Teemu Reiman & Pia Oedewald

The assessment of organisational culture

A methodological study

The assessment of organisational culture

A methodological study

Teemu Reiman & Pia Oedewald

VTT Industrial Systems

Abstract

This report examines the assessment and development of organisational culture in complex organisations. It covers definitions of organisational culture and safety culture, and the research that has been conducted. The common definition of organisational culture is adjusted with the aid of the core-task concept. Organisational culture is defined as a solution created by an organisation for the demands set by the core task. The development of an organisation's operations requires an understanding of the overall dynamics (culture) of the organisation's activities, but also an assessment of the impact of culture on operational efficiency. The criteria of organisations' operational efficiency must be determined on a case-by-case basis. The Contextual Assessment of Organisational Culture (CAOC) methodology proposed in the report uses both qualitative and quantitative methods. Determining the culture prevailing in a company at some moment in time requires the study of the company's values, practices, artefacts and of the core task defined by them. By comparing these elements an attempt is made to clarify the underlying assumptions prevailing in a company. Core-task analysis, on the other hand, helps to determine the main content of work and the critical demands it sets for working practices. The research requires close cooperation with target groups and covers both the practical problems and the resulting research problems which one strives to resolve. One aim is to commit personnel to ponder and reflect on their own work and in this way to reduce opposition to change and to create the conditions for the continuation of internal development work also after the research is completed. Operational development seminars organised during the research deepen the researchers' picture of the culture and act at the same time as a practical channel for operational development and as a chance for personnel to exert their influence. methodology has been developed particularly for application in improving the efficiency of complex organisations and communities of practice, in other words to improve productivity, safety and well-being. The purpose of this report is to present the general basis of the methodology and its relationship to other organisational research and development.

Contents

1. Introduction

This report is part of the Finnish Trade and Industry Ministry's National Safety Research on Nuclear Power Stations 1999–2002 (FINNUS/WOPS), the objective of which is to promote the safety of nuclear power generation in Finland. The report is based on organisational culture research (see e.g. Reiman 2001a, Reiman & Norros 2002) and Finnish-language literature reviews (Reiman 1999, Reiman 2001b, Oedewald et al. 2001) conducted within the framework of the project. The Technical Research Centre of Finland (VTT), the Trade and Industry Ministry, and Radiation and Nuclear Safety Authority contributed to the funding of the research programme.

The report examines safety culture and organisational culture research and assessment mainly in the nuclear power industry. The report does, however, also have points of contact with and applications for other industrial sectors. The report defines the concepts of safety culture and organisational culture and examines the connections between them. The report also covers methods for studying and assessing culture and presents a preliminary model of the Contextual Assessment of Organisational Culture methodology developed in VTT. The objective of the report is to promote understanding of organisational culture and a capacity for cultural assessment and development.

2. Cultural perspective on organisations

The concept of organisational culture was in common use in the 1980s. Organisational research originally focused strongly on the surveying of corporate climate, but in the 1980s the organisational climate concept was to some extent replaced by concept of organisational culture. Climate was redefined as the visible expression of organisational culture (see e.g. Glendon & Stanton 2000, p. 198). There is no generally accepted definition of either concept, even though both terms have been in use for more than a decade (see e.g. Smircich 1983 and Alvesson & Berg 1992, Moran & Volkwein 1992). Organisational culture is said to mean, for example, an organisation's values (Deal & Kennedy 1982), an organisation's generally accepted system of meaning (Pettigrew 1979) or an organisation's operating philosophy (Ouchi 1981). Despite the uncertainty of the concept's definition, the significance of culture is understood, particularly in the corporate world. Traditional mechanistic management models have been found to be inadequate and contrary to fundamental human nature. A new concept was needed to describe and explain individuals' actions in an organisation so that their working capacity could be improved (Alvesson & Berg 1992).

2.1 Theories of organisational culture

According to Schein's (1981, 1985, 1992) theory, organisational culture is defined as "A pattern of shared basic assumptions that the group learned as it solved its problems of *external adaptation* and *internal integration*, that has worked well enough to be considered valid and, therefore, to be taught to new members as a correct way to *perceive, think* and *feel* in relation to those problems." (Schein 1992, p. 12, italics altered). According the Schein, organisational culture is the *learned* result of group experiences, and it is to a large extent unconscious (Schein 1992). Schein considers culture to be a three-layer phenomenon (see Fig. 1).

As Figure 1 shows, organisational culture can be examined on different levels. This should also be reflected in the selection of cultural research and development methods. Different methods will generate information about the different levels of culture. These are examined in more detail in Chapter 2.

The first level of culture consists of visible organisational processes and various artefacts. For example, dress codes and the general tidiness of the workplace are artefacts that tell something about the organisation's culture. The first level, according to Schein, is difficult to interpret, however, because it represents the most superficial cultural phenomena, i.e. only reflections of the true corporate culture. For example, behaviour – which is a cultural artefact – is also influenced by countless factors other

than a company's culture (Schein 1992). The first cultural level also consists of various quality systems as well as information systems and databases connected with safety and the control/monitoring of operations (cf. Reason 1997). Similarly, cultural artefacts can be considered to include accident statistics, sick leave and corresponding indicators, which, correctly interpreted, can be used to form conclusions about the deeper characteristics of an organisation's culture. This interpretation requires effective and diverse research methods and an understanding of the internal dynamics of the culture.
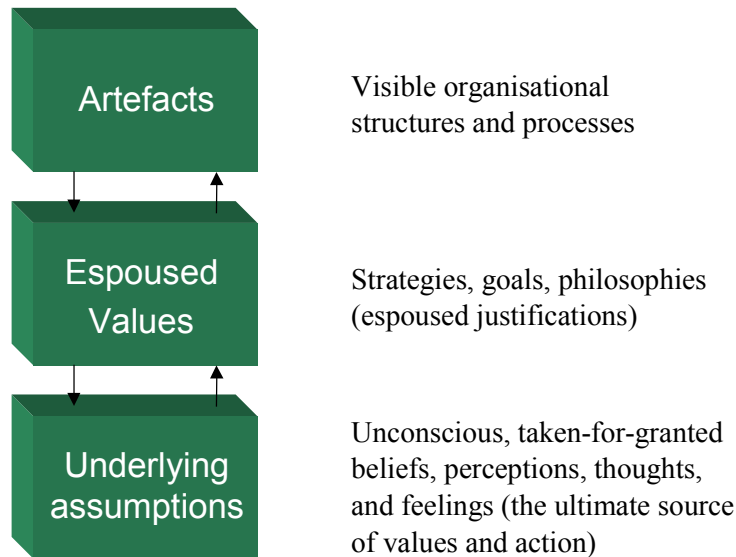
Artefacts	Visible organisational structures and processes
Espoused Values	Strategies, goals, philosophies (espoused justifications)
Underlying assumptions	Unconscious, taken-for-granted beliefs, perceptions, thoughts, and feelings (the ultimate source of values and action)

Figure 1. Schein's (1992) model of organisational culture.

The second cultural level in the Schein model consists of the organisation's espoused values. These are apparent in, for example, the organisation's official objectives, declared norms and operating philosophy. Espoused values, however, do not always reflect a company's everyday operations. Most important in terms of operations is the culture's deepest level, namely its underlying assumptions (Figure 1) (Schein 1985, 1992).

Underlying assumptions relate to the group's learned solutions to problems relating to external adaptation and internal integration. These solutions gradually become self-evident assumptions that cannot be called into question later. Problems related to *external adaptation* concern views of an organisation's tasks and objectives as well as the means to implement and assess them. A solution has to be found for them so that the organisation can function and succeed in its environment. Problems related to *internal integration* and to maintaining operating capacity concern the creation of a common language and concepts, defining group limits, the level of authority relationships and interaction, as well as methods of reward and punishment. A solution has to be found for these so that members of the organisation can function together in an organised and predictable working community (Schein 1985, 1992).

Schein (1985, 1992) also distinguishes so-called deeper underlying assumptions, which relate, for example, to views of human nature as well as to the nature of information and the human activity in question. These are strongly influenced by national culture, but an organisation always forms its own view of them in its operations. One can assume that the deeper underlying assumptions originally acted as a basis for interpretation in determining and resolving the problems of internal integration and external adaptation. In other words, they influence how the members of an organisation perceive, think and feel in matters relating to the organisation.

Underlying assumptions function as an unconscious basis for action and a range of decisions that shape the culture further. Underlying assumptions, therefore, are not static; culture is in an epistemological sense the creation and recreation of shared reality. In Weick's terms it can be said that organisational reality is an ongoing accomplishment (Weick 1993).

According to Schein, even though underlying assumptions direct the actions of a company's members, the organisation's underlying assumptions cannot be inferred from such actions (which are only cultural artefacts, see Figure 1). Actions are also always influenced by situation-specific and individual factors (Schein 1999). Espoused norms and an organisation's official rules may, however, be in conflict with everyday (artefact level) actions. Thus they can also be in conflict with the underlying assumptions, which in the end direct these actions. Organisations may not necessarily perceive this conflict themselves or they may even actively deny its existence.

Although Schein's theory has been criticised (e.g. Hatch 1993, Collins 1998, Parker 2000), it covers the central elements of culture well, namely its holistic, partly unconscious and learned nature. Organisational culture, therefore, is not merely a single new variable which describes organisations and which can be examined separately from the other variables that affect an organisation's activities, such as the organisation's structure, strategy, market orientation and the technology it uses. Organisational culture as a scientific concept strives to describe and explain activity in the organisation as a whole.

An integrated organisational culture reduces the uncertainty and ambiguity experienced in an environment and maintains an organisation's operating capacity (Schein 1992, Weick 1995). Organisational culture is a dynamic phenomenon, however. Weick (1995) examines the continual and collective reality-building process that takes place in an organisation. In this process the meaning of various events is deliberated and a common view is formed based on incomplete information. Weick calls this process sense making (Weick 1995). Creating meanings is not a democratic process; power struggle and politics are also very much involved (Alvesson & Berg 1992). History also plays an

important role in the building of meanings. Weick (1993) states: "remembering and looking back are a primary source of meaning" (Weick 1993). In its actions an organisation creates its own opportunities and boundaries again and again (Weick 1993, see also Giddens 1984).

