

FINGRID'S OCCUPATIONAL SAFETY PUBLICATION FOR SERVICE PROVIDERS | 2015

# SAFETY ON THE LINES



**THE MOST  
SIGNIFICANT  
DANGER FACTORS**  
ON WORKSITES HAVE  
BEEN IDENTIFIED

p.12

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## SAFETY ON THE LINES

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Fingrid's occupational safety publication 2015

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# Occupational safety is long-term work

Occupational safety level improves when we invest time and effort into safety. Occupational safety is a matter of cooperation, so we all have to commit to developing and maintaining it. The trend in the development of occupational safety in 2014 was good: our service providers' accident frequency (number of incidents per million work hours) fell to 9 from 13 in the previous year. Service providers carried out a total of 533 man-years on Fingrid's sites and during that time 8 incidents resulting in absence took place. Not a single one was serious, which is defined as leading to an absence of over 30 days of sick leave. Thank you to all our service providers for your good work and commitment to occupational safety in 2014.

Unfortunately, in 2015 the positive development in occupational safety has not continued in the way we'd hoped. By August, service providers had experienced 12 workplace incidents which led to absence, which is already more than all of last year's incidents combined. In addition, a Fingrid specialist was involved in a serious electrical accident in May. Causes of the serious and dangerous situations faced by service providers included demolition work and unsafe working methods while installing and dismantling additional earthing.

We all must continue our long-term efforts to ensure that occupational safety gets back on track in a positive direction. It is important to us that everyone returns home safe and sound from Fingrid's sites at the end of the working day. Thanks to our occupational safety development project, we are continuing to strive for occupational safety together with our service providers. In this magazine, we present our site safety supervisors, check in with the mobile reporting project to see how it has progressed, and look at Fingrid's online training.

Let's all pay attention to how we work and intervene in any unsafe action. By changing our own safety behaviour we can change the entire safety culture on Fingrid's worksites. Safety starts with every one of us and our attitude.

**Karri Koskinen,**  
Expert, safety  
Fingrid Oyj





# Safety supervisors as promoters of occupational safety

Fingrid has set its worksites the target of zero accidents. One step towards safer worksites is a new practice of hiring a separate safety supervisor to be responsible for safety supervision and orientation on large transmission line worksites.

Text: Meri Viikari | Photograph: Karri Koskinen

The first safety supervisor started work in late 2013 on the 400 kilovolt transmission line worksite between Hikiä and Forssa, where the Rautarouva line from the 1920s is being renewed. There are currently safety supervisors on four of Fingrid's transmission line worksites.

Funded by Fingrid but on service providers' payrolls, safety supervisors are occupational safety specialists whose task it is to promote and monitor the realisation of occupational safety in transmission line projects. The supervisor encourages workers on site to pay attention to safety issues and to make hazard observations. In this way she or he promotes safe working methods in everyday work. The safety supervisor also observes and records any deficiencies in safety on the site and assigns responsibilities for corrective procedures. The supervisor makes sure that workers on site have the sufficient skills and competence required to carry out the work. He or she organises the necessary competence tests and keeps a record of both contractor and subcontractor competences.

The safety supervisor also investigates accidents and near-miss situations. In such situations, investigative work takes priority over other work tasks.

In serious incidents, a Fingrid occupational safety specialist carries out an investigation in cooperation with the safety supervisor and service provider.

## A visible reminder of occupational safety

When **Seppo Maksimainen** began work as a safety supervisor in December 2014 at contractor Eltel's Siikajoki-Pyhänselkä transmission line worksite, the work and job description of a safety supervisor were still new and mysterious. Early on whenever he approached a work group, he would cause a hustle and bustle as the workers ran to their vehicles to fetch missing safety gear.

### A SAFETY SUPERVISOR'S JOB DESCRIPTION

- Safety orientation
- MVR measurements
- Worksite safety monitoring
- Worksite competence monitoring
- Investigation of incidents
- Holding tool box talks with personnel
- Safety reporting

**Heikki Vinni**, who is safety supervisor at contractor Empower's Raasakka-Maalismaa transmission line worksite, has also noticed that there is a tendency to cut corners in safety matters or to blame equipment or tools. "A change in the way we think is key," says Vinni, and points out that employees are obligated to demand appropriate tools and to refrain from carrying out work without proper safety gear.

