

OVERVIEW OF THE SAFETY TECHNOLOGY AUTHORITY (TUKES)

The Safety Technology Authority (TUKES) is a state agency operating under the aegis of the Finnish Ministry of Trade and Industry (KTM) and is responsible for providing *surveillance, development and safety communication services* in its fields of operation as provided by law. TUKES comes under the direction of the Technology Department of the Ministry of Trade and Industry. Besides the Ministry of Trade and Industry, TUKES also serves the Finnish Ministry of Transport and Communications (LVM), and Ministry of the Interior (SM) and Ministry of the Environment (YM). TUKES operates throughout Finland and its activities are based on its authority provided by law.

TUKES was founded in 1995 as a result of European integration and a reorganisation of public administration. Despite being a young agency, it inherited a long national tradition of technical safety surveillance and inspection operations. TUKES continues the official responsibilities of the Technical Inspection Centre (TTK) and the Electrical Inspectorate of Finland (SETI). (See Figure 1).

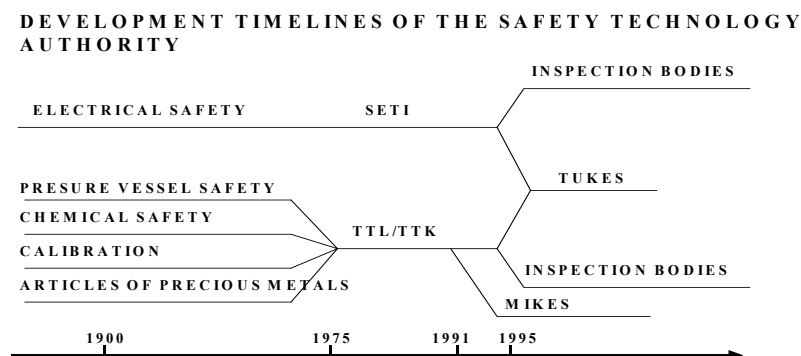


Figure 1. Development timelines of the Safety Technology Authority

Principles and strategies guiding our operations

The following values form the cornerstone of TUKES' operations: impartiality, transparency, service-mindedness and a desire for continuous improvement and innovation. TUKES' mission is to uphold and foster a culture of technological safety to protect people, the environment and property. TUKES' mission and service philosophy, operating strategies, management principles and quality objectives were defined in the "TULEVA TUKES" (TUKES in future) document in 1997. The vision was revised in 2000.

TUKES' new vision includes both an internal and external element. *Our aim is a society with safe, reliable technology.* This is reinforced by the information, willingness and action of consumers and companies. This aim is based on a control system of which TUKES is a part (see Figure 2).

The focus areas of social impact and customer satisfaction of TUKES operations outlined in the development policy for 2007 are:

- a reduction in the serious shortcomings concerning compliance with requirements
- a reduction in the number of serious accidents
- an increase in people's positive attitude to safety
- greater safe use and maintenance
- modern practical control system

The key principles in carrying out our operations are:

- to combine surveillance and the communications supporting it and to develop them into a preventive operation
- to master the technological and normative skills relating to our operations
- to diversify and expand our excellence relating to this in the initial stage of our operations
- to acquire other expertise and services from the market
- to use the project approach
- to regularly assess our operations.

We have complemented these principles with more specific strategies drafted for *TUKES' development, communication, human resources development, R&D, information management, project management, accident investigation, e-service and cooperation with interested parties.*