Leadership has a central position in organisational culture. Managers (and the founder of an organisation) play a key role as creators of a culture's underlying assumptions (Gagliardi 1986, Schein 1985). If, however, an attempt is made to explicitly "lead" a culture, the effects might be entirely contrary to what is expected. For example Kunda (1992) writes about an organisation in which the workers criticised the "cultural propaganda" and "ideology" spread by their manager. Some of the workers said that they did not want to hear it (the propaganda) or pass it on to their subordinates, because to their mind it was more sensible to discuss how matters and decisions were handled in reality (Kunda 1992, p. 180). This shows that it is often forgotten that culture expresses itself in the management of daily affairs much more significantly and deeply than in the official statements of managers. The organisational culture concept loses its explanatory power. The same danger is evident in the management of "safety culture" (see Section 1.2).

According to Parker (2000, see also Alvesson & Berg 1992), "organisational culture management" as a tool of consultants and as a management method is often a direct continuation of Taylorism and work rationalisation and efficiency thinking: an attempt is made to develop control mechanisms that are not based on "compulsion" or on direct orders (Parker 2000). Workers strive to get to command themselves or each other. The managers' task is considered to be the creation of a culture and its manipulation. The power of cultural theories is seen particularly in fields in which direct control and guidance mechanisms are difficult or impossible to maintain. In a strong culture all workers must, according to these theories, adopt the manager's values as their own underlying assumptions and act according to them. Conflicts or differing opinions are considered harmful and every effort is made to eradicate them (Alvesson & Berg 1992, Kunda 1992, Parker 2000). The above-mentioned features are also found in Schein's theory (see e.g. Parker 2000, p. 61-67). The roots of Schein's theory lie in system theory (see e.g. Lewin 1947) and in structural functionalism (see e.g. Parsons 1951). As a result, Schein's theory emphasises the unity and functionality of culture.

Theories about the unity of culture have been undermined by showing that various subcultures are evident in organisations. Parker (2000) shows that workers identify with different groups within an organisation, for example on the basis of age, gender and education (see also Reiman 2001a). Parker distinguishes three typical principles of group formation:

- distinction between functions and units on the basis of the location of units and job description

- distinction between genders and distinction according to years spent in the organisation

- professional distinction e.g. on the basis of educational background (Parker 2000).

Some of these subcultures may also feel more unity with the corresponding unit in some other company than with most of the people in their own company. Subcultures are distinguished from each other, among other things, according to how they see their role and the significance of the other subcultures in their company (Parker 2000, McDonald et al. 2000).

There are differences in the motives of individuals to do work; some seek security from an organisation, others look for challenges and risks. These individual factors have an influence on how an organisation's culture is experienced. Collins (1998) sums up the matter by stating that cultures are historically developed, socially maintained and individually interpreted. Every culture, however, has an in-built tendency to unify behaviour. This happens by creating common norms and a shared social identity. The norms determine how one ought to behave in each situation and role. The norms simplify and regulate social interaction and make it predictable. They therefore standardise the operation of the group (Hogg & Abrams 1988, p. 159, see also Goffman 1959 and Levi 2001). A new individual infers the true norms of the group that guide its actions from the behaviour of the group's members. Some of these norms are conscious, some are unconscious (i.e. underlying assumptions).

Some members are seen as model representatives of the group. These individuals have a more powerful influence than others on the formation of norms (Hogg & Abrams 1988, see also Helkama et al. 1998). The formation of social identity is at the same time an important source of self-esteem for individuals and a binding force for the group (Hogg & Abrams 1988, Levi 2001). Because one tends to see oneself in a slightly more positive light than reality (see e.g. Verkasalo 1996), this identification with the group also emphasises those sides of the group which are seen as positive and strong. Because of this it is difficult to assess one's own culture objectively and people are sensitive to pressures to change from outside the culture.

2.2 Safety culture

After the Chernobyl nuclear accident the term safety culture was introduced (IAEA 1991). It was only then that people understood that reasons for accidents were not only technical faults or human errors made by some individual, but that management,

organisation and attitudes also influence safety for better or worse. The International Atomic Energy Agency IAEA (1991) defines safety culture as follows: "Safety culture is that assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance." (IAEA 1991, p. 1, see Figure 2). The definition is normative, namely it includes norms and criteria that a safety culture must fulfil. This means that there is a prior assumption that it is possible to define general principles and so-called good operating practices, which function from one context to another and are equally suitable for all individuals, i.e. that they are applicable as they are also in other companies. The term safety culture generally refers to factors relating to both occupational and nuclear safety.
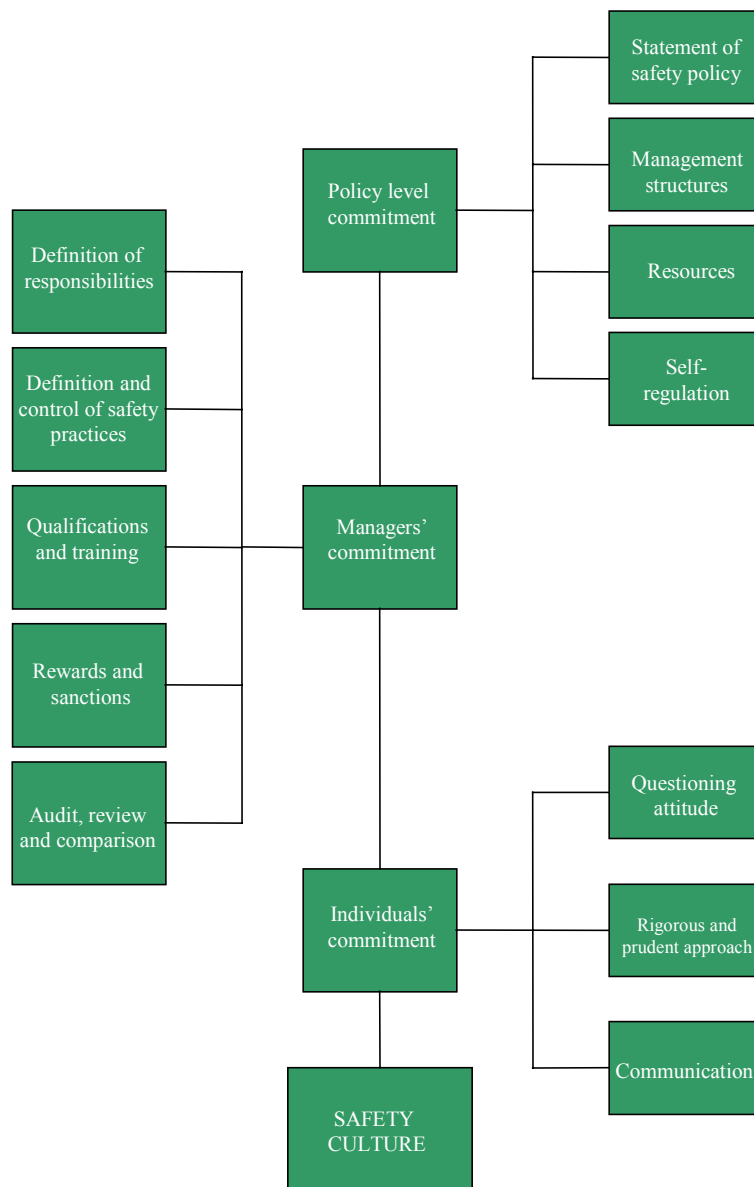

Figure 2. INSAG's (IAEA 1991) presentation on safety culture.

A good safety culture does not mean that no mistakes are made at all, rather it means that mistakes are responded to openly; they are considered to be learning opportunities (IAEA 1996). In the literature, the criteria of a good safety culture are considered to be e.g. the following:

- a safety policy that includes the organisation's vision, objectives as well as official criteria and general principles in relation to which operations are evaluated

- a competent and democratic management practice and a visible commitment of management to safety

- positive values and attitudes towards safety and a commitment to safety on the part of the staff

- clear definition of responsibilities and obligations, including clear job descriptions and their significance for safety

- operating practices that take safety into account

- a balance between safety and production

- competent staff and good training methods

- good motivation and job satisfaction

- fairness and trust among the staff and management

- quality and up-to-date rules and regulations and good operating and maintenance procedures

- sufficient interpretation and reporting of events and accidents

- good flow of information between the different levels and task areas of the organisation

- good design and maintenance of technical equipment

- continuous improvement of operations and safety

- sufficient resources

- working relationships with the authorities

(Grote & Künzler 2000, p. 132, see also Zohar 1980, Reason 1993, IAEA 1991, 1994, 1996, 1997a, 1998, ACSNI 1993, HSE 1997 and Lee 1998). The list is quite comprehensive, even though most of these could be the criteria for any successful company. The criteria, however, still do not tell about the dynamics of how a culture that emphasises safety is built and how it is maintained (cf. Section 1.1). The Health and Safety Executive HSE (1997), the authority responsible for occupational health and safety in the United Kingdom, emphasises the definition of safety targets that are measurable and the systematic monitoring of the fulfilment of these targets. In addition

it emphasises the "4 Cs" as characteristics of safety culture, namely control, cooperation, communication and competence.

2.3 The culture of an effective organisation

A problem in the safety culture criteria outlined in the last section is that they are often presented separately from an organisation's other characteristics, such as the organisation of work, technology, organisational structure, business strategy and financial decision-making. Safety culture is thus considered to be independent of (or only loosely dependent on) the wider organisational culture. An IAEA report (1998), which examines safety culture's points of contact with organisational culture, states that "safety culture is a subset of the wider organisational culture" (IAEA 1998, p. 13). The indicators of safety culture are typically focused on an organisation's internal operations at the expense of external orientation (see e.g. Cameron & Quinn 1999 for a classification). There are, however, many other factors in an organisation's culture which have an indirect influence on safety. A separation into two different cultures (organisational culture and safety culture) is not justified on theoretical, nor even on practical, grounds (Reiman 1999, 2001a, see also Guldenmund 2000). On the contrary, this increases uncertainty and conflict as far as the content of the terms is concerned. It also reduces the term safety culture to refer only to factors known in advance and clearly connected with safety, such as safety attitudes and values. This results in the loss of the holistic perspective originally sought with the organisational culture concept. Safety culture is reduced to an everyday expression that does not explain anything. It remains an artefact of the organisation (see Figure 1).