The safety supervisor is best able to influence worksite safety by being present and engaging in discussion with workers. "The supervisor has the opportunity to direct employees' attention to safe working methods," says **Jaakko Hämäläinen**, safety supervisor at contractor SAG's Hikiä-Forsassa transmission line worksite. Heikki Vinni agrees that safety supervisors should be visible and easy to approach. On the Raasakka-Maalismaa site, employees have given plenty of positive feedback on how approachable Vinni is. The workers find it very easy to ask Vinni things that would otherwise probably be left unasked.

Seppo Maksimainen believes that the regular inspections that are part of a safety supervisor's job description have increased workers' awareness of

safety matters and improved worksite safety, and even the quality of work. "When it became compulsory to wear a hard hat, there was always someone who stood out. But nowadays you just feel naked if you aren't wearing a hard hat," says Maksimainen. He predicts that the same will happen regarding the protective eyewear and chinstraps which were made compulsory on Fingrid's worksites last spring. Jaakko Hämäläinen believes that simply being visible on-site every day sends a message to workers that safety is important.

Safety supervisors also face challenges in their work. Tours of sites and discussion with workers is an essential part of their work, but multinational worksites can pose some challenges with regard to communication. Both Hämäläinen and Maksimainen admit that the lack of a common language sometimes makes it difficult to interact with employees. "Personal contact and daily discussions are reduced if we need to rely on an interpreter," says Maksimainen.

And what happens nowadays when Maksimainen arrives on site? No-one rushes off anymore, since safety matters have become a part of the daily routine. ■

Safety supervisors in Pohjois-Suomen Turvapuisto. Pictured from left to right: Olli Airaksinen (Pohjois-Suomen Turvapuisto), Antti Linna (Fingrid), Jaakko Hämäläinen (SAG), Juhani Ahonen (Fingrid), Pentti Talala (Eltel Networks), Seppo Maksimainen (Eltel Networks) and Heikki Vinni (Empower).





# LEARNING FROM MISTAKES

A hand is shown writing the word 'MISTAKES' in white chalk on a dark grey chalkboard. The hand is positioned on the right side of the page, with the index finger pointing towards the end of the word. The word 'LEARNING FROM' is written in yellow above 'MISTAKES'.

## Safe demolition work begins with advance planning

Careful planning is the basis of safe demolition work.

Text: Jouko Loikala | Photograph: iStockphoto

**M**any different kinds of demolition work are carried out on Fingrid's new construction and maintenance sites. On transmission line sites, the most common kind is the disassembly and removal of lines, towers and foundations and their equipment, while at substations demolition work relates to the demolition of equipment and buildings. All worksites require that demolition work is planned carefully in advance. Before demolition work begins, a risk assessment must be carried out on the work to be performed. The Government Decree on the Safety of Construction Work (205/2009) states that demolition work poses particular danger and must be planned as part of safety planning.

Unfortunately, this year several serious dangerous situations occurred on Fingrid's construction

sites in connection with demolition work, and one accident led to absence from work.

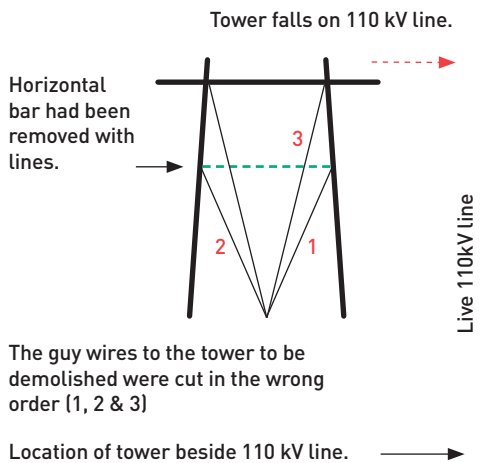
**In March 2015, an employee was injured** when removing protective scaffolding from an intersection on a transmission line worksite. The employee was working on the scaffolding's post, when it fell and the employee fell from a height of approximately 3 metres. The work group had carried out several different tasks throughout the day before demolition work began in the afternoon. A crane took hold of the scaffolding's horizontal support, the workgroup's foreman climbed onto the scaffolding's post and the person who was injured climbed onto another post. The first horizontal support and post were successfully taken down. After this, another horizontal support was attached to the crane and the foreman moved to a third post while the injured party remained on the second post.