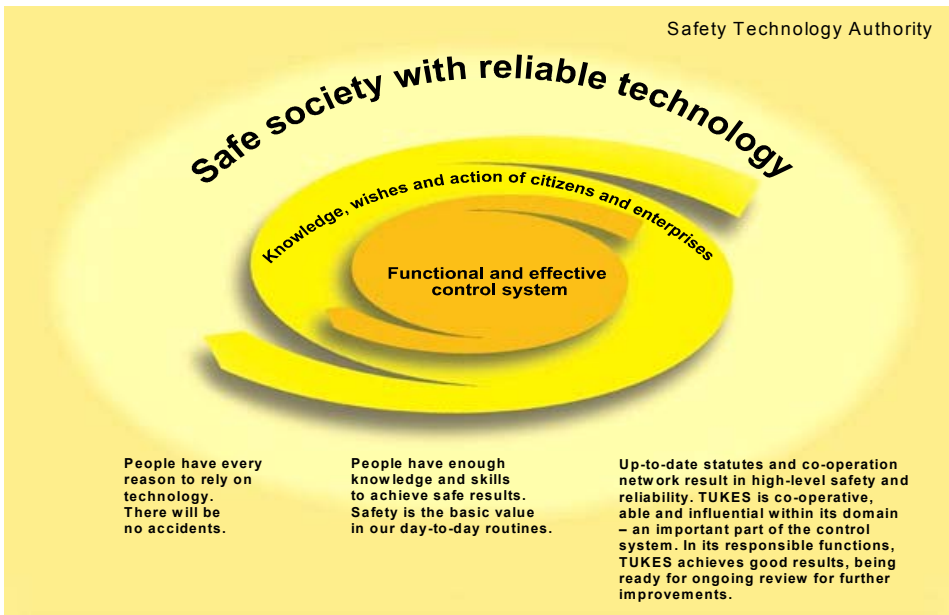


Figure 2. TUKES's vision

Organisation

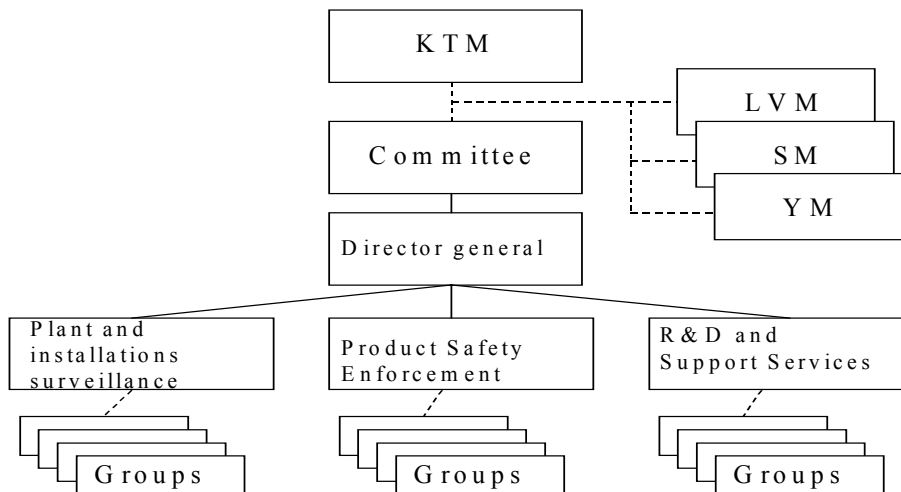


Figure 3. TUKES' organisation

During the first few years, TUKES' organisational structure was based on its core business technologies (pressure vessel, electrical and process safety and the reliability of measuring instruments). In 1999, TUKES restructured its organisation around strategic groups (products, plants and technical services). This restructuring was driven by client needs, harmonisation of TUKES' operations, preparation for changes in the operational environment and additional tasks likely to be given us in the future.

TUKES' operations are driven, overseen and developed by a Board of Directors appointed by the Finnish government. The Director General is responsible for the development and profitability of TUKES' operations and for ensuring that it achieves its objectives. TUKES is divided into three groups: Plant and Installations Surveillance (PIS), Product Safety Enforcement (PSE) and R&D and Support Services (R&D and SS).

Offices and equipment

TUKES is based in Helsinki and has separate inspectors in Kuopio, Lahti, Tampere and Oulu. TUKES buys the testing laboratory services it requires from outside providers. The machinery and equipment used by TUKES is mostly hardware relating to office and

information systems. All TUKES people have the use of personal data processing equipment. Our website has been made in response to client needs and we are currently preparing for e-commerce. Our main business properties consist of rented office and archive premises.

Employees and excellence

TUKES is an expert organisation whose operations are based on a high level of expertise.

Group	1995	1996	1997	1998	1999	2000
Plant and Installations					46	48
Surveillance						
Product Safety Enforcement					31	31
R&D and Support Services					29	30
Total	82	93	101	106	106	109

Table 1. Employees by group

TUKES' core expertise is to combine surveillance, safety communication and development so as to focus on supervising the essential and to process and impart the information we gather to promote the highest possible safety. The cornerstones of our excellence are:

- general legislation and legislation applying to special branches
- safety and reliability technologies (and inherent surveillance)
- an insight into management systems
- an insight into assessment and audit procedures
- operational technical support; expertise in automation, energy, chemical, material, construction, electricity and manufacturing technologies and metrology.

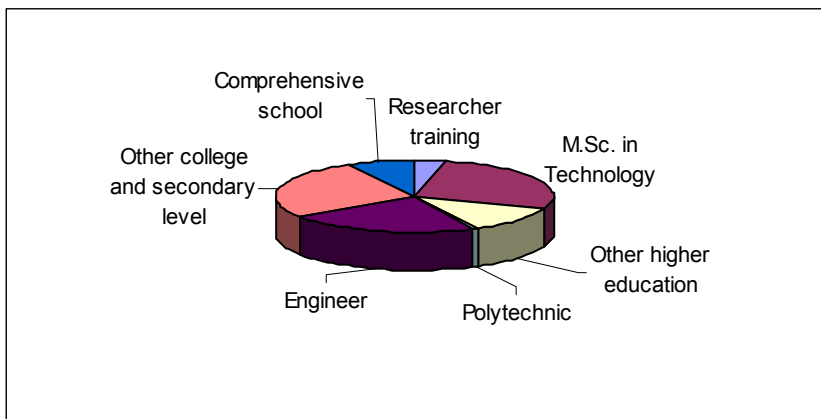


Figure 4. An analysis of employee educational backgrounds

Our major areas of excellence aside from technological expertise are development of the best surveillance expertise, expertise in surveillance focusing, networked operations management and supporting R&D and communication skills and international cooperation skills.