Glendon and Stanton (2000, p. 194), according to Burrell and Morgan's (1979) original model, separate organisational culture theories into interpretational theories, which emphasise the culture's social constructive and emergent nature (interpretive approach), and functional theories. In functional theories culture is considered to exist as an ideal towards which one must strive and which one can and must manipulate in the company's interests. Glendon and Stanton classify Schein's organisational culture model as belonging to the interpretational theories (see Section 1.1, however). From an interpretational perspective, by culture is meant a metaphor by which one strives to understand a company's operations and ways of reacting to environmental pressures. The ideal culture concept, which most *safety* culture studies represent, is in accordance with a functional way of approach, and thus it does not offer the best possible way to understand and explain a company's actions at any given instant. Thus it is also difficult to understand and assess how safety and other desired states (efficiency, well-being) at any given instant in a company's culture are construed among the employees (see also Rochlin 1999). Possible conflicts between these objectives also remain unexplained.

The term safety culture does, however, have a practical value as a management philosophy. Moreover, it is a well established term in the field of nuclear power. Consequently it is not sensible to seek to abandon the concept. In research and development activity, however, one has to be aware of the limitations of the concept.

The basis of this report is that safety must not be considered as being separate from an organisation's other operations or operational objectives (see Reiman 2001b, Oedewald et al. 2001, Reiman & Norros 2002). Vicente (1999) sets three criteria for the effectiveness of a sociotechnical system. According to his definition, an effective sociotechnical system is safe, productive and healthy. The culture should support the achievement of all these objectives. For example, in the generation of nuclear power, organisational culture can mean safety and actions aimed at balancing and optimising generation. Thus new kinds of methods, taking into account the overall objective of the organisation, are needed to assess a culture appropriately. According to Section 1.1, by the term organisational culture is meant values, norms and underlying assumptions which arise over time during a company's history and which affect all of a company's operations. All of these may also have an influence on a company's safety, productivity and well-being (Reiman 2001a, 2001b, Oedewald et al. 2001, Reiman & Norros 2002).

3. Review of existing methods and research

3.1 Self-assessment of organisational culture

The practices of both a safety culture and of a so-called learning organisation include the involvement of staff in the assessment and development of their own work, for example with the help of development discussions and joint seminars. Self-assessments, when carried out correctly, are a good way to promote critical examination of one's own work and, through this, work development. They are not objective methods of studying culture, however.

In self-assessment, individuals, groups and the management level critically assess their own activity and its productivity in relation to targets defined in advance. The purpose of self-assessment is to develop operations by activating staff to reflect on their own work. Self-assessment can be implemented so that one group within a company assesses the actions of some other group, or so that a group assesses its own actions (IAEA 1997c). Both methods contain many challenges, however, in addition to the above-mentioned advantages. An assessor who comes from within a company knows the organisation's working practices better than an outsider, but he or she cannot necessarily be considered independent. A member of the company's staff has an understanding of the climate prevailing within the company, including the various power and personal questions. The company's language and concepts are also more familiar. On the other hand, by belonging to the same culture he or she is as much a "prisoner" of his or her culture as the interviewee. The interviewer's own aspirations and relationship with the interviewee might, even so, influence the end result of the interview.

The IAEA (1998) proposes three levels of safety culture[1], which can be used as a basis for self-assessment. The IAEA (1998) also proposes questions that a company can use to determine which level its safety culture is on. The problem with these is that many of the criteria of the worst level, for example, are unconscious, such as the statement "people are viewed as system components". This is clearly an underlying assumption, which might also prevail in an organisation where attention and respect for individuals is emphasised as an espoused value.

The IAEA (1991, 1996) proposes a host of questions which a power plant can use to "assess" its safety culture. These are divided into the following subareas (IAEA 1991, 1996):

---

[1] The levels are "a safety culture based merely on the obeying of rules" (1), "safety as a company objective" (2) and "the continual improvement of safety" (3) (IAEA 1998).

- Safety policy ("Does the company have a clear safety policy?")

- Group-level safety measures ("Does the company's board of directors have expertise in matters relating to nuclear safety?")

- Definition of responsibilities ("Are safety responsibilities clearly defined and shared?")

- Training ("What kind of resources are allocated to training?")

- Selection of supervisors ("Do the annual operational assessments include a special section on attitudes to safety?")

- Reviews of safety operations ("Is the plant's safety level compared with other plants in the same country / internationally?")

- Emphasising safety ("Do the company's incentive mechanisms include matters relating to safety work.")

- Workload ("Does the company lay down restrictions on the amount of overtime?")

- Relations between plant management and the authorities ("Are relations open, honest, but even so sufficiently formal?")

- Supervisors' attitudes ("How often are supervisors' orders directed towards improving safety?")

- Individuals' attitudes ("Are guidelines adhered to even when there would be a faster way to perform a task?")

- Local working practices ("What is the general condition of the plant, e.g. tidiness?")

- Management of supervisors / monitoring in the field ("Does senior management visit the plant regularly?")

According to the IAEA, the same questions can be used both in self-assessments and in audits carried out by the IAEA (IAEA 1996).

Cox and Flin (1998) propose that the various self-assessment guides offer very little methodical assistance (i.e. how to assess, study and develop the culture in question). They are mainly so-called wish lists. Neither do the guides offer any kind of criteria for making a comprehensive assessment. The objectivity and validity of assessments can be improved, however, also by the involvement in them of experts who do not belong to the company. The IAEA (1997c) also recommends the "calibration" of results with the aid of external experts.

According to the definition of culture ("self-evident underlying assumptions", Schein 1992), it is very difficult for a member of a given culture to study that culture himself. Erroneous characteristics can be considered central ones, such as features that seem

surprising to a member. To an outsider, on the other hand, a company's self-evident characteristics seem surprising when they differ from external ways of thinking. In internal assessments the assessor belongs to the same group (culture) as those who are being assessed. The assessor therefore has a common source of identity with those who are being assessed. As was proposed in Section 1.1, group identity has a number of functions that relate to separating a group from other groups. This separation does not strive to look for differences as precisely as possible, rather it strives to maintain a group's working capacity and its self-esteem. Thus a group's view of its own culture (its strengths and weaknesses) is distorted. Because of this it is difficult to explore all of a culture's central characteristics from within.

In addition to internal assessments, companies also have a number of different operational indicators available to them. Attempts are also made to measure safety and safety culture. Cultural indicators are an attempt to produce a quantitative assessment of the "level" of a culture. They do not, however, explain a culture to a sufficient extent nor describe its dynamics. Safety is more than a lack of accidents. Safety indicators should not be distinguished from general operational indicators (Ruuhilehto & Vilppola 2000, Henttonen 2000).

The surveying and assessment of culture requires theoretically justified psychological instruments and research methods that go deeper than self-assessments. It is not possible to generate a single parameter with these.

3.2 Cultural research methods

3.2.1 Questionnaire studies

International safety culture questionnaire studies have used lots of different scales and measured a number of different variables. As a result, the methods have generated little material that allows the comparison of the organisations studied and the examination of the reliability and validity of the instrument used. Questionnaires that survey safety culture have been used e.g. by Grote & Künzler (2000), Cox & Cheyne (2000), Cooper (1998), NRC (1998), Lee (1997) and Jacobs & Haber (1994). Cameron & Quinn (1999) have developed general indicators of organisational culture. Cameron and Quinn's model is based on empirical research on organisational effectiveness (Quinn & Rohrbaugh 1983, Quinn 1988, Cameron & Quinn 1999).

A working group of the International Atomic Energy Agency IAEA has, on the basis of its own safety culture definition (see Section 1.2), prepared 140 questions, which can be used to tailor a questionnaire form or as questions in interviews (see critique in Section

2.1) (IAEA 1991, 1994, 1996). Ostrom et al. (1993) propose a questionnaire that can be used to survey respondents' attitudes and opinions about safety. In an AEA Technology safety culture questionnaire, safety culture is divided into three main areas, which are management, procedures (e.g. information flow, training) and the individual (commitment, personal views) (Harrison 1996).

Organisational culture questionnaires have also attempted to clarify the influence of individual factors on perceptions and views of culture. Lee (1998) used a questionnaire form to study the safety attitudes of staff at the Sellafield nuclear fuel processing plant. Lee measured the connection of attitudes with behaviour by asking in the form whether respondents had been involved in an accident that led to them spending three or more days away from work. The research showed that victims of work accidents had lower safety attitudes than those people who, according to the questionnaire, had not suffered an accident. A questionnaire study conducted in an regulatory organisation (Reiman 2001a, Reiman & Norros 2002) showed that impressions of the connection of one's own work with the organisation's overall objectives influenced perceptions of the organisation's culture. Similarly a poor impression of the influence of one's own work was linked to higher work stress (Reiman 2001a, Reiman & Norros 2002).