He detached the chain connecting the horizontal support to the post he was on. Because of this, the tower he was on began to tilt. Other members of the workgroup noticed this and tried to warn him by shouting. It was however too late to climb down, and the employee fell with the post.

**Rapid changes in the working environment** and insufficient planning can be deemed the cause of the incident. The scaffolding had been erected in snow approximately two weeks before the incident. The majority of the snow had since melted and the posts of the scaffolding were at an angle. The work in question had been deemed basic work, for which reason there was no separate plan for the demolition. The workers did not notice that the scaffolding's post was at an angle, even though they visually inspected the scaffolding before beginning work.

**In March 2015, two near-miss situations occurred** in connection with the demolition of transmission line towers. In both cases the towers were demolished by means of tipping them over. In the first incident, a workgroup was used who had not demolished any towers in the project in question. The workgroup was given instructions on how to carry out the demolition work and work began. One member of the workgroup cut the guy wires to the tower which was to be demolished in an order which contradicted with guidelines, whereupon the

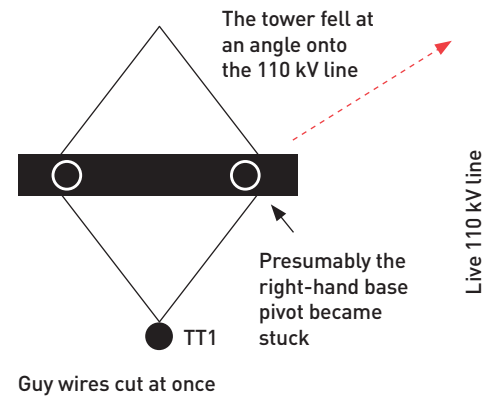
#### INCIDENT 1



tower spun around and fell onto the guy wires of the tower beside it, which was in use. The tower's pivots and guy wire were damaged in the incident.

#### INCIDENT 2

Tower to be demolished as seen from above



**The cause of both incidents** was deemed to be that there were no measures in place to ensure that towers for demolition do not fall onto a live line. The risk caused by the neighbouring live line was identified and attention was paid to it in orientation material. However, insufficient attention was paid to the live line in work instructions and the working methods used. The instructions did not outline how to ensure the direction in which the tower would fall, such as by using side supports. According to the instructions, existing towers were to be taken down using a crane if necessary, but cranes were not used in either incident.

**The incidents showed** that all demolition work should be planned carefully and that plans should take into account the results of risk assessments. Plans should be checked before demolition work begins in order for the work to be carried out safely.

There are many occupational safety risks relating to demolition work which do not occur in new construction. These include, for example, old and partially demolished structures, as well as hazardous substances. During planning, special attention must be paid to occupational safety, the condition →



## DEMOLITION WORK CHECKLIST

**Before beginning demolition work, first ensure the following:**

- a demolition plan has been drawn up appropriately and has been inspected to make sure it is feasible
- the condition of structures has been ensured before climbing on them
- all workgroup members have been provided with orientation concerning the site, the demolition plan, working methods and work-related risks
- the necessary supports, protection and traffic arrangements have been put into place.

**As demolition work progresses, make sure that**

- work is carried out in accordance with plans
- unauthorised persons are prevented from accessing the demolition area.

Also take other workgroups into consideration, for example when demolishing lines.

of existing structures should be investigated and the order of demolition should be planned so that the work does not cause a danger of collapse. Tidiness is also part of safe demolition work, so the processing and removal of waste should be taken into account during planning.

