

Review of TUKES in 2002

The Safety Technology Authority (TUKES) is a national agency and developer of the technical safety and reliability in Finland. Our activities extend to *chemical and process safety, pressure equipment safety, electrical safety and rescue service equipment* as well as to *measuring instruments, articles made of precious metals, and CE-marked construction products*.

Surveillance activities

Plant and installations surveillance

The safety of **chemical and liquid gas plants, explosives factories and warehouses, and mines** is generally quite good. TUKES seeks to cut down the number of accidents and to reduce their seriousness in the process industry in particular. In the targets inspected, attention has been paid to safety management systems and policies particularly after the legislation reform of 1999. Some progress has been made, though companies still have much to do in adopting the necessary procedures.

The safety of **pressure equipment** is on a high level, and serious accidents seldom occur. TUKES made on-site inspections in boiler plants, refrigerating plants and sites where liquid gas (LPG) is used. No serious safety defects were found during the visits. Businesses still have room for improvement as regards periodic inspections of pressure equipment. If periodic inspections had been neglected, maintenance had usually been omitted as well. The new follow-up and condition monitoring procedures specified in statutes for the use of pressure equipment have not been adopted widely so far.

The safety of the transfer, distribution and use of **natural gas** has remained good.

The safety of **electrical installations** is generally also good. Shortcomings in servicing and maintenance programmes or corresponding instructions are still far too common, though the situation with the adoption of periodic inspections of electrical equipment has improved from year to year. Acts of negligence have decreased partly thanks to the efforts of the rescue service authorities, who have paid special attention to the issue in fire inspections. However, there are big variations between the municipalities; e.g. 96 % of the inspections were carried out in Kuopio, while only 59 % in Vaasa.



Most electrical contractors provide high-quality work that meets the requirements set, but there still are some single problematic cases. Unauthorised contracting has not become more common, as it was less than 1 % of the some 450 subscribers that were investigated. Unauthorised repair of electrical appliances had to be prohibited in 26 cases of the some 600 entrepreneurs investigated.

Work began in 2002 on drawing up a register of stores selling **refrigeration equipment** and of persons in charge of them. The registration is based on a Government decree on the servicing of equipment containing certain fluorohydrocarbons and substances that reduce the ozone layer, and on the qualification requirements for those engaged in such servicing and in waste disposal.

No serious shortcomings were observed in on-site inspections in stores selling **portable fire-extinguishers**, in **servicing and installation businesses**, and in **inspection bodies**. As to inspection bodies, remarks were made with regard to some minor faults such as the content of the inspection reports and the conditions of tools.

Product surveillance

According to test results, the safety of **electrical products** has decreased slightly as compared with last year, even though there are still very few dangerous products on the market. In 2002, TUKES had 748 product types tested (a total of 1,024 tests in 2001). There were serious safety defects in 45 product types, equalling 6 % of all the tested products (4 % in 2001). Safety defects were common in computer power sources, amplifiers of computer loudspeakers and electrical candle sets.

The **energy labelling** of one refrigeration device and three tumbler driers was inspected. All the equipment tested met the relevant requirements. Energy markings in stores were better displayed than before. Retailers are beginning to show more interest in the labelling now that they have found it to increase sales.

The operating security of **fireworks** has still slightly improved, and the proportion of products rejected in the tests decreased to 13 % in 2002. The reasons for rejections were the product's dangerous functioning and/or non-conformity with the relevant approval documents. No significant shortcomings were found in firework sales before the New Year's Eve. Sales outlets were well organised and only approved products were on sale. Fireworks caused less eye injuries than they did in the previous years.

As to **transportation tanks and packages of dangerous goods**, the surveillance by TUKES, inspection bodies and vehicle inspection covers well the products manufactured in or imported to Finland. Thanks to the multistage surveillance procedure, defective products seldom enter the market. As for **gas equipment**, no deviations from the statutory requirements were found in our surveillance. On the **quarrying explosives** market, two non-inspected, unapproved products were found. In the **chemical tanks** area, a few improper stationary tanks for flammable liquids were discovered. **Aerosol dispensers** conformed quite well to the requirements.

The transition period for the EU Directive on **pressure equipment** terminated on 29 May 2002. However, not all companies have made the changes required by the new national statutes. No systematic market surveillance was started during the year. Most of the **simple pressure vessels** inspected were in line with the Directive's requirements, and no considerable shortcomings were found in documents or markings.

As to **rescue service equipment**, there were non-conforming products in all the sites inspected. The shortcomings and defects, however, usually related with labelling and written instructions, and specific functional properties. A sales ban was issued on one portable fire extinguisher.

Only minor changes were observed in the conformity of **measuring instruments**. Many restaurants still use alcohol dispensers that do not meet the relevant statutes, and serve beer and cider using unverified instruments. There were still many defects in lubrication oil meters: regular verifications were often neglected and many unsuitable meters were in use. Despite the positive trends observed



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in the market surveillance under the EU Weighing Instruments Directive, there are still major shortcomings in the European Economic Area. Non-conforming products have repeatedly been found on the Finnish market.