In their research in different areas of industry, Flin et al. (2000) surveyed the common features of safety climate. They analysed 18 different indicators and found only five common themes:

- *management*

- *safety systems*

- *risks and the perception of risks*

- *competence and training*

- *work pressures and workload.*

Although objective data acquisition is talked about in connection with questionnaire forms, such forms often create in an organisation attitudes and opinions that were not there before. The implementation of a questionnaire study in an organisation is already a major intervention into the organisation's working practices. This makes it difficult to ascertain the validity and reliability of the questionnaire method. Questionnaire methods have been criticised for the fact that they are strongly influenced by the researcher's own conceptions. The results are skewed by matters that the researcher, in preparing the questionnaire, has considered important. Often the forms only reveal self-evident facts or matters that are only interesting from a research standpoint. The person preparing the questionnaire, moreover, cannot know in advance which dimensions are significant in the said organisation from the point of view of work performance. The biggest problem

in using questionnaires is therefore the basis on which the dimensions to be measured should be chosen. It is difficult to know in advance what one should ask. (Denison 1990, Rousseau 1990, Sackmann 1991, Schein 1992, 1999)

Organisational culture questionnaire methods have been criticised for the fact that it is not possible for them to map out a culture's underlying assumptions, because they are unconscious and often only poorly explainable. Grote & Künzler (2000) mentioned one problem of questionnaires, namely that they measure views but not actions. Schein also criticises questionnaires: "[B]ecause culture is unconscious and self-evident to those who work within it, it cannot be studied with compulsive methods, such as questionnaire forms. To reach the underlying assumptions, one has to observe and interview." (Schein 1985.) According to Schein, the results of questionnaire forms are always in themselves artefacts and as such they require interpretation and empirical verification (Schein 1992). Questionnaire studies measure the central level of organisational culture (see Figure 1), i.e. attitudes, beliefs and values (see Glendon & Stanton 2000).

Used correctly, questionnaires can provide sufficiently valid *descriptive* information about an organisation and particularly about the views and attitudes of its staff. Questionnaires can also be used to clarify the various connections between variables and to explain statistically the differences found. Understanding the *significance* of the reasons for the differences requires research that is more detailed than questionnaire methods, such as interviews, observation and the analysis of documents[2]. Only then can one answer the cultural *why* questions. An advantage of questionnaire studies, however, is that one can have a greater number of participants in a study than in interview studies, for example. With a questionnaire it is possible to reach all of the members of an organisation. Making different kinds of comparisons is also more objective, and anonymity is easier to guarantee, than in interview studies, for example. Without quantitative research, we cannot obtain data that is statistically comparable with other groups (and organisations) and usable in repeat studies. Quantitative material also enables a more objective monitoring (e.g. as a consequence of a development project) of change (see e.g. Sackmann 1991, Juuti 1997).

3.2.2 Interviews

Most of the organisational culture studies include staff interviews, at least to some extent. The interview method has been used by e.g. Hammar et al. (2000) in comparing

---

[2] Compare Section 1.1: "Organisational culture as a scientific concept strives to *describe* and *explain* activity in an organisation as a whole."

19

safety culture ideas between Finland and Sweden. Ignatov (1999) used the interview method to study culture on the level of norms (see Section 1.1) among nuclear power plant control room workers. The idea of the KSA situational research method (KSA 1997, see also IAEA 1997b) is to present in the interview concrete events and problem situations and to enquire about the reactions and measures of the interviewees in the said situations, and about how the interviewees describe the actions of others in situations and how they describe the reactions of others to their own actions. From these answers can be determined an individual's knowledge of safety regulations, the norms and values activated by a particular situation as well as understandings of the risks involved (KSA 1997, IAEA 1997b). The central idea of this approach is that, because the most apparent element of safety culture is visible behaviour, it is more sensible to interpret it directly than to enquire about abstract values and attitudes. Sackmann (1991) presents his phenomenological issue-centred interview method, in which the key element is an unstructured interview process that proceeds on the interviewee's terms.

With interviews it is possible to bring out subjective opinions and views on the significance of issues, which is not always possible with a structured form. Moreover, the uncovering of entirely new, surprising issues and ideas is more probable in interviews than in questionnaire studies. In interviews one can enquire about the *justifications* for actions and different measures. These justifications reveal the kind of picture that interviewees have of their work and its requirements as well as the kind of *meanings* that individuals assign to their actions (see e.g. Norros & Klemola 1999). For interview studies, however, there exists no tradition according to which answers can be interpreted from a cultural perspective.

There are also certain problems common to interview studies. Speaking about issues or imaginary behaviour (see e.g. KSA 1997) is not the same thing as acting in a natural situation. Imaginary situations lack the emotional charge of real situations. The interview situation also influences answers. The interviewer in the situation is at least an imaginary authority, and thus the interviewees may feel they are in some sort of test that is enquiring about the correct procedure – not necessarily that which is implemented in practice. The main problem as far as interviews are concerned is the choice of themes and questions. Sackmann (1991) states that structured interviews partly suffer from the same problems and the same distortions as questionnaires. Most important, according to Sackmann (1991), are interview questions based on problems that arise during the research process. Another way of holding interviews is to use the so-called in-depth method (see e.g. Schein 1985). During in-depth interviews, as open and as broad questions as possible are used, giving interviewees the opportunity to deal with them from the perspective of their own culture. The separation of individuals' opinions from cultural content is a problem, however (Sackmann 1991).

Although the holding of interviews requires much in the way of resources, there is good reason to include them in every cultural study in order to clarify cultural meanings. It is also worth conducting interviews where possible at different levels and in different job groups within an organisation. In addition to interviews one can also use e.g. questionnaires, whereupon all of a company's workers have an opportunity to express their opinions. Interviews deepen the image of a culture obtainable through questionnaires, and a questionnaire provides information about the scope of opinions obtained by interviews.

3.2.3 Studying special situations

Studying the critical events of an organisation's history can, according to Schein (1992), reveal much about the organisation's ways of reacting and its working practices in exceptional situations. An organisation's operating models in these situations provide lots of information about the kind of underlying assumptions prevailing in the organisation (or prevailed at the time of an event), for example about its workers (does the organisation try to survive financial difficulties by e.g. reducing its workforce or by cutting wages?) or about the exercise of power (does the organisation trust the workers' opinions and ideas at moments of crisis or does it control the crises solely from management levels?). These cases may not lead directly to the underlying assumptions of organisational culture, but they give valuable clues and hypotheses for subsequent validation.

The utilisation of special situations in developing operations is difficult, because any situation or modelling made from it does not in itself represent the operation of the system, but merely a single unique event (see Rasmussen 1995, Norros et al. 1998, Norros & Nuutinen 1999). Norros and Nuutinen (1999) also propose that in interpreting special situations one should examine those systematic demands which are set in each environment for normal activity. Core-task analysis (see Chapter 3) is based on this assumption. The intentional nature of human activity must also be taken into account in interpreting situations. Some reason always exists for human activity. Clarifying these justifications is important in order to understand the origin of an accident or dangerous situation. In accident investigations information is obtained about people's working practices and the influence of corporate culture on the formation of these working practices. If we want to improve operations, normal situations must also be studied to define criteria for good working practices (Norros & Nuutinen 1999).

VTT has developed research into so-called natural operating situations. The purpose of this is to clarify, among other things, the working practices of those driving the process in genuine situations. The method models the essential features of a known decision-

making situation, i.e. the boundary conditions set for the operation of the situation. These models are compared by observing the performance of individuals in a real situation. The assessment results in an understanding of their working practices. The method includes so-called situation-specific interviews, by which is meant interviews in which as large a proportion of the questions as possible are directed at some concrete event. Experts of the subject area are utilised in the assessment of activities (see Norros et al. 1998). This method alone is not sufficient to study culture – nor has it been developed for that purpose – because it typically models only one or a few tasks. In addition, in the study of working practices, the explanatory model emphasises individual working practices, while cultural research focuses on that which is common to all, and an attempt is made to find differences mainly on the level of so-called subcultures. Working practices are an individual "solution" made in a certain context to the demands of the environment and they reflect the culture, but also personal characteristics and tendencies. The method does, however, provide information about those operational demands around which the culture has taken shape. Moreover, it provides information about the working practices of the professional group being studied and their views on the demands of their work (see also Chapter 3).

3.2.4 Observation

By observation is meant an external researcher coming into the organisation to observe everyday activities. Observation can be participatory (whereby the researcher has some certain role in the performance of work) or it can be merely so-called objective observation without personal participation in activities. A good example of participatory observation combined with interviews is offered by Parker (2000), who reports three case studies, all of which examine cultural change from the influence of information technology. Schumacher (1997) carried out a five-year ethnographic study in a software company. Kunda (1992) also employed the ethnographic method to study the culture of a high-tech company.

An external observer encounters the problem that the quantity of available information exceeds the observational capacity. Owing to this, there is good reason to consider in advance the material to be collected and the dimensions to be examined. The research problem should be delineated precisely to avoid having to examine everything that is happening in the company in question. One possibility is to exploit an artificial environment, for example a control room simulator. This solution, too, is not entirely problem-free, because simulator activity differs from natural activity. Simulations and various scenarios can also be produced for groups of workers other than process controllers. For example Weick (1987) and Hatch (1993) write about strategy creation scenarios directed at management which attempt to uncover cultural assumptions in

practical working. The situations can also be real situations, given that observation is possible in practice. In observation one gets to see only what people actually do. Activity includes, however, the meanings giving to these deeds, and individuals should therefore be questioned about these either through participatory observation in the work situation itself or, for example, by filming the work performance on video and going through it together with the worker (so-called stimulated recall) (see e.g. Norros & Klemola 1999).

Ethnographic observation methods are characterised by a diversity of material and material acquisition methods. One problem is that, in order to obtain a reliable picture, the observation often has to continue for a long time. The research precisely monitors and records various work performances and there is an interest in objects and equipment. Ethnographic research does not, however, strive to change the subject being studied, but to describe it as precisely as possible (Engeström 1998).

The clinical method described by Schein (1992, 1999) is interested, instead of statistical regularities, in special cases, surprising solutions to surprising problems and other, for the researcher, unforeseen events. This requires the observation of everyday activity as well as the analysis of an organisation's miscellaneous daily problem-solving situations. The Schein method differs from ethnographic descriptive research in that it is always based on some concrete problem of the company to which a solution is sought (hence the name clinical method). Schein's method requires close cooperation with a representative of the company. The presence of an outsider is necessary because only someone who comes from outside the culture in question is able to understand and interpret the unconscious dynamics of operations and the underlying assumptions that prevail in the culture. Without assistance given from inside, however, the researcher/consultant is faced with too great a quantity of new issues, meanings and symbols, and is swamped with inessential data.