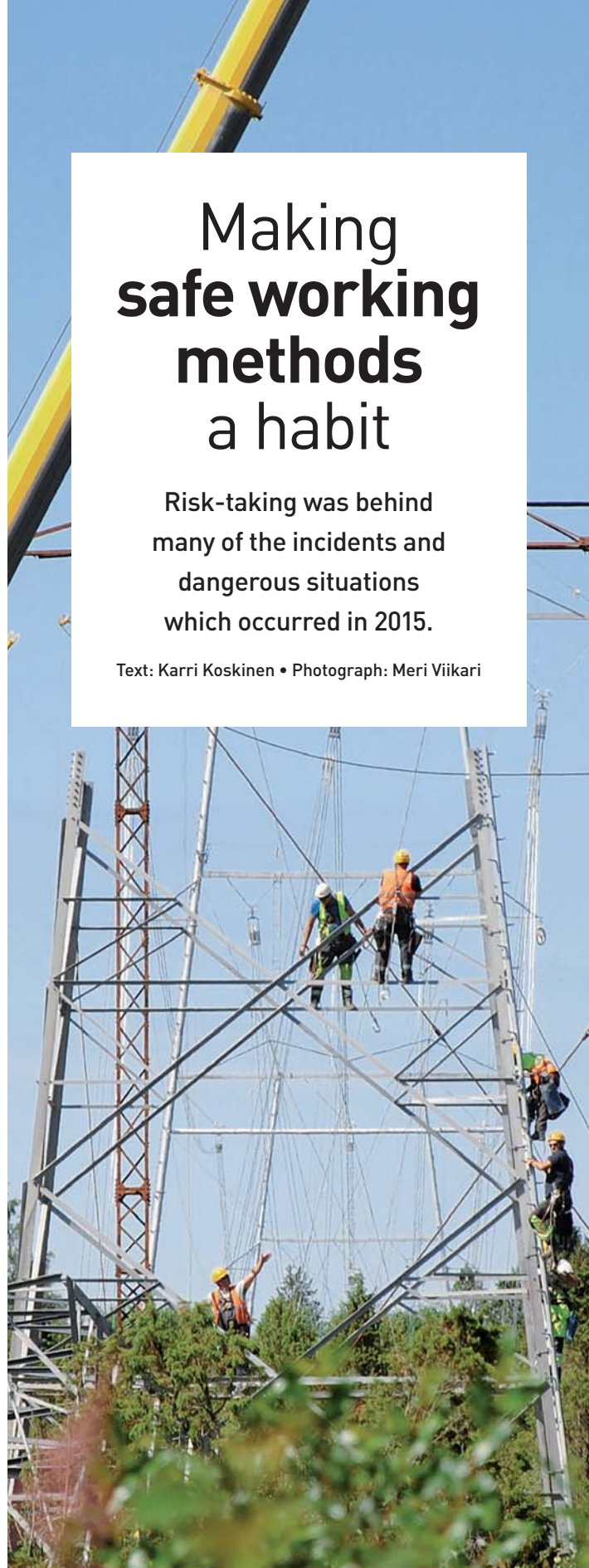
A tight schedule on site can pile on the pressure to get work done quickly. But even when pushed for time, it is important to remember: if work cannot be carried out in accordance with plans, it must be called off and re-planned. 📌




# Making safe working methods a habit

Risk-taking was behind many of the incidents and dangerous situations which occurred in 2015.

Text: Karri Koskinen • Photograph: Meri Viikari







**T**wo serious dangerous situations this year were related to earthing practices. In these cases, employees consciously took a major risk by installing or detaching additional earthing by hand without using an earthing stick. The installation or detachment of earthing by hand can endanger the worker's life and is therefore absolutely prohibited.

**At the start of the year**, an employee put himself in danger by working from the forks of a telescopic handler at a height of approximately 3 metres. Fall protection was attached to the telescopic handler's forks, but it would not have been of any benefit if the boom had suddenly dropped or fallen. In addition, there was also a risk of being crushed. This method of working is forbidden not least because the telescopic handler is not meant for lifting people. In addition to the employee who worked on top of the forks, the entire workgroup acted wrongly; the driver of the telescopic handler should not have lifted the worker, and other members of the workgroup should have intervened in the unsafe action and called off the work.

