupational accidents sustained by service providers showed a downward trend.

Our objective is to achieve zero accidents at Fingrid's worksites. In order to attain this, we put more focus on occupational safety efforts in 2012, and we established a strategic development project aiming at improved occupational safety. At the same time, we also imposed sanctions on our service providers for the very first time: neglecting the use of personal protective equipment will lead to penalties. During 2013, we have also sent a dozen or so written complaints to those main contractors at whose sites these shortcomings have been detected. The 16 subprojects of the development project have also covered a variety of other measures in order to enhance the guidelines, working methods, and safety.

The occupational accident frequency of Fingrid's service providers in 2012 remained at the same level as 2011, but the accidents were more severe than earlier. The year 2013 was particularly poor in terms of the service providers' occupational safety. There was an accident leading to a fatality at Fingrid's transmission line construction site, and another very serious accident in which three people were injured. We are continuing our long-term work to promote occupational safety together with our service providers. We wish to use this new publication to remind all our service providers of the importance of safety at work.

We want everyone to leave our sites in good health at the end of the day. Safety is the number one priority for Fingrid. We hope that you pass this publication and our occupational safety message on to all of those who work at Fingrid's worksites. We enhance

occupational safety in co-operation with our stakeholders, and we welcome any ideas and comments on safety and the contents of this safety publication.



Kari Kuusela
Executive Vice President
Fingrid Oyj



ASSUME THE RIGHT ATTITUDE

Each employee can use small daily choices to influence one's own safety and the safety of the other employees working at the site.

According to Siemens' Innar Sepp and Empower's Tomi Salonen, the right attitude is the most important factor in occupational safety – both with the employees and the supervisors.

Text by Suvi Artti | Photograph by Matti Immonen

“I'll leave that hole without protection just for a moment” or “This can be done so quickly that I won't need the safety harness” can be fatal thoughts at a worksite. Growing numb to the risks is one of the worst threats in safety at work. Even if nothing goes wrong this time if you neglect the safety rules, you might not be lucky next time.

Towards zero accidents

“Accidents are bound to happen when you work long enough” is a pattern of thought that has no place at worksites. Accidents are not a mishap or

coincidence: instead, each accident can be prevented. For every serious occupational accident, there are hundreds of dangerous situations from which we have to learn. Near misses and safety observations are the best material for avoiding accidents.

Everyone who works at the site is required to intervene whenever a risk factor is detected – either by removing the risk factor or by informing the site manager immediately.

An accident can also happen equally to an old hand with a career of decades, to a summer worker, or to a manager visiting the site. All are subject to the same safety rules, and everyone must aim at zero accidents.

SAFETY IS A PART OF EVERYDAY WORK IN ANTTILA

The work related to the EstLink 2 cable between Finland and Estonia at the Anttila substation in Porvoo, Finland, is close to completion. Attending to occupational safety is a natural part of everyday work at the site.

The instruction of new employees on safety matters, the use of safety equipment, and weekly site reviews are the basic issues of occupational safety that are required by the Finnish Occupational Safety and Health Act, say Site Managers **Tomi Salonen** of Empower and **Innar Sepp** of Siemens. Empower is responsible for the extension of the AC (alternate current) substation, while Siemens is constructing HVDC (high voltage direct current) converter substation in Anttila.

Both companies use a form that was drawn up by Fingrid for the instruction of new workers. The issues reviewed depend on the type of workers: more issues apply to electricity workers than, for example, site assistants. Empower also uses additional material for ensuring that everyone obtains instruction with the same content, regardless of the instructor.

The site manager inspects every aspect of the site in the weekly safety review. In addition to the workers and their protective equipment, the other issues examined include electrification, hoisting equipment, ladders and scaffolding, area restrictions, and all vehicles. The review employs Fingrid's MVR form. If the inspection reveals serious shortcomings, they are always corrected immediately. Any smaller deficiencies must be corrected before the next inspection.

Challenge: varying voltage situation

Work is nearing completion at Empower's site in June. At the time of the interview in early June,

only a small part of the worksite is de-energised, and two major commissioning stages are up ahead next week. Tomi Salonen says that the challenging special feature of the site is the voltage situation which changes almost weekly.

"The switching situations have changed several times during the course of the work. The workers are given new instruction whenever the voltage situation changes to make sure that all persons working at the site are aware of the live parts of the substation," Tomi Salonen says.


Empower launched an occupational safety campaign in 2011, and this year's theme is "Only you can make a difference".

"The campaign intends to emphasise that every employee is obliged to report near miss situations and potential occupational safety deficiencies," Tomi Salonen says. "Occupational safety is a matter of honour to us, and our employees are highly motivated to take care of safety."