3.2.5 Seminars and working groups

Joint development seminars for all personnel are one way to work on matters relating to organisational culture, e.g. values and aspects of operations that require development. Compared with other methods, seminars have the advantage that, in them, it is possible to get a large section of the workforce to face the same issue at the same time. In group work individual differences are filtered out more easily than in interviews (Alasuutari 1994). In a seminar it is also possible to initiate development work and commit staff to active development work. An advantage of operational development seminars is that they maximise the exchange of experiences and opinions. At best this can strengthen the company culture and transmit tacit information. Discussion and joint action are the best

ways to create shared understanding and shared meaning (see e.g. Weick 1995). Seminars clarify the issues on which the company's staff have a common understanding and those in which opinions differ. At the same time it is also possible to study the reasons for differences of view and ponder further measures.

Schein (1999) proposes that a good way to clarify an organisation's underlying assumptions is to assemble a small core group and, together with a consultant, to ponder its views of the organisation's different activities. It is very important to determine at the start some concrete problem to which a solution can then be sought. The first stage is to identify the company's artefacts. It is good to ask young workers in particular about their experiences of coming to the company and about surprising observations. After the gathering of artefacts, the group determines the company's espoused values. These espoused values are compared with the artefacts and an attempt is made to find conflicts that would reveal something about the company's underlying assumptions. If necessary, the process is repeated with another group and the results compared. Generally, groups consist however of supervisors, so this method typically only yields information about one subculture. No scientific studies have been made as to the validity of the method. One reason for this is that the method does not include systematic documentation of the methodology and of the information obtained. Cox and Cheyne (2000) have used focus group discussions on assessing safety culture in offshore environments.

3.3 Summary

Three different objectives of safety and organisational culture studies can be distinguished: an attempt to describe a culture, an attempt to explain some of a culture's features and an attempt to assess a culture (see also Oedewald et al. 2001). All these objectives pose challenges. Organisational culture is a phenomenon that is difficult to measure, and the selection of criteria used to ascertain its effectiveness is not unambiguous.

Guldenmund (2000) proposes, in a survey of safety culture studies, that no statistically significant links have been found between a safety culture and the accidents that happen to personnel, even though such links have been assumed (cf. Lee 1998, however). Accident statistics are not a good indicator of safety culture, however, because they are always directed at past events, which have already changed the prevailing culture. Moreover, culture influences safety and operational efficiency over the long term. Long-term research into the impact of corporate culture on safety has not yet been done, however. Only the long-term monitoring (with no attempt to improve operations!) of

companies possessing a so-called bad safety culture would reveal any links. For understandable reasons, it has not been possible to conduct such research.

Another problem is that culture has not be surveyed deeply enough, or the focus has been on some subarea of culture (such as safety culture). The lack of statistical links raised by Guldenmund (2000) might result from the fact that the methods used do not measure culture, or that the wrong criteria of cultural effectiveness have been selected. Comparing the results of a safety culture indicator with e.g. accident statistics does not necessary provide proof of the validity of the indicator (see also Henttonen 2000).

In many safety questionnaires the questions are quite direct[3], and the answers may contain conscious and/or unconscious embellishment of facts. Conscious impression management and unconscious self-deception must always be taken into account when assessing information in questionnaire forms and interviews (Verkasalo 1996). Through conscious impression management an individual aims to create a positive image of him/herself, and it is at its height in situations in which anonymity is not guaranteed or when giving a positive image might be of some benefit to the individual concerned. Self-deception means maintaining a positive self-image, and it is less dependent on situation-specific factors. It is a tendency to raise one's self-esteem and to see oneself and one's group as slightly better than they are in reality (see Section 1.1). When comparing methods used to assess safety culture and organisational culture, one has to take into account the value-charged nature of the safety culture (Reiman 1999): for a good safety culture there exist certain norms and criteria which those being studied are also probably aware of. Self-deception and impression management are more powerful in such studies. A good aspect of questionnaire forms which are filled in anonymously is that particularly in value-charged matters, such as safety, management etc., the respondents have the opportunity to give anonymous criticism/feedback. This reduces so-called socially desirable answers (cf. Verkasalo 1996).

Methods used in the study of organisational culture can be divided into quantitative and qualitative methods. Qualitative and interactive methods are needed in order to be able to approach unconscious cultural material that is otherwise unattainable in everyday operations. Every organisation's culture is special and thus it requires non-standardised research methods in which the dimensions to be measured are not defined in advance (see e.g. Schein 1992, 1999). Where quantitative research is traditionally research based on deductive reasoning that tests a theory, qualitative research typically represents ideography and a research direction based on inductive reasoning. By this is meant that the research does not strive to find generalising theories but to study the research subject in natural conditions and to understand its uniqueness. Qualitative research is thus more

---

[3] For example: "In this company, we hesitate to report minor injuries and incidents." (Ostrom et al. 1993)

context-bound than quantitative research. No attempt is made to examine phenomena out of context; the objective is contextual understanding. Often a phenomenon that is a subject of interest for qualitative research is one in which the context is difficult or impossible to separate from the phenomenon itself. Culture is a good example of such a phenomenon (Denison 1990, Sackmann 1991).

The selection of methods depends on the practical problem of the company being studied and the research problem resulting from it. They determine how exact a picture of the culture needs to be obtained. By combining different methods and perspectives one can obtain as comprehensive a picture of the organisation's culture as is necessary. A mere description of the culture is not enough, however, if the aim is to develop operations.

Often organisational culture studies focus only on those characteristics of a culture which are most obvious and which maintain internal cohesion (e.g. values, attitudes, leadership). Traditional ethnographic organisational culture research does not directly take a view on a culture's "goodness" or "badness" (Grote & Künzler 2000, p. 135). In ethnographic organisational culture research it has therefore not been a tradition to identify those critical work demands around whose fulfilment the culture has been built. If one desires to assess an organisational culture as well as describe it, the central challenge is the definition of these criteria. When culture is assessed from a traditional consulting or management standpoint, the focus is generally on the criteria that maintain internal cohesion (such as a good working climate), or then criteria are created from general quality indicators (e.g. work accidents), from benchmarking against other companies, or on the basis of the theoretical literature (e.g. TQM programmes). In other words, a significant proportion of the criteria of "good" culture remains unclear. A new way of approach is required to assess culture and establish assessment criteria. In the next chapter we will present a model for combining a descriptive and explanatory understanding with an appropriate assessment of culture.

4. Contextual assessment of organisational culture

4.1 The organisation's core task and culture

The working practices and core-task research method developed in VTT's Human Factors team attempts to get closer to the actors themselves and to the subject of their work. The method is based on cultural-historical activity research (see e.g. Vygotsky 1978, Engeström 1998, 1999). Human activity is considered to be intentional, namely a striving for certain objectives as well as context-dependent, namely occurring in a certain technical and social environment.

By the core task is meant the essential content of some job or duty. The core task includes those operational demands that have to be fulfilled so that the objectives of the whole organisation can be achieved. The core-task concept and analytical approach have been developed in earlier VTT studies (Norros 1995, Norros & Klemola 1999, Hukki & Norros 1998, Norros & Nuutinen 1999, Reiman & Norros 2002, Norros & Nuutinen in press, see also Oedewald et al. 2001). The core-task concept combines Vicente's (1999) work domain analysis, activity theory (Engeström 1998, 1999) and pragmatic philosophy (Peirce 1903, Dewey 1929).

Core-task analysis studies and assesses work's essential content and its critical demands, how the demands manifest themselves in daily work, and what effect possible new content, for example pressures for change coming from the external operating environment, have on the core task. Good working practices enable the core task to be maintained. Working practices are partly based, however, on unconscious meanings and these are not actively reflected. Engeström (1998) emphasises the analysis of the historical development of the activity system and the object of the work in order to understand the present situation (Engeström 1998). Personnel's understandings of the core task are historically constructed. The history of the organisation is physically present in tools, practices and organisational structures. For example outdated tools can maintain a false image of the present core task (see e.g. Hutchins 1995, Engeström 1998, 1999). Changes in the operating environment and the new operational demands caused by them are thus not automatically reflected as changes in the personnel's understandings of their core task.

The core-task concept can also be used to sharpen the definition of organisational culture: organisational culture is defined as a solution created by the organisation for the demands set by the core task (see Reiman 2001b, Reiman & Norros 2002). Core-task analysis therefore serves as a tool for studying the general demands of the organisation's core task. It is the fulfilment of these demands that has given rise to the organisation's culture. As stated above, traditional ethnographic organisational culture

research does not take a stand on whether a culture is "good" or "bad", and in so-called evaluative cultural studies the criteria of a good culture are typically general and independent of context. The core-task concept combines the productivity, safety and well-being demands presented by Vicente (1999, see also Section 1.3) and determines the demands set for their fulfilment in each operating environment.

The core task is thus an analytical concept that allows the formulation of criteria for examining activities and assessing the impact of solutions. Core-task analysis facilitates the contextual assessment of culture. Cultural analysis is again needed in order to see retrospectively the significance of working practices unfavourable to the core task and to be able to propose suitable development methods for the culture. A culture's main characteristics are, among other things, such characteristics of the culture that serve internal integration and which no longer serve the core task (or serve it in a different way than was originally intended) because

a) the core task has changed

b) some function of the cultural has assumed a ritual form, whereby its original purpose of fulfilling external adaptation changes to serving internal integration.

In addition, a culture may have cultural characteristics that originally served external adaptation and which have remained, even though the core task has changed. These routines can no longer be called into question, even though they have no meaning. An organisation has to be able to abandon working practices and routines that have started to weaken working capacity. These routines may, however, have other functions (e.g. ritual planning meetings that maintain internal morale by assuring that the situation is under control). For this reason, changing them without clarifying their significance may be detrimental in terms of the organisation's overall operations.