The surveillance of **articles of precious metals** in 2002 mainly involved articles that do not carry a hallmark. The number of remarks decreased – they were only given to 35 % of the businesses visited (55 % in 2001). In numerical terms, the most serious shortcomings involved the marks. Furthermore, some of the products sold as articles of precious metals were made of non-precious metals.

Non-conforming **CE-marked construction products** were not found in our surveillance.



Accidents in 2002

A total of 339 accidents occurred in TUKES' regions in 2002 (situation end-March 2002). At least 9 of these resulted in death; three of them were explosions, three electrical accidents two LPG accidents and one elevator accident.

There were 39 accidents in the process industry in 2002, which is about the same as in the previous five years. The most serious accident was the explosion that occurred in an explosives plant in which one person

was killed. Accidents of this kind have not occurred in Finland for decades.

The number of electrical accidents remained small as in the previous years. Death was caused by three of the accidents. Two of these resulted from the victim being too close to an exposed live overhead powerline and one was caused by a home-made electrical appliance. There was again one elevator accident in 2002 in which the passenger was wedged to death.

Table 1. Accidents reported to TUKES in 1998 – 2002.

Accident category	1998	1999	2000	2001	2002
Dangerous chemicals, monitored by TUKES	40	30	35	32	33
Dangerous chemicals, monitored by local authorities	28	26	32	113*	120*
LPG	6	16	9	6	12
Explosives	6	5	4	3	4
Fireworks, home-made bombs	10	15	62	31	42
Natural gas	-	-	-	-	-
Mines ¹⁾	54	63	85	59	46
Other mine accidents	1	-	2	-	2
Pressure equipment	9	16	12	12	18
Aerosol dispensers	7	9	1	-	-
Electrical equipment and installations	64	42	49	44	52
Elevators	8	9	9	10	4
Transportation of dangerous goods, transportable pressure equipment	8	3	2	12	6
Total	241	234	302	322	339

*) The numbers registered in 2001–2002 are partly attributable to the more effective utilisation of the rescue service resource and accident reporting system PRONTO.

¹⁾ Lost-time accidents (resulting in at least one lost work shift).

Research and development

Among the R & D projects completed or participated by TUKES in 2002 were the following:

- Doctoral dissertation: Market Surveillance of Electrical Products in Finland – Analysis and Development
- Investigation: Safety Management System – Adoption of the Seveso II Directive and its Effects in Finland
- Heating Oil Storage Safety and Risk Management Project (CISTER)
- Project: Risk-Based Maintenance and Inspection of Pressure Equipment (RBMI)
- Survey: Consumers and the Safety of LPG Equipment
- Survey: Consumers and the Safety of Firework Products
- Project: Reliability of Smoke Detectors and Safety Culture
- Survey: Nickel Content of Articles of Precious Metals and Nickel Dissolution
- Survey: Administration of Electrical Safety in Finland

TUKES' safety culture research programme and its aims and results were assessed in a separate project. The results showed that the surveys had reached the aims set for them and the entire programme. The programme produced information on the content and essence of the safety concept, on the measurement of the safety culture in enterprises, and on consumers' opinions, attitudes and behaviour. It also generated a meter to be used for monitoring the latter consumer-related issues in the future.

The opinions of TUKES' surveillance clients were again explored after two years. The respondents felt that technical safety/reliability in their branch in Finland was good. They also considered TUKES to play a very important role in maintaining technical safety and reliability. Generally, the clients interviewed were very satisfied with TUKES in the encounters relating to the surveillance, inspection and license procedures. Total assessments for different situations were positive (average over 4 on a scale of 1–5). Three respondents out of four felt that they had received enough information from TUKES in issues regarding the safety and reliability requirements applying to their operations.

Communication

Work on TUKES' communications strategy was completed, involving an analysis of the stakeholders' expectations for our communication operations.

New services were launched on our website, including a guidebook on electrical safety at home and a register of electrical contractors. The survey of the users of the website gave

quite positive results as regards the functionality, information content and accessibility. The automatic release distribution service covered a total of 1,140 clients.

The most visible communications measure was the fireworks campaign implemented before the New Year's Eve. It was mainly conducted through TV spots and open-air advertising under the theme "There is no safe firework – wear safety goggles". More than 3.9 million Finns remembered that they had seen the campaign. The campaign's attention value was excellent: as many as 87 % of persons over 10 years of age had seen it, which is more than ever before. The campaign also worked superbly compared with other similar campaigns.

An administrative-historical survey under the theme "Hundred Years of Electrical Safety Statutes in Finland" was completed and presented on special coverage webpages in November.

A great number of brochures, guidebooks and media releases were published during the year. These included the *Liquid gas (LPG) guidebook for sales staff and importers*, *CE-marking of construction products*, *Measurements in general trade*, *Home electrical safety tips* and *Look out for wedging danger in elevators*. In addition, we issued a new general brochure, two TUKES reviews, reports in TUKES Publications Series, press releases, and a general presentation video of TUKES in Finnish and English. We also attended fairs (Electrical Industry 2002, Safety and Security 2002, Gold Silver Watch, and Fashion Fair). Besides, our experts were popular lecturers in training occasions.

Payroll strength

In 2002, TUKES' payroll strength was 111 person-years.