Finances

TUKES is funded out of the state budget. Expenditure in 2000 amounted to around *FIM 55.7 million* (estimate for 2001: *FIM 61 million*) and its income was around *FIM 9.4 million* (estimated for 2001: *FIM 9 million*). Payment for services rendered accounts for around 15 per cent of TUKES' operations.

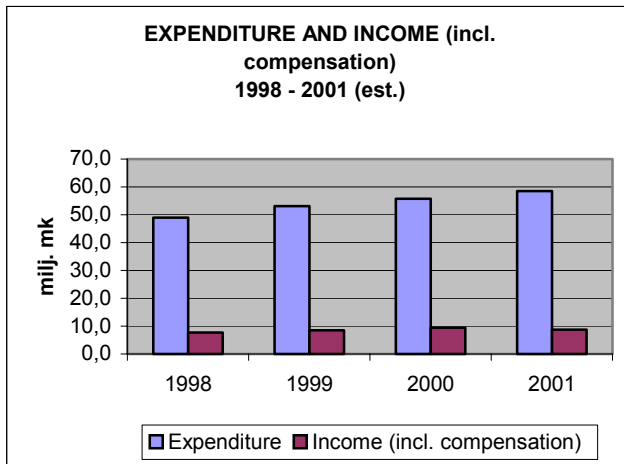


Figure 5. Expenditure and income 1998-2001

Working hours are divided between surveillance, development and safety communication, with around half of the hours worked being spent on surveillance and the other half on development and communication.

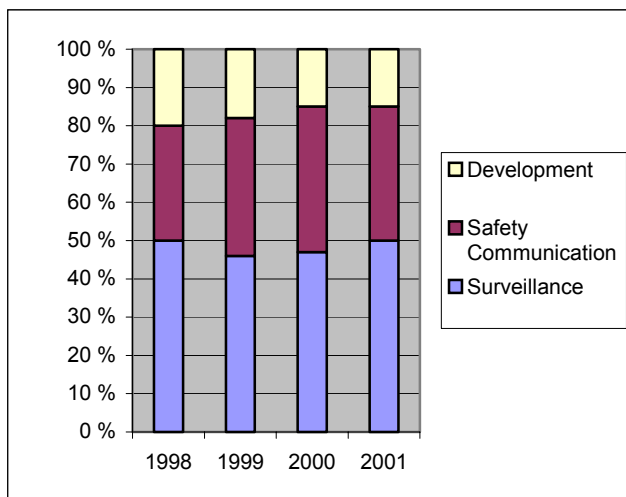


Figure 6. Working hours by use.

Operations, products and services

TUKES' operations are provided by legislation (The Safety Technology Authority Act and Decree). It is also subject to the provisions of several other general statutes governing public administration. In addition to the above, statutes relating to safety and reliability in many fields also serve as a basis for the operations of TUKES' branches (see Table 2).

Field of legislation	Products	Plants, installations and technical services
Electrical Safety Act	<ul style="list-style-type: none"> ▪ electrical appliances and accessories ▪ electromagnetic compatibility ▪ atex products 	<ul style="list-style-type: none"> ▪ installation, inspection and service of electrical equipment ▪ installation, inspection and service of elevators
Act on the Energy Efficiency of Appliances	<ul style="list-style-type: none"> ▪ energy efficiency and markings of certain electrical appliances ▪ boiler efficiency 	
Chemicals Act and Act on Explosive Substances	<ul style="list-style-type: none"> ▪ explosives ▪ gas appliances ▪ chemical tanks ▪ aerosols ▪ atex products 	<ul style="list-style-type: none"> ▪ industrial handling and storage of chemicals ▪ handling and storage of liquefied gas ▪ manufacture and storage of explosives ▪ transmission and use of natural gas ▪ installation and service of oil-fired heating and gas appliances ▪ inspection of oil tanks
Pressure Equipment Act	<ul style="list-style-type: none"> ▪ pressure equipment 	<ul style="list-style-type: none"> ▪ use of pressure equipment ▪ inspection of pressure equipment
Rescue Service Equipment Act	<ul style="list-style-type: none"> ▪ rescue service equipment ▪ portable fire extinguishers 	<ul style="list-style-type: none"> ▪ installation, inspection and service of fire alarm equipment ▪ installation, inspection and service of fire alarm equipment ▪ inspection and service of portable fire extinguishers
Act on the Transport of Dangerous Goods	<ul style="list-style-type: none"> ▪ tanks for the transport of dangerous goods 	
Land Use and Building Act	<ul style="list-style-type: none"> ▪ building products 	
Mining Act		<ul style="list-style-type: none"> ▪ mining operations
Calibration Act	<ul style="list-style-type: none"> ▪ measuring instruments and function 	
Articles of Precious Metals Act	<ul style="list-style-type: none"> ▪ articles of precious metals 	

Table 2. TUKES operations by branch

TUKES operations are based on surveillance, R&D and safety communication. We strive to achieve our safety and reliability objectives, in other words to prevent damage to people, property and the environment and to verify measurement results. We focus our surveillance activities on the most critical areas from the safety and reliability aspect and, to this end, we employ various means of surveillance including inspections, testing, licence procedures, requests for reports and proof of competence and, if required, we also take various actions such as imposing a ban on sales. Cooperation with national and international authorities is becoming increasingly important in our surveillance work.