Stay attentive at all times

The large number of subcontractors brings an additional challenge to Siemens' site. "The more workers there are at the site the more unexpected events can happen. On the other hand, the procedure is always the same regardless of whether there is one worker or ten," Innar Sepp says.

"The situation at the site changes constantly and requires continuous vigilance. There is never a moment where you could just sit back and say that everything is fine now." ■

A photograph of three workers in safety gear (blue hard hats, high-visibility yellow and blue clothing) working on a construction site. One worker in the foreground is wearing a vest with 'ELYEL' written on it. They are surrounded by dirt, rocks, and some greenery. In the background, there are tall structures resembling power line towers. A blue circular graphic is overlaid on the top left of the image, containing text.

Towards the end of 2013, Fingrid will launch a campaign to collect safety observations. We challenge all workers at the worksites to make observations and to report them to Fingrid! There will be prizes for those who report safety observations.



OCCUPATIONAL SAFETY IN STATISTICS

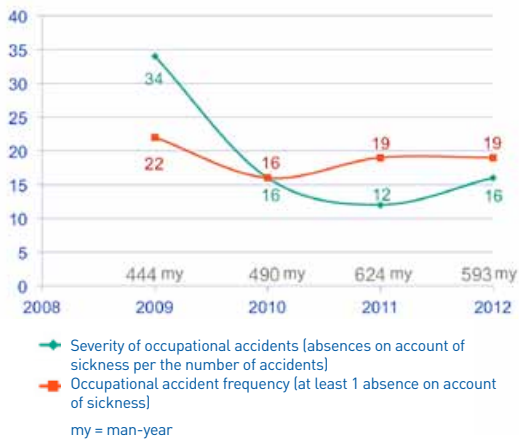
Text by Suvi Lokkinen | Photographs by Valtteri Kantanen

Fingrid has compiled systematic statistics of the occupational accidents of its service providers for several years. The accident and safety risk notifications provide valuable information on the state of the worksites and on the necessary development measures.

Fingrid has outsourced all of its grid construction and maintenance work to competent and carefully selected service providers. Each service provider is responsible for the safety of its site, but Fingrid as the client wants to be centrally involved in directing safety at the worksites towards the objective of zero accidents.

Fingrid's service providers are contractually obliged to report all accidents at the sites to Fingrid. Fingrid systematically reviews the accident notifications and analyses not only the level of occupational safety of the service providers but also what Fingrid can do to prevent similar accidents. The statistics show that, in the long term, the accidents made by Fingrid's service providers have become less serious. →

Trend in the key figures of occupational accidents sustained by service providers



Hoisting device accidents are the most common

Fingrid has focused on occupational safety over the years. Despite this, occupational accident frequency has remained more or less unchanged during the years that were covered by the statistics. There are approximately 20 accidents per million work hours at Fingrid's sites. This is less than the average in the construction industry: according to the annual statistics by the Federation of Accident Insurance Institutions, the average accident frequency in the construction industry in Finland is 60 accidents per million work hours.

Fingrid also reviews the types of accidents that occur at its sites. The most typical injuries at Fingrid's sites are related to the use of hoisting machines. One serious example of such an accident is from Mikkeli in the spring of 2013, when the hoisting machine operator and two persons installing a transmission line sustained injuries when a hoisting machine tipped over.

Other typical accidents in both construction and maintenance work comprise various types of slipping and tripping. Vehicle accidents, falling, and different kinds of electrical accidents are also regrettably typical at Fingrid's sites.

Careful instruction is important

Based on the statistics, there is no specific occupational group or other group which is especially prone



to accidents. The descriptions of the accidents in the accident notifications reveal that accidents happen to both experienced and new professional workers, and roughly as often to Finnish and foreign workers. However, it seems that young people typically under the age of about 30 have been involved in accidents and serious hazards, leading to danger to life, more often than others in recent years. Fingrid has asked its service providers to pay even more attention to high-quality and meticulous instruction concerning the tasks as well as to supervision.

However, some common denominators can be found for the accidents. Factors increasing susceptibility to injuries include carelessness, failing to comply with the instructions, deficiencies in supervision, uncleanliness of the site, poor or insufficient instruction to the duties or site, and unexpected changes in resources such as a new work partner. Moreover, tight schedules and the approaching completion of a project or work stage raise the accident rate. One of the major risk factors is the fact that the voltage situations and site arrangements at Fingrid's sites change frequently. It is, therefore, important that the entire site organisation is always told about the changes.