**Working at height** has caused danger on Fingrid's worksites, and several incidents have happened on towers because of slipping. In one incident, an employee slipped while moving a ladder along the cross arm of a 400 kilovolt tower and caught his finger between the ladder and cross arm, breaking his finger. The reason for the incident was unsafe action by the employee. According to the workgroup, the ladder is normally moved by letting it down on a rope and then lifting it up again at the right spot. The employee decided, however, to move the ladder by hand to a new place on the cross arm. He moved the ladder behind his back, which meant he was unable to use his hands for support during the move. He was using fall protection, so luckily there was no potential for a more severe incident.

**Machines and rotating axles** have also caused accidents on Fingrid's sites in 2015. These acci-

dents could have been avoided by thinking about how to carry out the work safely in advance. One incident took place during substation maintenance when a mechanic was maintaining a disconnector and carrying out post-maintenance reconnections. During reconnection, one of the phases did not close and the mechanic took hold of one of the motor's rotating axles to fix the fault. Part of the brake in the lower part of the axle then bruised the mechanic's finger.

In another accident, an employee put his hand too close to a rotating drill bit. His glove became caught on the bit and his finger was injured. Moving axles and bits should be protected so that there is no danger of accident. Report any deficiencies in protection for machines or equipment immediately to site management. It is each and every person's responsibility to report dangers and deficiencies.

### **Risk-taking is never worth it**

Several of the accidents and dangerous situations that took place in 2015 could have been prevented by paying attention to safe working methods. Reasons given for risk-taking include being in a rush and getting the work done more easily. People think nothing will happen to them because nothing has happened before. Risks are sometimes taken out of ignorance, or there could be an atmosphere of nonchalance in the community towards unsafe working methods and a tendency not to intervene. Compromises at the expense of occupational safety are never acceptable.

In order to achieve our zero accidents target, everyone must take responsibility for both their own safety and the safety of others. It is not enough for the working environment to be in order; we all have to think about how we work. Danger factors should be identified and all employees should receive orientation in safe working methods. Let's make Fingrid's worksites safe – together! **■**

# T3 reporting – a mobile tool for monitoring occupational safety

In late 2013, Fingrid launched a study into the utilisation of mobile devices and applications on worksites. The T3 reporting system was created in cooperation with the Finnish IT industry company NordSafety Oy and is now in use on almost all of Fingrid's worksites.

Text: Mikko Ahonen | Photographs: Matti Immonen and Videolle Productions



The T3 system's development group includes from left to right: Fredrik Löfberg (NordSafety), Karri Koskinen (Fingrid), Mikko Ahonen (Fingrid), Timo Kronlöf (NordSafety), Taneli Ruusunen (Fingrid) and Ville Toivanen (Fingrid, not in the picture).

The joint R&D project between Fingrid and NordSafety originally aimed at developing a tool for the weekly measurement of occupational safety levels and for electronic notifications concerning dangerous situations and accidents. During the first phase of the project, an electronic site journal and applications for managerial reviews and worksite document management were also added. Testing of the applications began in spring 2014 in the form of pilots on a few of Fingrid's substation and transmission line worksites. Shortly after the pilot was introduced, positive feedback began to come in on the user-friendliness of the applications. Feedback showed users were pleased with how clear and modern the applications had made reporting.



### T3 REPORTING

- A public product owned by NordSafety Oy
- Fingrid Oyj has been actively involved in development work
- A mobile tool for worksite HSEQ (Health, Safety, Environment, Quality) monitoring
- Land and water construction measurements, worksite journals, dangerous situations and notices of accidents along with investigative processes, supervisory forms, work hour monitoring, safety index monitoring, etc.
- Can be used on all phones, tablets and desktop computers
- Works on all operating systems
- Can also be used in offline mode without an internet connection

Encouraged by good user experiences, Fingrid made the decision in late 2014 to implement the T3 reporting system more extensively and to deploy it to all Fingrid's investment sites as well as take it into use for condition management. The decision was made to develop more components for the system with which to further improve worksite reporting and occupational safety. The second development phase included the development of occupational safety reporting, a process for reporting accidents and dangerous situations, an application to record the number of hours worked and forms for local supervision by the client.