4.2 Basic concepts of research methodology

The VTT's Human Factors team has developed the Contextual Assessment of Organisational Culture (CAOC) methodology (see Reiman 2001a, 2001b, Reiman & Norros 2001, 2002). The methodology combines organisational culture concepts (Schein 1992, Weick 1995) with core-task analysis and strives by this means to determine on a case-by-case basis those criteria by which the culture of the organisation in question can be assessed. The demand model created by core-task analysis acts as a point of comparison when examining the key features of a culture. Thus one is able to distinguish characteristics that serve the core task of the culture from other characteristics of the culture and to assess the impact of different changes on the organisation's effectiveness. Working practices are built on meanings (Norros in

preparation). Owing to this, it is difficult to change working practices before clarifying their meanings and the dynamics connected with their formation. Core-task analysis combined with cultural research offers personnel an opportunity to see their work and their whole organisation in a new light. They create new meanings and shape the old ones.

Figure 3 presents the key concepts of the methodology. The group that founds the organisation defines its core task. This definition is influenced by the field in which it operates. The definition of the core task sets the boundaries within whose framework the group begins to build a common culture. The culture is the solution formulated by the group for the demands set by the core task, in order to survive in the operating environment. In the figure, the environment and the company (the culture) have been separated for the sake of clarity, even though the system in question is a highly interactive one.
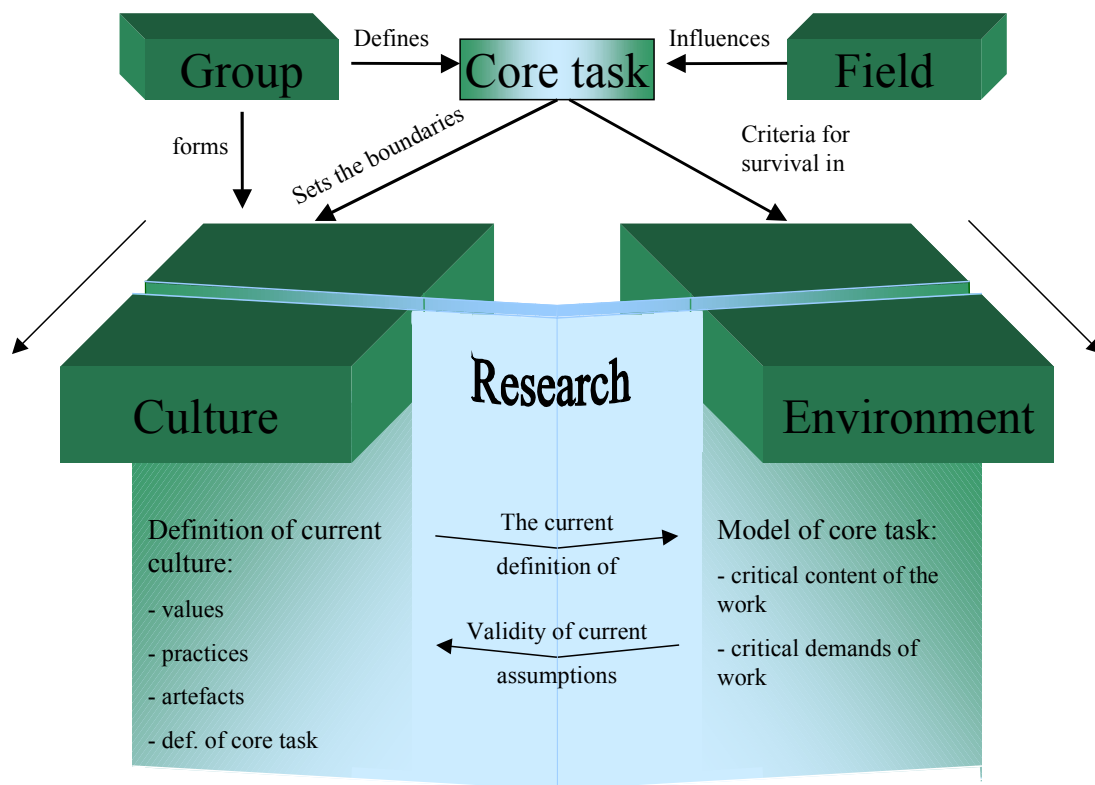

Figure 3. Core concepts and the relationships between them.

According to Figure 3 the objective of the research is simultaneously to determine the company's core task at a given time, taking into account the demands of the environment, and to map out the key characteristics of the culture, utilising both quantitative and qualitative methods. The defined core task can be compared with the culture's key characteristics and in this way their relevance in fulfilling the demands of the core task can be assessed.

4.3 Practical application of the methodology

The following data acquisition methods are used in implementing a research and development project according to the methodology:

- document analysis

- group working

- interviews of representatives of the organisation's different levels

- organisational culture questionnaire

- observation of activities

- activity development seminars

Familiarisation with the organisation begins with an analysis of key documents and interviews at the supervisor level. Document analysis gives a picture of the main recorded artefacts, such as the organisational structure, the organisation of duties and espoused values. Supervisor interviews are used to obtain a picture of those practical problems that they hope the research will solve.

For core-task analysis an outline is needed of the characteristic features that influence work activity, the objectives of the work and the available resources. Core-task analyses have been performed by VTT in different contexts. The analytical method and the data acquisition methods have varied according to the subject area. In earlier studies in which the core-task concept has been utilised (see e.g. Norros & Klemola 1999, Hukki & Norros 1998, Norros & Nuutinen 1999), the perspective has often been the nature of an individual's (e.g. nuclear power plant controller, anaesthetist) expertise and daily working practices. The core-task concept has been used in these cases differently than in cultural research. In cultural research the objective is the determination of the core task at the level of the organisation's operational groups. The focus shifts away from the modelling of actual situations to the modelling of the general conditions of activity e.g. through group working and interviews. In earlier studies, both of these have been done. In terms of operational development it is, however, important to examine working practices as communal phenomena.

Group working with the company's experts is applied to the modelling of the core task and to formulating and testing hypotheses relating to culture. Further objectives of group working are the creation of common (researcher / subject area expert) concepts as well as, at the analysis stage, the testing of observations made by the researchers and the search for interpretations. In the working group, the interpretations proposed for observations tell about the underlying assumptions. Group working is also an important

part of the method's practical contribution to the company; it strives to offer personnel the tools to continue reflecting on the core task and working practices also in the future.

Interviews serve many different purposes in the cultural assessment process. Firstly, the interviewing of individuals working at different organisational levels and posts gives researchers an understanding of different job descriptions, language and concepts. In this respect the interviewees are informants. Secondly, semi-structured interviews are used to obtain systematically gathered views, which are needed, for example, to form a cumulative view in the modelling of the core task. Thirdly, interviews provide an opportunity for material-oriented theming, which can be utilised at different stages. When preparing a questionnaire, one can consider, for example, how themes often emphasised in the interviews would appear in values and practices measured by the questionnaire and what they tell about the demands of the core task. Interview material can also be classified into types to find differences in answers relating to certain questions and themes. Themes and types can be used to formulate hypotheses and to guide the analysis of questionnaire material. Interviews also enable the interpretation of statistical links found in the content of the questionnaire material. They give them meaning, for example, in respect of the connection in which a matter has been brought up, what kind of emotional charge is connected with it and whether the matter as been brought up spontaneously or through questioning. Interviews also make statistical results more concrete by providing examples of the phenomena in question.

The purpose of an organisational culture questionnaire is to produce a comprehensive picture of the prevailing values in an organisation and of the views of the personnel (e.g. about the significance of their own work, the feedback they receive, and their opportunities to influence the content and quality of their work). A questionnaire is also the element that measures the demands of the core task, and this element can be tailored for each company in turn on the basis of, for example, group working (see e.g. Reiman & Oedewald in preparation).

Observing an organisation's activities gives a more detailed picture of work demands and observations of the expression of culture in everyday work. The observation of activities focuses on a limited number of tasks and the objective may be, based on the results of earlier stages of the research and observation, to present development proposals and to test their effectiveness in the tasks in question. By observing activities it is also possible to find new kinds of core-task demands which it was not possible to uncover by conceptual modelling owing to their situation-specific or self-evident nature (see e.g. Norros & Nuutinen 1999, Norros & Klemola 1999, Reiman & Norros 2002, Norros & Nuutinen accepted for publication).

5. Summary

This report examined the assessment and development of organisational culture in complex organisations. It covers definitions of organisational culture and safety culture, and the research that has been conducted. The definition of organisational culture (Schein 1992) was adjusted with the aid of the core-task concept. Organisational culture was defined as a solution created by an organisation for the demands set by the core task (see Reiman 2001b, Reiman & Norros 2002).

The development of an organisation's operations requires an understanding of the overall dynamics (culture) of the organisation's activities, but also an assessment of the impact of culture on operational efficiency. However, no universal criteria of organisations' operational efficiency exist. They must be determined on a case-by-case basis. Only then can a position be taken on the appropriateness of the culture.

The methodology proposed in the report uses both qualitative and quantitative methods. Determining the culture prevailing in a company at some moment in time requires the study of the company's values, practices, artefacts and of the core task defined by them. By comparing these elements an attempt is made to clarify the underlying assumptions prevailing in a company. Core-task analysis, on the other hand, helps to determine the main content of work and the critical demands it sets for working practices. These are not independent stages; they happen in parallel, exploiting the same research methods.

The research requires close cooperation with target groups and covers both the practical problems and the resulting research problems which one strives to resolve. One aim is to commit personnel to ponder and reflect on their own work and in this way to reduce opposition to change and to create the conditions for the continuation of internal development work also after the research is completed. Operational development seminars organised during the research deepen the researchers' picture of the culture and act at the same time as a practical channel for operational development and as a chance for personnel to exert their influence.

The Contextual Assessment of Organisational Culture (CAOC) methodology has been developed particularly for application in improving the efficiency of complex organisations and communities of practice (see Lave & Wenger 1991), in other words to improve productivity, safety and well-being (see Vicente 1999). The methodology has been applied, among other things, in developing regulatory culture and maintenance activities. Separate reports have been written about these case studies and these go through in more detail the application of the methodology applied in the cases in question (see Reiman & Norros 2002, Reiman & Oedewald in preparation). The purpose of this report was to present the general basis of the methodology and its relationship to other organisational research and development.