Staff by Group in 2002

Group	
Plant and Installations	
Surveillance	46
Product Safety	
Enforcement	32
R&D and Support Services	33
Total	111

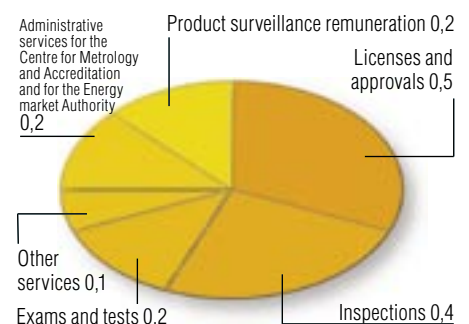
Staff by education in 2002

Doctor, licentiate	6
Graduated engineer	32
Other university	13
Polytechnic	2
Engineer	24
Other college or intermediate	35
Comprehensive school	4

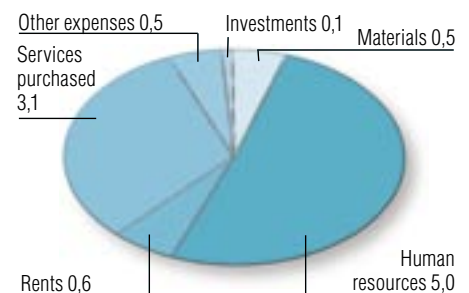
Finance

The total costs of TUKES' operations amounted to EUR 9.8 million. Income from services sold and other income totalled EUR 1.6 million.

Income and remunerations in 2002 (total EUR 1.6 million)



Expenses by type in 2002 (total EUR 9.8 million)





New pressure equipment standards adopted

The SFS standards in old pressure vessel statutes were abolished. The new SFS-EN standards provide detailed instructions for the design and manufacture of pressure equipment, and they are the harmonised standards laid down by the Decision of the Ministry of Trade and Industry on Pressure Equipment (938/1999). Pressure equipment or assemblies manufactured in accordance with them can be assumed to meet all the essential safety requirements provided by the Decision. Harmonised standards will also be drawn up for construction materials and for the acceptance of the methods applied to permanent joints and of the persons carrying out them.

On our website you will find a list of the reference numbers of all harmonised standards in the Decision by product category. The list is updated along with new standards as soon as the relevant reference numbers have been published in the Official Journal of the European Communities. Standards and the Finnish translations can be purchased from The Finnish Standards Association SFS, www.sfs.fi.

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Doctoral dissertation on safety management

In February, Quality Manager Kirsi Levä defended her doctoral dissertation entitled "The functionality of safety management systems: Strengths and areas for improvement at major-hazard establishments".

The material was collected directly from companies through telephone interviews in 1999–2001, from assessments by TUKES' inspectors and from inspection reports.

According to the dissertation, plants are currently in different stages of development in addressing their safety issues. The largest problems still involve management liabilities and duties, ensuring the safety of subcontractors, functioning of maintenance work, control of changes, and taking dangerous chemicals into consideration when measuring safety and when carrying out internal and management audits. Companies do not learn enough from material and environmental damage, which results in operational weaknesses that, in the worst case, can lead to major accidents. The problems result from strategic weaknesses in management systems. To develop the systems, it is absolutely essential that the management recognise their duties and responsibility in a well-functioning safety management system.

The model of the practicability of safety management systems, which was drawn up as a result of the research, approaches the topic from the point of view of learning at the organisational level. The model supports the functional assessment of corporate safety management systems, recognition and selection of



development targets, and continuous learning in organisations. The research also yielded information for developing statutes and targeting the authorities' surveillance activities.

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Doctoral dissertation on market surveillance of electrical equipment

A dissertation was completed by Chief Safety Engineer Jyri Rajamäki on market surveillance of electrical equipment in Finland. It discusses the practicability and future challenges for market surveillance, indicating

that the present market surveillance system in Finland is effective, but there are problems in sight, if progress cannot be made in standardisation and international co-operation.

The level of market surveillance varies greatly in the European Economic Area. As a system, the current market surveillance lends itself particularly to serially produced consumer articles, not so well for single articles or those manufactured in small series. In addition, market surveillance does not always allow controlling the compatibility of appliances whose electromagnetic properties greatly depend on their installation type, use or location.

The launching of dangerous or electromagnetically incompatible electrical appliances onto the market could be prevented most effectively, if companies considered safety investments more rewarding. In addition, legislation and the general atmosphere should be developed towards a situation where it would be economically more profitable to carefully ensure the safety and electromagnetic compatibility of equipment manufactured, imported and/or sold than to try to minimise the costs arising from measures to indicate its conformity.

It can be assumed that any improvement in the conformity of the electrical equipment sold on the small Finnish market from the present level will be more attributable to improved pan-European market surveillance than to the progress achieved by TUKES' own actions. TUKES should thus assign resources to international market surveillance co-operation.



Products today move worldwide quickly and easily, so the aim should be to formulate global safety and EMC requirements and to cater for their comprehensive surveillance.

The dissertation was published in TUKES Publications Series Vol. 9/2002 and it can be ordered from TUKES.

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