R&D and communication not only support our surveillance operations but are also part of them. Our R&D activities seek to collect new information about technical safety and reliability, impact mechanisms and control system to develop TUKES' operations and focus. Our communication activities include notification and training as well as collecting, processing and distributing technical safety information. Today, international cooperation, especially involvement in cooperation with the authorities of EU Member States, constitutes an important part of the above activities.

Clients

TUKES highlights partnership and its willingness to serve in its operations. This is why at TUKES we consider the concept of "client" as including all clients, partners and interested parties for whom we provide services or with whom we work. Clients are divided into six groups according to expectations and needs: the Finnish government as representative (and owner) of the community, surveillance objects, consumers, the authorities with whom we work, other partners and internal clients. The needs and expectations of different clients vary and may even contradict each other: ministries need surveillance services and help in drafting legislation, companies need a licence to operate and information and advice about technical safety requirements, consumers need to be able to rely on the safety of products available on the market.

Interaction between service providers, partners and TUKES ranges from joint projects to the purchase and surveillance of services.

Client group	Needs and expectations	Products and services
Government <ul style="list-style-type: none"> (KTM, SM, YM, LVM,...) 	Continued high safety level No dangerous products on the market Up-to-date legislation Information available to promote new safety Fair competitive environment in the business community	Surveillance of law enforcement in the industry and associated licences and inspections Participation in the development of legislation Monitoring and promotion of safety and reliability and related research Collection, processing and distribution of safety information
Surveillance objects <ul style="list-style-type: none"> Process and power plants Inspection bodies Installation and service firms Manufacturers and importers Retail trade 	Information, guidance, instruction Fair surveillance and ensurance of a fair competitive environment Added value relating to safety	Licences, certificates, approval, inspections, instructions, information, safe products and equipment, plants and functions
Consumers, citizens	Safety and reliability Information, guidance, instruction	Safe products, equipment, plants, reliable installation services and measuring instruments, information about safe products and working procedures
Cooperation with national and international authorities <ul style="list-style-type: none"> fire and rescue authorities consumer authorities industrial safety authorities EU Commission working groups supervisory authority working groups 	Statements, information, interpretations Cooperation in drafting legislation and supervision Information exchange	Information services, R&D services, joint surveillance projects
Partners and service providers <ul style="list-style-type: none"> Inspection and testing bodies Research bodies and higher education Organisations in the industry Computer, training, development and communication services 	TUKES information exchange, expert services, cooperation in R&D and communication Partners: information exchange, information, interpretations, cooperation, sale of services	TUKES information about safety legislation and development in the industry, job opportunities Partners: expert services (communication products, R&D, reports)
Internal clients <ul style="list-style-type: none"> Support services producers Colleagues 	Successfulness, professional excellence, development, sense of responsibility, service-driven and cooperation	Information services, training, support and R&D services business process customer chains

Table 3. Clients, their needs and expectations and TUKES's services

Challenges of change

Changes in the safety surveillance operational environment had a major impact on the establishment of TUKES. There has been a thorough reform of the statutes applying to TUKES' most important branches: electrical safety (1996), pressure equipment (1999), dangerous industrial chemicals (1999), articles of precious metals (2000), rescue safety equipment (1999) and construction products (2000).

Legislative reform in respect of mining safety and explosive substances is currently underway. A start has been made on the legislative reform of metrology. These reforms are being made in the light of both Finland's EU membership and the call for reform arising from national needs.

Changes will continue at many different levels. The challenges of change and development include