References

ACSNI. (1993). Organising for Safety. Health and Safety Commission. Advisory Committee on the Safety of Nuclear Installations (ACSNI). HMSO, London.

Alasuutari, P. (1994). Laadullinen tutkimus. Tampere: Vastapaino. [In Finnish]

Alvesson, M. & Berg, P.O. (1992). Corporate Culture and Organizational Symbolism. Berlin: Walter de Gruyter.

Burrell, G. & Morgan, G. (1979). Sociological Paradigms and Organizational Analysis. London: Heinemann.

Cameron, K.S. & Quinn, R.E. (1999). Diagnosing and Changing Organisational Culture: Based on the Competing Values Framework. Massachusetts: Addison-Wesley.

Collins, D. (1998). Organizational Change: Sociological Perspectives. London: Routledge.

Cooper, D. (1998). Improving Safety Culture. A Practical Guide. Chichester: John Wiley & Sons.

Cox, S.J. & Cheyne, A.J.T. (2000). Assessing Safety Culture in Offshore Environments. Safety Science 34, 111–129.

Cox, S. & Flin, R. (1998). Safety Culture: Philosopher's Stone or Man of Straw? Work and Stress, Vol. 12, No. 3, 189–201.

Deal, T. & Kennedy, A. (1982). Corporate Cultures. Harmondsworth: Penguin Books.

Denison, D. (1990). Corporate Culture and Organizational Effectiveness. New York: John Wiley.

Dewey, J. (1929/1999). The Quest for Certainty. A Study of the Relation of Knowledge and Action. Finnish translation. Helsinki: Gaudeamus.

Engeström, Y. (1998). Kehittävä työntutkimus. Perusteita, tuloksia ja haasteita. Helsinki: Edita. [In Finnish]

Engeström, Y. (1999). Activity Theory and Individual and Social Transformation. In: Engeström, Y., Miettinen, R. & Punamäki, R-L. (eds.). Perspectives in Activity Theory. Cambridge: Cambridge University Press.

Flin, R., Mearns, K., O'Connor, P. & Bryden, R. (2000). Measuring Safety Climate: Identifying the Common Features. Safety Science 34, 177–192.

Gagliardi, P. (1986). The Creation and Change of Organizational Cultures: A Conceptual Framework. Organization Studies 7/2, 117–134.

Giddens, A. (1984). The Constitution of Society: Outline of the Theory of Structure. Berkeley, CA: University of California Press.

Glendon, A.I. & Stanton, N.A. (2000). Perspectives on Safety Culture. Safety Science 34, 193–214.

Goffman, E. (1959). The Presentation of Self in Everyday Life. New York: Doubleday.

Grote, G. & Künzler, C. (2000). Diagnosis of Safety Culture in Safety Management Audits. Safety Science 34, 131–150.

Guldenmund, F.W. (2000). The Nature of Safety Culture: a Review of Theory and Research. Safety Science 34, 215–257.

Hammar, L., Wahlström, B. & Kettunen, J. (2000). Syn på säkerhetskultur vid svenska och finska kärnkraftverk. NKS-14. [in Swedish]

Harrison, C. (1996). Safety Culture. In: Van Steen, J. (ed.). Safety Performance Measurement. Iso-Britannia, Institution of Chemical Engineers.

Hatch, M.J. (1993). The Dynamics of Organizational Culture. Academy of Management Review, Vol. 18, No. 4, pp. 657–693.

Helkama, K., Myllyniemi, R. & Liebkind, K. (1998). Johdatus sosiaalipsykologiaan. Helsinki: Edita. [In Finnish]

Henttonen, T. (2000). Turvallisuuden mittaaminen. TUKES-julkaisu 7/2000. Turvatekniikan keskus, Helsinki. [In Finnish]

Hogg, M.A. & Abrams, D. (1988). Social Identifications. A Social Psychology of Intergroup relations and Group Processes. London: Routledge.

HSE, (1997). Successful Health and Safety Management. Health and Safety Executive. London, HMSO.

Hukki, K. & Norros, L. (1998). Subject-Centered and Systemic Conceptualization as a Tool of Simulator Training. Le Travail Humain, 313–331.

Hutchins, E. (1995). Cognition in the Wild. Massachusetts: MIT press.

IAEA, Safety Series No. 75-INSAG-4. (1991). Safety Culture. Vienna: International Atomic Energy Agency.

IAEA, TECDOC-743. (1994). ASCOT Guidelines. Guidelines for Organizational Self-Assessment of Safety Culture and for Reviews by the Assessment of Safety Culture in Organizations Team. Vienna: International Atomic Energy Agency.

IAEA, TECDOC-860. (1996). ASCOT Guidelines. Revised 1996 Edition. Guidelines for Organizational Self-Assessment of Safety Culture and for Reviews by the Assessment of Safety Culture in Organizations Team. Vienna: International Atomic Energy Agency.

IAEA, Safety Report. (1997a). Examples of Safety Culture Practices. Vienna: International Atomic Energy Agency.

IAEA, TECDOC-942. (1997b). Organizational Factors Influencing Human Performance in Nuclear Power Plants. Vienna: International Atomic Energy Agency.

IAEA, TECDOC-954. (1997c). Procedures for Self-Assessment of Operational Safety. Vienna: International Atomic Energy Agency.

IAEA, Safety Report. (1998). Developing Safety Culture. Practical Suggestions to Assist Progress. Vienna: International Atomic Energy Agency.

Ignatov, M. (1999). Implicit social norms in reactor control rooms. In: Misumi, J., Wilpert, B. & Miller, R. (eds.). Nuclear Safety: A Human Factors Perspective. London: Taylor & Francis.

Jacobs, R. & Haber, S. (1994). Organizational processes and nuclear power plant safety. Reliability Engineering and Systems Safety 45, 75–83.

Juuti, P. (1997). Yrityskulttuurin murros. Tampere: Tammer-Paino. [In Finnish]

KSA. Swiss Federal Nuclear Safety Commission. (1997). Safety Culture in a Nuclear Ins-tal-la-tion. Reflections on its Assesment and Promotion. KSA 7/75E Wurenlingen.

Kunda, G. (1992). Engineering Culture: Control and Commitment in a High-Tech Corporation. Philadelphia: Temple University Press.

Lave, J. & Wenger, E. (1991). Situated learning, legitimate peripheral participation. New York: Cambridge University Press.

Lee, T. (1997). Assessing and Improving the Health of a Safety Culture. IEEE Sixth Conference on Human Factors and Power Plants. Orlando, Florida. June 8–12,1997.

Lee, T. (1998). Assessment of Safety Culture at a Nuclear Reprocessing Plant. Work & Stress, Vol. 12, No. 3, pp. 217–237.

Levi, D. (2001). Group Dynamics for Teams. Thousand Oaks: Sage.

Lewin, K. (1947). Group Decision and Social Change. In: T. Newcomb & E. Hartley (eds.). Readings in Social Psychology. New York: Holt, Rinehart & Winston. Pp. 330–344.

McDonald, N., Corrigan, S., Daly, C. & Cromie, S. (2000). Safety Management Systems and Safety Culture in Aircraft Maintenance Organisations. Safety Science 34, 151–176.

Moran, E.T. & Volkwein, J.F. (1992). The Cultural Approach to the Formation of Organizational Climate. Human Relations, Vol. 25, No. 1, pp. 19–47.

Norros, L. (1995). An orientation-based approach to expertise. In: Hoc, J.-M., Cacciabue, P.C. & Hollnagel, E. (Eds.). Expertise and technology: Cognition and human-computer cooperation. Hilsdale, NJ: Lawrence Erlbaum Associates. Pp. 141–164.

Norros, L. (in preparation). Acting under uncertainty. Book manuscript.

Norros, L., Hukki, K., Haapio, A. & Hellevaara, M. (1998). Päätöksenteko komento-sillalla luotsaustilanteessa. VTT Julkaisuja – Publikationer 833. Espoo: Valtion teknilli-nen tutkimuskeskus. [In Finnish]

Norros, L. & Klemola, U.-M. (1999). Methodological considerations in analyzing anaesthetists' habit of action. Ergonomics, Vol. 42, No. 11, pp. 1521–1530.

Norros, L. & Nuutinen, M. (1999). Development of an approach to analysis of air traffic controllers' working practices. Human Error, Safety and System Development. Liege, BE, 7–8 June 1999. 23 p.

Norros, L. & Nuutinen, M. (in press). The core-task concept as a tool to analyse working practices. In: Borham, N., Samurcay, R. & Fischer, M. (eds.). Work Process Knowledge. Francis & Taylor.

NRC. (1998). Nuclear Regulatory Commission. Office of the Inspector General. NRC Safety Culture and Climate Survey. Executive Summary. June 1998. http://www.nrc.gov/NRC/OIG/SURVEY/index.html. 20.7.1998.

Oedewald, P. (2001). Kunnossapidon inhimillisten virheiden seulonta- ja analyysimenettelyn tarkastelua käyttäytymistieteellisestä näkökulmasta. TAU A005. Työraportti. [In Finnish]

Oedewald, P., Reiman, T., Nikkinen, S. & Nuutinen, M. (2001). Inhimilliset tekijät kunnossapidossa. Kirjallisuuskatsaus. TAU B014. Julkinen raportti. [In Finnish]

Ostrom, L., Wilhelmsen, C. & Kaplan, B. (1993). Assessing Safety Culture. Nuclear Safety, 2. April–June.

Ouchi, W.G. (1981). Theory Z: How American Business Can Meet the Japanese Challenge. Reading, MA: Addison-Wesley.

Parker, M. (2000). Organizational Culture and Identity. London: Sage.

Parsons, T. (1951). The Social System. New York: Free Press.

Peirce, C.S. (1903/1998). The Harvard Lectures on Pragmatism. The Essential Peirce. Selected Philosophical writings. Volume 2. Bloomington: Indiana University Press.

Pettigrew, A. (1979). On Studying Organisational Cultures. Administrative Science Quarterly, Vol. 24, No. 4, pp. 570–581.