### More features on the way

Over the past year, the system has become a tool for all of Fingrid's investment worksites and is gradually moving to condition management sites. The number of sites and users the system is used on has grown in leaps and bounds. On Fingrid's worksites, the number of users is around three hundred and the system has already generated approximately 4000 forms. The T3 reporting system is also used by other companies in the energy and construction industries.

In summer 2015, the decision was made to implement a third development phase for the system to make it even more versatile and user-friendly. Upcoming features include a development version for site document management, pdf mass storage, dynamic forms, new form templates for local supervision and an application for giving feedback. In early 2016, Fingrid's worksites will be using an even more versatile reporting application.

Worksite safety is especially important to Fingrid, as is a high level of quality. Work is constantly under way to improve and maintain both safety and quality. The world is changing and developing at high speed, and the need for reporting is ever increasing. The development of the T3 reporting system in cooperation with NordSafety has been one example of how modern tools can improve occupational safety monitoring and the level of occupational safety itself, as well as improve quality monitoring. As a result of the mobile tools, worksite reporting has been made much easier, saving time and improving productivity. ■



# Identify risks, **avoid danger**

On Fingrid's maintenance and investment worksites, different kinds of work are carried out in a continuously changing working environment, and many are considered to pose particular danger.

Text: Karri Koskinen • Photographs: Meri Viikari

**W**ork that poses particular danger must be planned carefully as part of safety planning. Employees must have the sufficient competence and professional skills, and they must also be physically and psychologically suited to the work.

In 2014 we investigated the most significant danger factors on transmission lines and substations. Danger factors were identified in Fingrid's internal occupational safety card training and were examined together with persons responsible for investments and condition management. As a result of the investigation, we compiled a list of nine significant danger factors or dangerous tasks:



## 1 GENERAL ORDER ON SITE

A large number of incidents on Fingrid's worksites involve slipping or tripping. We can reduce the risk of accidents by following the plan for the use of the construction site area and by taking care of site cleanliness.

## 2 COMMUNICATION AND RESPONSIBILITIES ON A SHARED WORKSITE

On shared sites, independent workers and employees of several employers all work on the same site either concurrently or consecutively. This can cause dangerous situations if responsibilities are not clear, or if communication is not sufficient. That's why it's important for everyone to be aware of their obligations and for there to be one party on site who is responsible for matching and coordinating work. Primarily, the main contractor is respon-

sible for general safety, cleanliness and order on the worksite, as well as for coordinating work.

## 3 CONSTRUCTION AND WORKING ALONGSIDE LIVE LINES AND IN THE VICINITY OF LIVE COMPONENTS

A large number of serious electricity-related accidents and dangerous situations relate to induced voltage. This danger factor occurs when work must be carried out alongside live lines. The background to a dangerous situation could involve failure to identify a live induced voltage danger, or conscious risk-taking. It is of the utmost importance that all workers on Fingrid's worksites are aware of the danger factors involved when working alongside live lines and in the vicinity of live components. Everyone should also be aware of how to avoid these dangers. →



## 4 EXCAVATIONS

Excavations are carried out almost daily on Fingrid's worksites all over Finland, and the soil and conditions can vary quite dramatically. For this reason, it is important to plan all excavations and to inspect the suitability of plans on the site before work begins. No serious excavation accidents have taken place on Fingrid's worksites. Nevertheless, excavations are one of the significant risks on Fingrid's worksites, since the consequences of collapse are often serious.

## 5 LIFTING

Challenging lifting work is carried out on Fingrid's worksites almost daily and in extremely demanding conditions – loads are heavy and the load-bearing capacity of the ground varies from site to site. Several serious and dangerous lifting-related situations have occurred in recent years. In 2013, three workers were injured, two seriously, when a people lifter fell. It is of critical importance to pay special attention to safety when carrying out lifting work.

## 6 WORKING AT HEIGHT

Many occupational safety risks relate to working at height, such as the risk of falling, the risk of items or equipment falling, the risk of slipping and the risk of injury or illness in a location which makes rescue difficult. For this reason, it is important that all workers who work at height are aware of the work-related risks, are prepared to avoid them, are physically and psychologically suited to the work and are able to rescue an injured person at height using the correct tools.