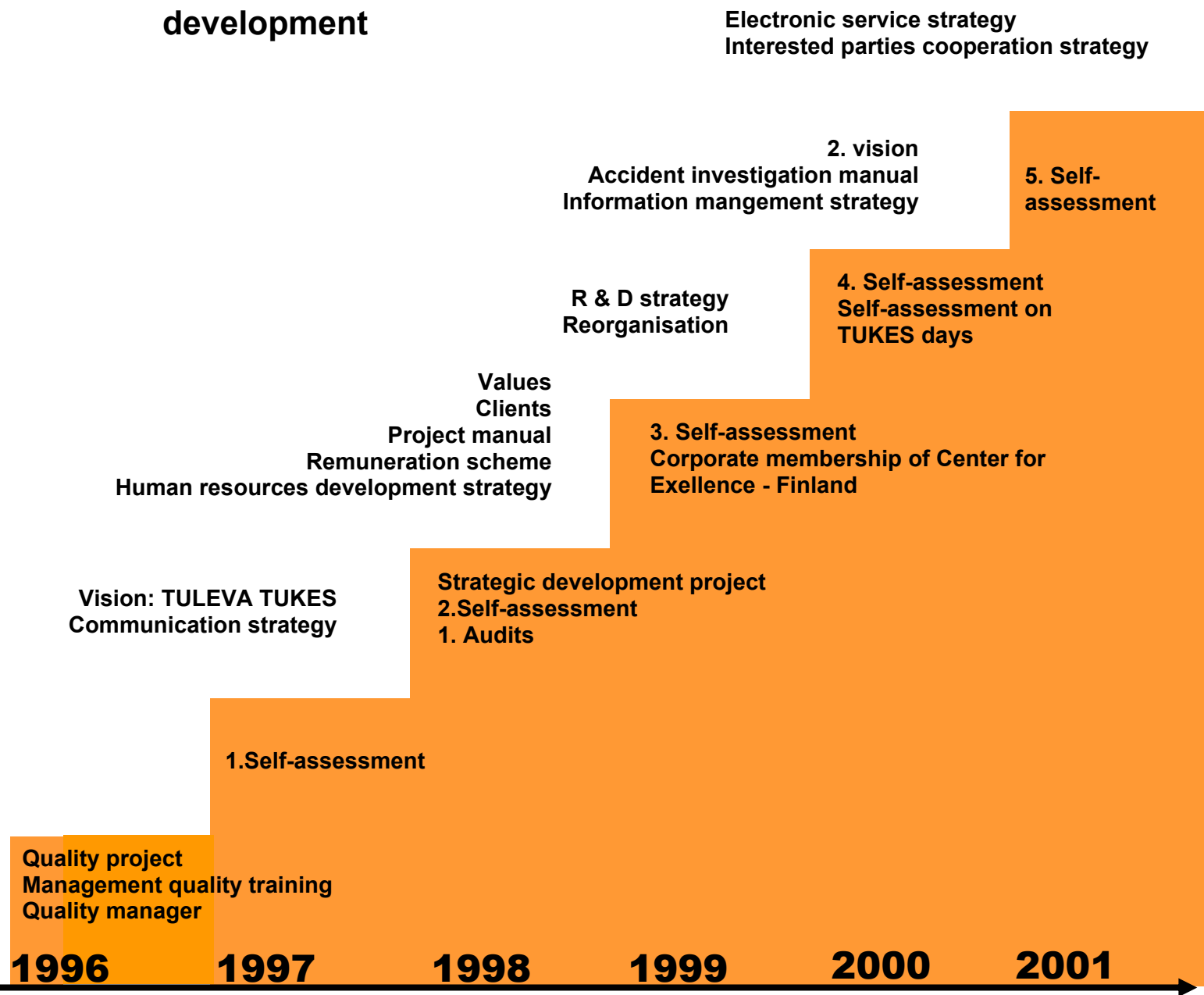
- further development of the structure of central government and the development of services (ministries, central government offices)
- *EU Directives* in force (pressure equipment, Seveso, etc.)
- *new responsibilities assumed by TUKES* (rescue service equipment, construction products)
- *new technologies*
- *changes in attitudes to safety* (environmental threats, etc.)
- *globalisation* (multinational, companies, global markets)
- *increasing European integration and EU expansion*
- *e-commerce*

R&D and quality development

Quality development has been combined with operations planning and control. Challenges of change in the operational environment have led to R&D becoming a core part of TUKES' activities. *TUKESin strateginen kehittäminen (Strategic Development of TUKES)* (1998) was written as a platform on which to develop TUKES' operations. There is also a separate R&D strategy. During its brief history TUKES has implemented 1-3 strategic development projects and 3-5 projects to develop surveillance procedures.

TUKES started work on quality assurance from the very outset in 1995, when the position of quality manager was established. The quality manager is under the direct authority of the TUKES' Director General. Key stages at the launch of the quality project included a start on quality training, TUKES' first vision, the introduction of self assessment for management, the start of audits, auditor training, quality training for the entire staff, corporate membership of the Center for Excellence – Finland (CEF), the start of benchmarking (participation in the pan-European Mutual Joint Visiting projects, Finnish Ministry of Finance's development of BSC excellence and Helsinki University of Technology's Employee Expertise TOPPI Idea Workshop) and TUKES' second vision. Figure 7 shows the key stages, major results and successes in development.

Stages in TUKES's development



RESULTS

Surveillance clients

The thoroughness of licence handling, the relevance of inspections and surveillance visits, the correct targeting and attention to essential safety issues is important as regards the effectiveness of operations. Client satisfaction results reflect the satisfaction of surveillance objects with licence handling and inspections and their content.

Licence application and notification handling times are proportionate to the needs of surveillance objects. Client satisfaction studies show that clients are satisfied with lead-times. Client satisfaction results also indicate the satisfaction of surveillance visit clients.

Figure 8 shows the trend in client satisfaction with TUKES' licence and notification handling 1998-2000 and benchmark data from licence procedures in another official organisation.