Quinn, R.E. & Rohrbaugh, J. (1983). A Spatial Model of Effectiveness Criteria: Toward a Competing Values Approach to Organizational Analysis. Management Science, Vol. 29, No. 3, pp. 363–377.

Quinn, R.E. (1988). Beyond Rational Management. San Francisco: Jossey-Bass.

Rasmussen, J. (1995). Covering Paradigms of Human Sciences. Swedish Centre for Risk Research and Education, 1995-04-18.

Reason, J. (1993). Managing the Management Risk: New Approaches to Organisational Safety. In: Wilpert, B. & Quale, T. (eds.). Reliability and Safety in Hazardous Work Systems. Hove: Lawrence Erlbaum.

Reason, J. (1997). Managing the Risks of Organizational Accidents. Aldershot: Ashgate.

Reiman, T. (1999). Organisaatiokulttuuri ja turvallisuus – kirjallisuuskatsaus. VTT Tiedotteita – Meddelanden – Research Notes 2009. Espoo: Valtion teknillinen tutkimuskeskus. [In Finnish]

Reiman, T. (2001a). Organisaatiokulttuuri Säteilyturvakeskuksen Ydinvoimalaitosten valvonta -osastolla. VTT Julkaisuja – Publikationer 853. Espoo: Valtion teknillinen tutkimuskeskus. [In Finnish]

Reiman, T. (2001b). Katsaus turvallisuuskulttuurin arviointimenetelmiin ja tehtyihin tutkimuksiin. TAU B013. Julkinen raportti. [In Finnish]

Reiman, T. & Norros, L. (2001). Organisationskulturen inom den finländska Strålsäkerhetscentralens (STUK) avdelning för övervakning av kärnkraftverk. NKS-29. ISBN: 87-7893-080-4. [In Swedish]

Reiman, T. & Norros, L. (2002). Regulatory Culture: Balancing the Different Demands of Regulatory Practice in the Nuclear Industry. In Hale, A.R., Hopkins, A. & Kirwan, B. (eds.). Changing Regulation – Controlling Hazards in Society. Oxford: Pergamon.

Reiman, T. & Oedewald, P. (in preparation). Survey study on maintenance culture.

Rochlin, G.I. (1999). Safe Operation as a Social Construct. Ergonomics, 42 (11), 1549–1560.

Rousseau, D.M. (1990). Assessing Organisational Culture: The Case for Multiple Methods. In: Schneider, B. (ed.). Organisational Climate and Culture. San Francisco: Jossey-Bass.

Ruuhilehto, K. & Vilppola, K. (2000). Turvallisuuskulttuuri ja turvallisuuden edistäminen yrityksissä. TUKES-julkaisu 1/2000. Turvatekniikan keskus, Helsinki. [In Finnish]

Sackmann, S.A. (1991). Uncovering Culture in Organizations. Journal of Applied Behavioral Science, Vol. 27, No. 3, pp. 295–317.

Schein, E.H. (1981). Does Japanese Management Style Have a Message for American Managers? Sloan Management Review, Fall 1981.

Schein, E.H. (1985). Organizational Culture and Leadership. San Francisco: Jossey-Bass.

Schein, E.H. (1992). Organizational Culture and Leadership (2nd ed.). San Francisco: Jossey-Bass.

Schein, E.H. (1999). The Corporate Culture Survival Guide: Sense and Nonsense about Culture Change. San Francisco: Jossey-Bass.

Schumacher, T. (1997). West Coast Camelot. The Rise and Fall of an Organizational Culture. In: Sackmann, S.A. (ed.). Cultural Complexity in Organizations. Inherent Contrasts and Contradictions. Thousand Oaks: Sage.

Smircich, L. (1983). Concepts of Culture and Organizational analysis. Administrative Science Quarterly, 28, 339–358.

Verkasalo, M. (1996). Values – Desired or Desirable. Helsinki: Hakapaino.

Vicente, K. (1999). Cognitive Work Analysis. Toward Safe, Productive, and Healthy Computer-Based Work. LEA, London.

Vygotsky, L.S. (1978). Mind in Society. Cambridge: Harvard University Press.

Weick, K.E. (1987). Organizational Culture as a Source of High Reliability. California Management Review, 2, 133–127.

Weick, K.E. (1993). Sensemaking in organizations: Small Structures with Large Consequences. In Murnigham, J.K. (ed.), Social Psychology in Organizations: Advances in Theory and Research. Englewood Cliffs, NJ: Prentice-Hall.

Weick. K.E. (1995). Sensemaking in Organizations. Thousand Oaks, CA: Sage Publications.

Zohar, D. (1980). Safety Climate in Industrial Organizations: Theoretical and Applied Implications. Journal of Applied Psychology 65, 96–102.

Author(s)
Reiman, Teemu & Oedewald, Pia

Title
The assessment of organisational culture
A methodological study

Abstract

This report examines the assessment and development of organisational culture in complex organisations. It covers definitions of organisational culture and safety culture, and the research that has been conducted. The common definition of organisational culture is adjusted with the aid of the core-task concept. Organisational culture is defined as a solution created by an organisation for the demands set by the core task. The development of an organisation's operations requires an understanding of the overall dynamics (culture) of the organisation's activities, but also an assessment of the impact of culture on operational efficiency. The criteria of organisations' operational efficiency must be determined on a case-by-case basis. The Contextual Assessment of Organisational Culture (CAOC) methodology proposed in the report uses both qualitative and quantitative methods. Determining the culture prevailing in a company at some moment in time requires the study of the company's values, practices, artefacts and of the core task defined by them. By comparing these elements an attempt is made to clarify the underlying assumptions prevailing in a company. Core-task analysis, on the other hand, helps to determine the main content of work and the critical demands it sets for working practices. The research requires close cooperation with target groups and covers both the practical problems and the resulting research problems which one strives to resolve. One aim is to commit personnel to ponder and reflect on their own work and in this way to reduce opposition to change and to create the conditions for the continuation of internal development work also after the research is completed. Operational development seminars organised during the research deepen the researchers' picture of the culture and act at the same time as a practical channel for operational development and as a chance for personnel to exert their influence. methodology has been developed particularly for application in improving the efficiency of complex organisations and communities of practice, in other words to improve productivity, safety and well-being. The purpose of this report is to present the general basis of the methodology and its relationship to other organisational research and development.

VTT TIEDOTTEITA A 2140

The Assessment of organisational culture. A methodological study

VTT TIEDOTTEITA – RESEARCH NOTES

VTT TUOTTEET JA TUOTANTO – VTT INDUSTRIELLA SYSTEM – VTT INDUSTRIAL SYSTEMS

1993 Järvenpää, Jorma & Vanhala, Markku. Huoltotyö raskaiden ylösnostettujen ohjaamoiden ja konepeittojen alla. 1999. 57 s. + liitt. 2 s.

2006 Graeffe, Jussi, Saari, Heikki, Salminen, Arto. Survey on space applications of Finnish micro/nano technologies. 1999. 42 p.

2009 Reiman, Teemu. Organisaatiokulttuuri ja turvallisuus. Kirjallisuuskatsaus. 1999. 46 s. + liitt. 2 s.

2015 Wahlström, Björn & Kettunen, Jari. An international benchmark on safety review practices at nuclear power plants. 2000. 54 p. + app. 19 p.

2017 Varpula, Timo. Optimising planar inductors. 2000. 30 p.

2022 Malm, Timo & Kivipuro, Maarit. Safety validation of comples components – Validation by analysis. 43 p. + app. 4 p.

2031 Tommila, Teemu, Jakobsson, Stefan, Ventä, Olli, Wahlström, Björn & Wolski, Antoni. Ydinvoimaloiden uudet tietojärjestelmät. Sovellusalueen analyysista käyttäjän vaatimuksiin. 2000. 152 s. + liitt. 22 s.

2035 Hyötyläinen, Raimo & Karvonen, Iris. Häiriönseurannan organisointi- ja analysointimenetelmät. 2000. 91 s. + liitt. 5 s.

2036 Parikka, Risto, Mäkelä, Kimmo K., Sarsama, Janne & Virolainen, Kimmo. Hihnakuljettimien käytön turvallisuuden ja luotettavuuden parantaminen. 2000. 77 s. + liitt. 24 s.

2044 Karvonen, Iris. Management of one-of-a-kind manufacturing projects in a distributed environment. 2000. 54 p.

2050 Kotikunnas, Erkki & Heino, Perttu. Turvallisen prosessilaitoksen suunnittelu. STOPHAZ-projektissa syntyneet työkalut. 2000. 44 s.

2058 Konola, Jari. Kunnossapidon tietojärjestelmä käyttövarmuustiedon lähteenä Suomen paperi- ja selluteollisuudessa. 2000. 25 s.

2061 Välisalo, Tero & Rouhiainen, Veikko. Luotettavuusjohtaminen työkoneteollisuudessa. 2000. 43 s. + liitt. 15 s.

2066 Harju, Hannu. Ohjelmiston luotettavuuden kvalitatiivinen arviointi. 2000. 111 s.

2067 Baumont, Geneviève, Wahlström, Björn, Solá, Rosario, Williams, Jeremy, Frischknecht, Albert, Wilpert, Bernhard & Rollenhagen, Carl. Organisational factors. Their definition and influence on nuclear safety. Final raport. 2000. 65 p.

2115 Luoma, Tuija, Mattila, Inga, Nurmi, Salme, Ilmén, Raija, Heikkilä, Pirjo, Salonen, Riitta, Sikiö, Teija, Lehtonen, Mari & Anttonen, Hannu. Elektroniikka- ja kemianteollisuuden suojavaatteet. Sähköstaattiset ominaisuudet ja käyttömukavuus. 2001. 92 s. + liitt. 12 s.

2117 Malm, Timo, Hämäläinen, Vesa & Kivipuro, Maarit. Paperiteollisuuden rullankäsittelyn turvallisuus ja luotettavuus. 2001. 68 s. + liitt. 12 s.

2140 Reiman, Teemu & Oedewald, Pia. The assessment of organisational culture. A methodological study. 2002. 39 p.