The accident statistics based on sick days do not provide a fully comprehensive picture of the safety situation of the sites. In 2010 and 2013, there were

fatalities at Fingrid's sites, which are not reflected as sick days in the statistics. Both of these fatalities were electrical accidents and related to the charging voltage. Electrical risks are always present at Fingrid's sites.

Safety observations prevent accidents

One important tool in the prevention of accidents is the so-called safety observations. We hope to receive much more of them than we do currently. Safety observations are small signs that there is room for improvement in the site safety level even before a dangerous situation or accident actually takes place.

The correction of small issues can prevent several accidents because accidents often happen as the sum

to encourage all of our service providers to spend time on completing the accident notifications carefully and to consider what can be learnt from an accident.

On the other hand, there are not as many safety risk notifications as there could be. From time to time it transpires that a safety risk notification was not made because "nothing really happened". However, the safety risk notifications provide equally as much material for safety improvements as the accident notifications. This is why we hope that all worksites will pay particular attention to the drawing up of safety risk notifications.

Based on what has been learnt from accidents and safety risks, Fingrid has, among other things,

Types of safety notifications

Safe situation	Safe situation	Floors and routes are clean and free from obstacles.
Safety risk notification	Safety risk	Cable ties are on the floor in the middle of a walking route.
	Safety observation	A person makes an observation of cable ties on the floor.
	Near miss situation	A person stumbles on cable ties on the floor but maintains his/her balance and does not hurt him or herself.
Accident notification	Occupational accident	A person stumbles due to cable ties that are on the floor. The person trips and hurts his/her knee.

OBSERVE • INFORM • EXAMINE • ACT • LEARN TOGETHER!

of small factors. As an example, cables on walking routes or routes which have not been gritted in the winter could have been prevented from causing tripping or slipping that has resulted in several days of sick leave due to reasons such as bone fractures.


The observations tend to become more infrequent as work at a long-lasting site makes progress, because the eye "gets used to" the site environment. In this case, it is important that especially new people arriving at the site are encouraged to make safety observations and to report them to the main contractor and Fingrid.

Everyone can learn from the accidents of others

Fingrid's service providers report accidents comprehensively and in good co-operation. Now, we want

changed the guidelines concerning the work methods, and the agreement terms for safety. As an example, notifications of tripping and slipping have led to the supplementing of the terms of agreement so that, in the future, there have to be places for crossing the cable channels at intervals of 50 metres.

It is our goal to provide information and best practices between the sites so that all service providers and all sites can reach the optimum and safe work performance. Lessons learnt from an accident at one site can facilitate all of Fingrid's sites in order to avoid accidents. Our goal is to reach zero accidents at all the worksites. We hope that we will all work together to achieve this goal. ■



“The schedules must be such that the work can be performed safely. No compromises can be made with occupational safety; it must override everything else.”

GET HOME IN GOOD HEALTH

Text by Suvi Artti | Photograph by Esa Hiltunen

“Every worker must leave our sites in good health at the end of the day,” is how Project Manager **Antti Linna** sums up Fingrid’s occupational safety goal.

Antti Linna's job description as a project manager was expanded in early February to also cover development duties in occupational safety. The new job description was established because Fingrid wanted to focus even more on the safety of the worksites. "We feel genuine concern for occupational safety, and we endeavour to improve it," Antti Linna says.

Transmission line construction sites are familiar places to Antti Linna: he has worked at Fingrid as project manager since 1997, and his work history covers tasks such as transmission installation as well as route and location planning for transmission lines. He will continue to work as a project manager alongside his new job description.

His new work includes the monitoring of responsibility and occupational safety matters at all of Fingrid's worksites and in major renovation projects, and the harmonisation of the responsibility practices at the sites. Antti Linna reviews the sites at least once a year, and even more frequently if shortcomings are detected in the inspections.

He states that the contractors have received the new task very well. "We have already developed the efforts together with the contractors."

One accident is too many

There was a serious accident at Fingrid's site in Savitaipale in April, when a worker employed by the Polish company Selpol died of electric shock. The accident occurred when inspections and repairs were carried out on a new transmission line. The incident touched Antti Linna personally, because he was the project manager for the Yllikälä–Huutokoski line site in question.

"There were two less severe electrical accidents at the site earlier. We tightened the earthing guidelines after the first incident. The accidents were caused by the charging voltage, which is a

constant, serious danger at our sites."

"Most of our ongoing transmission line projects are about constructing a new line parallel with an existing line or to replace an old line. This means that there are live lines at the site. We have stressed the danger of the charging voltage, increased the requirements for earthing, and given concrete and unambiguous instructions," Antti Linna says.