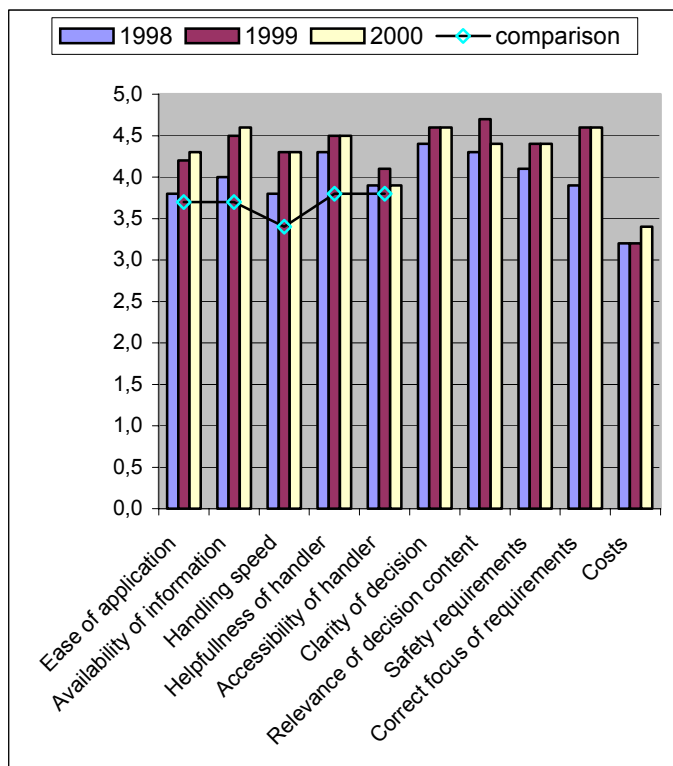


Figure 8. Client Satisfaction with license and notification handling (1998 written questionnaire 1999-2000 telephone survey, benchmark data: Allocation of radio frequencies to clients, Finnish Communication Regulatory Authority, 1999).

Figure 9 shows client satisfaction with inspection visits.

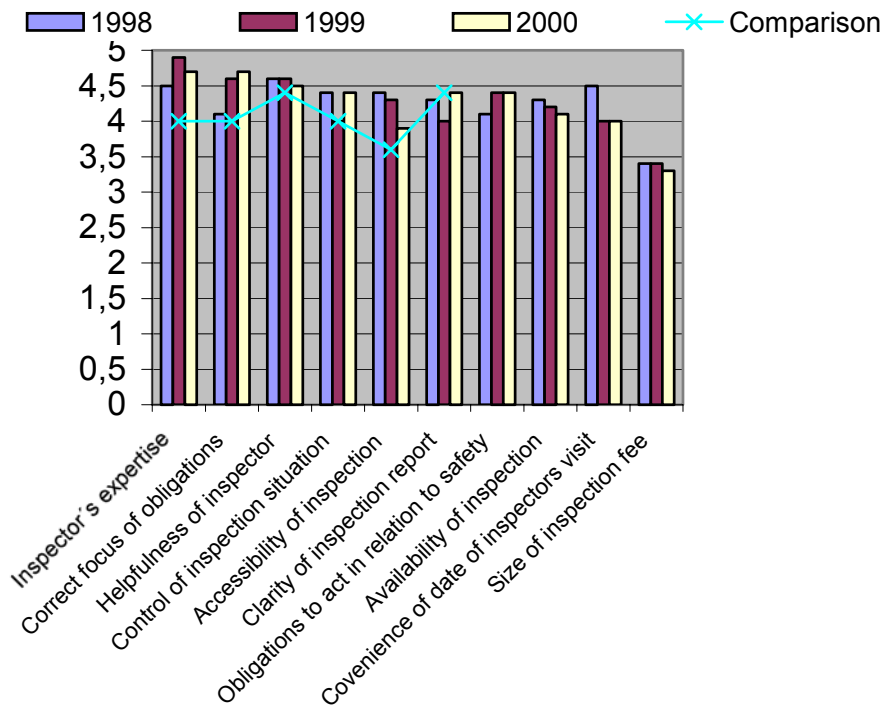


Figure 9. Trend in client satisfaction with inspection visits (best value of evaluation of industrial safety inspectors' activities carried out in various industrial safety districts used as benchmark data)

Employee points of view

An employee job satisfaction survey is carried out each year. The information given here is for 1999 and 2000, the latest survey was carried out in May 2001. The questionnaire includes benchmark reference material (expert organisations, white-collar employees). The objective in 1999 was to maintain employee satisfaction at its present level. The objective in 2000 was a positive improvement in employee satisfaction (development policy 2006, 2007). The percentage of replies received was 91 per cent in 2000, compared to 88 per cent in 1999 (see Figure 10).

Survey topics are:

- job content and arrangements (amount of work, job developability, possibility to impact on job, clarity of objectives)
- how the organisation works (supervisor, operational improvement, information flow, working group performance, management of change, training)
- organisational atmosphere (general atmosphere in group, experience of job appreciation, job satisfaction)
- tolerance of work on health

TUKES' results are similar to the reference material in terms of both profile and standard: as a rule the average values on the scale are at least as high as those in the reference material, and in many points slightly more positive than in the reference material.

Relatively stronger areas compared to the reference material are management, especially group leader support and trust, and the possibility to impact on the job. Management of change and training are also considered as being slightly better at TUKES than in the reference material. The clarity of objectives is the area where it is felt there is most room for improvement. TUKES' overall result in this area was slightly below that of the reference material. Based on these results, TUKES has improved its management by results and clarified the setting of personal goals (see 2c). In other respects, the results were more or less on a par with those of the reference material.