## 7 DEMOLITION AND DISASSEMBLY

Many occupational safety risks relate to demolition and disassembly and depend on the site. These include, for example, chemical risks, the risk that parts or components will fall or collapse, and risks relating to heavy machinery. In recent years, several demolition-related accidents and serious dangerous situations have occurred on Fingrid's worksites. For this reason, it is important

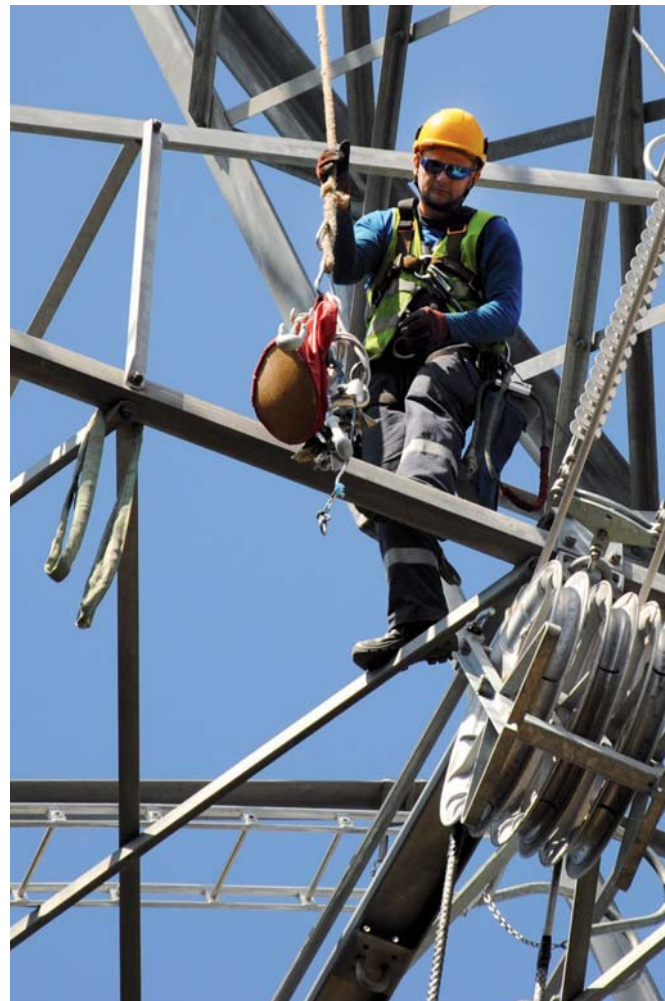
to be aware of the risks associated with demolition work, to carefully plan demolition work and then to act in accordance with those plans.

## 8 TRAFFIC AND WORK ROADS

Traffic is one significant danger factor on Fingrid's worksites and when travelling to the sites. People who work on Fingrid's sites travel quite a lot, which increases the risk of danger. It is important to travel only when well-rested, using equipment which is in a good condition, and to maintain a safety-conscious attitude when doing so.

## 9 WORK DURING TRANSMISSION OUTAGES

Electricity always poses a special risk in electrical industry work. The risk can be reduced through good advance planning of transmission outages and work, and by complying with plans and common rules. **■**






# Learn more about occupational safety at **Fingrid's online school**

Fingrid is preparing an online occupational safety school for workers on Fingrid's worksites. The study package is expected to be taken into use in early 2016.

Text: Karri Koskinen • Photograph: iStockphoto

**T**he online school consists of three basic modules and eight advanced modules. The basic modules include information about Fingrid's contract terms relating to safety, general safety rules and legislation, and working with transmission lines and at substations. The advanced modules, which are for mobile use, provide the student with more detailed information on the most significant danger factors on Fingrid's worksites and good practice to avoid danger.

The aim is for all workers and supervisors to complete the basic modules before work begins in future projects. In projects which are already under way, the studies are to be completed as soon as possible after the online school is opened. The advanced modules are to be completed in a staggered manner according to the work to be carried out on Fingrid's sites; for example, the lifting module is to be completed before lifting work begins.

Fingrid is implementing the online school in cooperation with MPS Prewrite Oy. 



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