In May, there was another serious accident along the same transmission line site in Mikkeli, where a hoisting cage truck tipped over when a support leg failed. Three workers were injured in the accident. "Luckily, they all survived. The authorities are investigating the matter and, in this case too, we naturally examine ourselves whether we can further develop our ways of working so that something like this will not happen in the future," Antti Linna says.

It is a coincidence that the accidents occurred at sites along the same transmission line, and the events are not related to each other. How can accidents be prevented in the future?

"The right attitude is the key in occupational safety. No matter how unambiguous our guidelines are and no matter how strict our requirements are, we cannot be present at the sites all the time making sure that they are all followed. The employees themselves must be aware of the risks and work safely at all times."

According to Antti Linna, one risk is that people become numb to the risks that are involved in their work at those sites which go on for years. On the other hand, the pressure that is exerted on the schedule and the transmission outage challenges add to the stress.

"The schedules must be such that the work can be performed safely. No compromises can be made with occupational safety; it must override everything else." ■

GOAL OF THE OCCUPATIONAL SAFETY PROJECT: **ZERO ACCIDENTS**

Text by Suvi Lokkinen

Photograph by Matti Immonen

The development project for occupational safety at Fingrid was launched last year, and the project still continues at full power.

Fingrid's occupational safety project aims at the development of the occupational safety culture among the service providers and Fingrid employees. In 2012, the 16 subprojects under the main project devised new practices which improved occupational safety, enhanced the guidelines, conducted surveys of safe procedures, and developed safety in co-operation with both service providers and other stakeholders.

Good experiences from MVR measurements

One of the most important new practices is the weekly MVR cleanliness and safety measurement that is performed at the sites (MVR is derived from the Finnish words for earthwork and hydraulic engineering). The MVR measurements were piloted and developed at the Anttila substation site in 2012 to better suit Fingrid's site environment. The measurements were launched into standard use at substation sites in 2013. The MVR measurements systematically measure the success rate of occupational safety at the worksite. The result of each site survey

is a clear numerical value that describes the positive observations made during the survey in relation to the total number of observations. The shortcomings detected are also recorded during each MVR measurement, and the parties responsible for correcting them are named.

However, the most significant thing in the MVR procedure is not the measurement percentage, but rather the improvement of safety at work. Fingrid does not subject its sites to competitive bidding in terms of the MVR measurement results, nor are there penalties for shortcomings. The most important thing is that the measurements are carried out thoroughly, that the reporting is honest, and that all deficiencies are quickly corrected.

Fingrid's sites have been inspected on several occasions and for different purposes in the past on a weekly basis, both by the service providers and Fingrid's own employees. The piloting of the MVR procedure indicated that a uniform practice provides several advantages for the enhancement of occupational safety. Each observation is a step towards a safer site and offers the opportunity to develop the safety of



not only the particular site but also all of Fingrid's sites. The observations made during the MVR measurements are an important part of the improvement of occupational safety. The MVR measurements can be further developed as more experience is accumulated, and the number of issues to be monitored can be increased, if necessary. In the introduction of new measures, it is important that the service providers conducting the measurements give Fingrid feedback on the functioning of the indicator and present development ideas to improve the indicator.

Sanctions received well

Within the occupational safety project, it was also decided to introduce sanctions for the non-use of personal protective equipment from the beginning of 2012. The sanctions were discussed with the representatives of all the service providers, and none of the companies considered the sanctions as a negative introduction. The sanctions were already a familiar issue to many because a number of enterprises in Finland and abroad impose fines (in euro) for corresponding safety breaches.

On the other hand, occupational safety incentives and the amount of the sanctions (in euro) divided the opinions. While some service providers thought that incentives are a good idea, others considered that attending to occupational safety is part of the normal performance, for which there should be no separate reward. However, it was decided that the discussion on the incentives and their format will continue. It was also decided that a pilot study of the incentives will be carried out at one site. Fingrid has also decided to launch incentives related to safety observations in late 2013. These will be piloted in all the projects.

Focus on falling protection

Fingrid has conducted long-term efforts to promote safety at work, even before the establishment of the current occupational safety project. Among other things, in 2005, Fingrid started a falling protection project, as a result of which a double safety rope system was introduced in work carried out on old supports. In addition, safety ladders have been installed on all new supports since 2006. Between →

2008 and 2012, a total of almost 84,000 metres of safety ladders have been installed. The total installation cost was approx. 4 million euro.

Fingrid continues to invest in falling protection in 2013, when new falling guards will be installed on a total of eight transformers. Development work has also been carried out in order to achieve increasingly safe work methods. The opening of disconnectors by means of compressed air, which is regarded as dangerous, was ended in 2011. Fingrid is currently examining issues such as ways to reduce the risks related to work in the vicinity of parallel lines.