In places there are minor differences in the results for each employee group. For example, younger employees and those who have been working for TUKES for less than a year consider some areas in the organisation as slightly more positive than average, compared to older age groups. Likewise, the mental and physical stress of work seems to increase with age. Women give slightly more positive feedback than men about management to group management and team leaders. For job groups, above average feedback generally comes from directors and team leaders, whereas persons responsible for support services are slightly more critical in most points than other groups are.

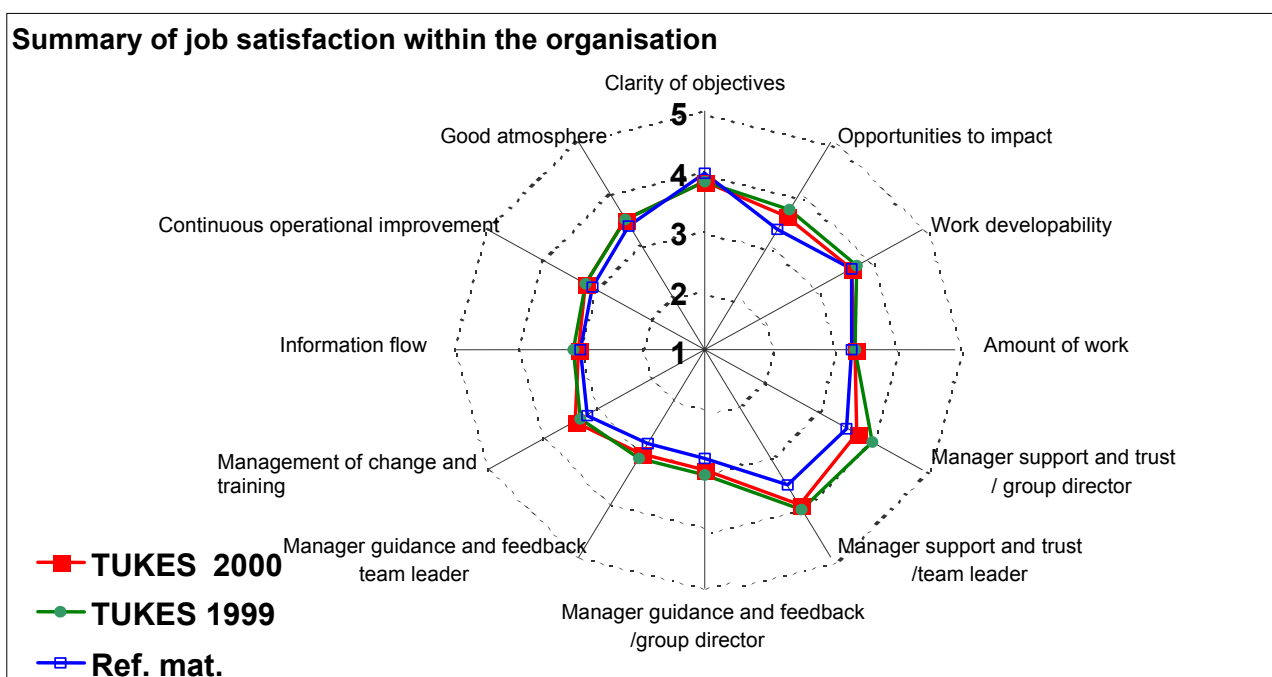


Figure 10. Results of job satisfaction survey 1999-2000 compared to reference material

Key performance results

Improvement in the number of accidents and observations made during inspection visits are the key results in monitoring the level of safety. Table 4 and figures 11-15 show some examples of key results.

Accident group	Number					Deaths				
	1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
Electrical appliances	54	45	64	42	51	4	3	3	1	5
Liquefied gas	12	7	8	18	11	-	3	-	2	1
Dangerous chemicals	57	68	76	59	79	1	1	-	2	3
Elevators	8	22	14	13	12	1	-	1	-	1
Pressure equipment and transportation tanks	14	20	12	22	19	1	-	-	-	-
Explosives	1	2	5	5	3	-	-	2	-	1
Fireworks, home-made explosives	3	96	11	17	34	-	-	-	-	-
Natural gas	1	3	6	3	1	-	-	-	-	-
Mines and quarries	1	-	2	-	2	1	-	-	-	-
Other	7	11	18	11	3	-	1	-	-	-
Total	158	274	216	190	215	8	8	6	5	11

Table 4. The number of accidents and deaths through accidents, of which TUKES is aware between 1996 and 2000. The figures also include dangerous situations.