Positive co-operation

Fingrid considers it important to develop safety at work in co-operation with the service providers. This is why Fingrid has focused on occupational safety dialogue with the service providers, both at the site and at the executive levels. At Fingrid's initiative, safety issues are the top agenda in each site meeting. The preconditions of the potential supplier to take care of the safety of the site are discussed as early as in the contract negotiations.

Every other year, Fingrid invites the service providers to a theme day in asset management, with safety issues being of central importance. An occupational safety forum that is intended for the management of the service providers will assemble for the first time in September 2013. In October, Fingrid will arrange the traditional service providers' occupational safety seminar.

In all the discussions and collaborations with the service providers, it can be seen that the occupational safety attitudes have moved into a positive direction. An indifferent attitude towards safety issues is very rare, and taking care of safety at work is perceived as a self-evident part of high-quality work. What is particularly positive is the fact that failures related to occupational safety are also brought up more openly than earlier. After all, genuine improvements require that the deficiencies to be corrected are identified. ■

VITAL ISSUES

Text by Suvi Lokkinen | Photograph by Esa Hiltunen

The use of personal protective equipment is an essential part of safe working. The most important piece of equipment is the helmet, which serves as a safety device. Its use is mandatory at Fingrid's sites for both workers and visitors.

The use of personal protective equipment is an essential part of safe working. Everyone must wear a helmet at Fingrid's sites, and for good reason: the head is one of our most precious body parts. In 2012, the helmet saved the life of at least one person working at one of Fingrid's sites when a concrete pump suddenly hit the person's helmet and broke it in half. In addition to the helmet, you should also

The erection of supports was in progress at Fingrid's transmission line site in Kajaani in June.



remember to use the other protective equipment as required in each particular case.

Aspects of head protection

- HEAD as a whole
- EYES - vision
- EARS - hearing
- NOSE - smell, breathing
- MOUTH - taste, breathing

Eye injuries can be caused, for example, by exposure to chemicals or vapours, sudden and hard atmospheric pressure directed at the eye, a foreign object, or exposure to ultraviolet or laser light. Several of Fingrid's sites contain work stages where eye protection should be used because of dust or particles ejected in the air, for example. Even though the use of eye protection would not be mandatory at the site, the use of safety goggles must always be considered individually in each case.

In 2012, Fingrid imposed sanctions for neglecting the use of personal protective equipment.

Shortcomings in the use of helmet, high-visibility clothing, or safety footwear led to a written complaint to the main contractor and a fine of 250 euro in all new construction projects and in maintenance management. Moreover, the non-conforming person is removed from the worksite for the rest of the day or given a warning. The need for other protective equipment must always be analysed specifically for each job and work stage. It is the duty of everyone within the worksite to intervene in unsafe working and to tell the worker about the risk to which the worker may be exposed, and about the possibility to be protected against the risk.

Fingrid has decided to raise the sanction for the lack of using personal protective equipment from 250 euro to 1,000 euro. The new sanction amount applies to all new agreements from 1 January 2014.

Ear protection requires special attention to be paid not only in loud environments but also when working in confined spaces, among other things. Ears and earrings may entangle in structures or parts, resulting in ruptures or wounds. Hearing damage is possible when working in loud environments or in the vicinity of loud machinery. Other risk factors, such as various music players and mobile phones also burden hearing if their sound level approaches the risk level, especially when using earphones. Approximately 15 per cent of all Finns suffer from noise induced hearing loss. Tinnitus, or ringing in the ears, is a typical nuisance following exposure to noise.

The basic principle in combating noise pollution is that if you cannot hear another person talking at a distance of one metre due to background noise, hearing must be protected. The table below shows the time within which repeated exposure to a variety of decibels can result in hearing loss.

- 85 dB: 8 h
- 88 dB: 4 h
- 91 dB: 2 h
- 94 dB: 1 h
- 100 dB: 15 min

Source: www.kuulosuoja.fi

Nose injuries typically include different types of nicks, cuts, and the entanglement of jewellery. Nose bleeding can be a sign of irritation and contaminated breathing air, or other health problems, such as high blood pressure.

The nose and mouth are key parts of the human respiratory system. Through them, impurities such as microbes and dust particles also enter the body. The accumulation of particles in the different parts of the lungs depends on the aerodynamic diameter of the particles, dimensions of the airways, and individual aspects of respiration (e.g. flow rate, frequency, and change rate). Our individual defence mechanisms also make a difference. The smaller the particles are the more likely they are to reach deeper into the respiratory tract (Source: www.vtt.fi). ■

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