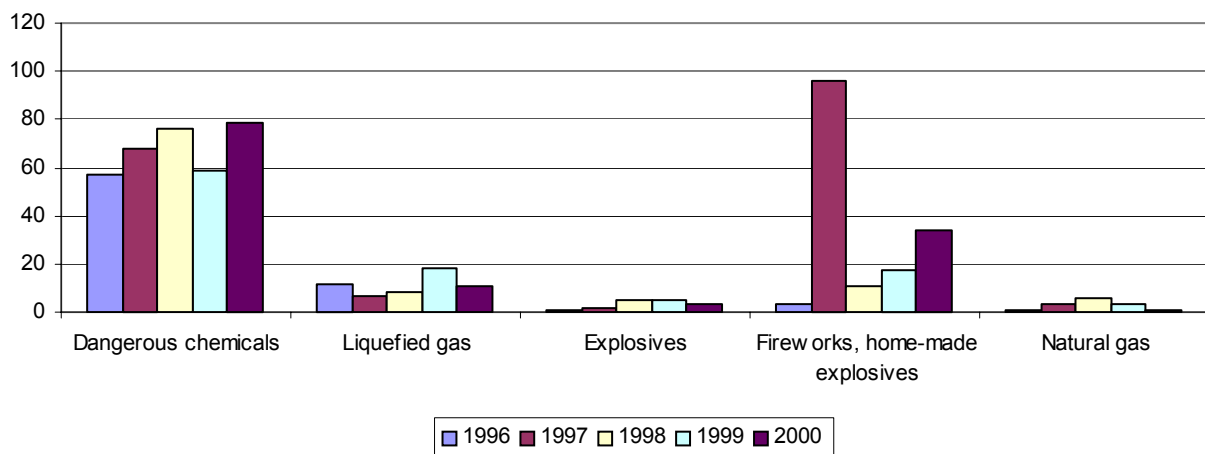


Figure 11. Accidents involving chemical safety

Serious chemical accidents

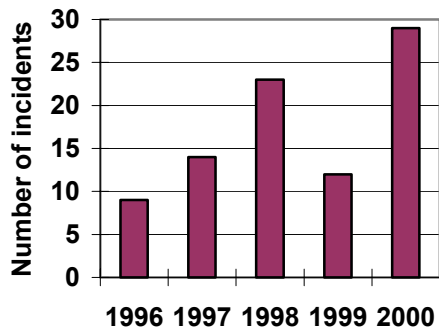


Figure 12. Chemical accidents classed as serious

Electrical incidents

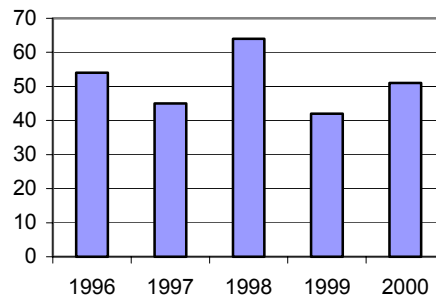


Figure 13. Incidents caused by electricity (all those of which TUKES is aware)

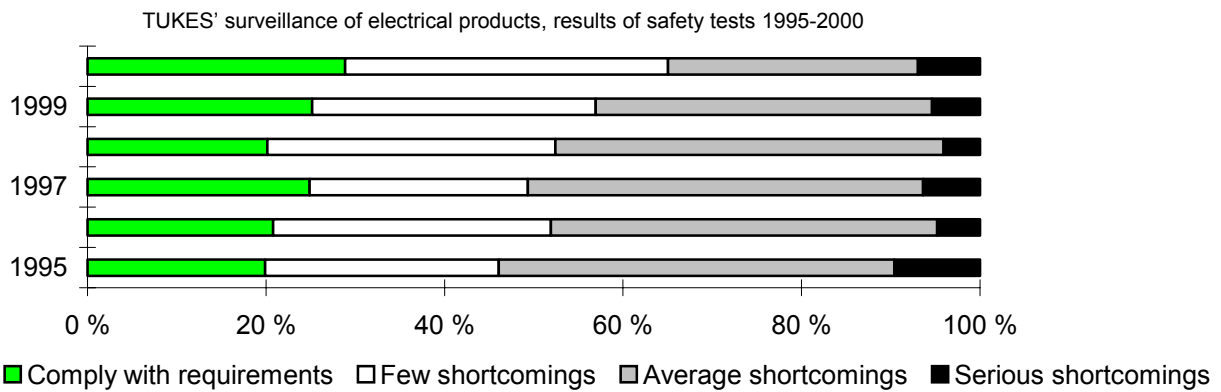


Figure 14. Trend in compliance of electrical products

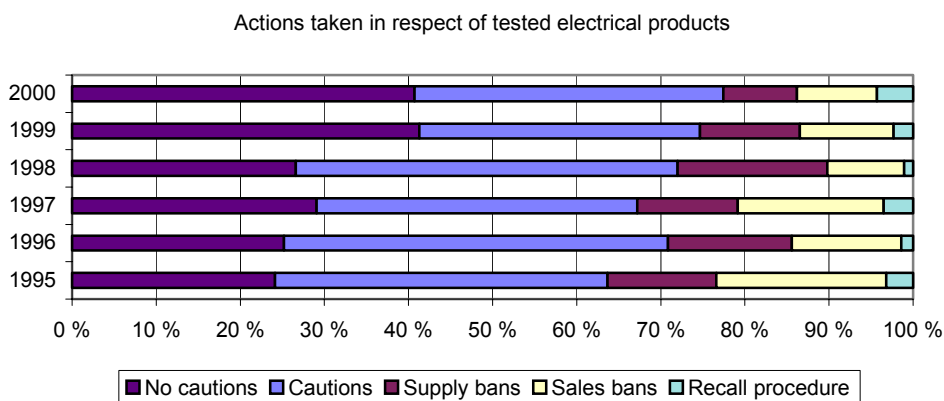


Figure 15. Actions taken in respect of tested electrical products