

Certification of persons in environmental sample taking in Finland

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Background

The expansion of environmental research to incorporate a greater amount of sectors, and the considerable increase in the amount of sectors has increased the requirement for detailed planning in quality assurance and for the finding of a reliable solution to this development. The initial quality thinking now includes all the stages of research (Figure 1). Out of all the stages looked at, labo-

ratory operations are relatively the least difficult to solve due to the fact that they have the greater amount of experience collected over a greater amount of time. An example of this is how the established high level of laboratory results. The question is now do we reliably organise the remaining stages of the research and achieve quality assurance. In question is sample taking and, on the other hand, research planning and the level of quality assurance of the reporting activity.

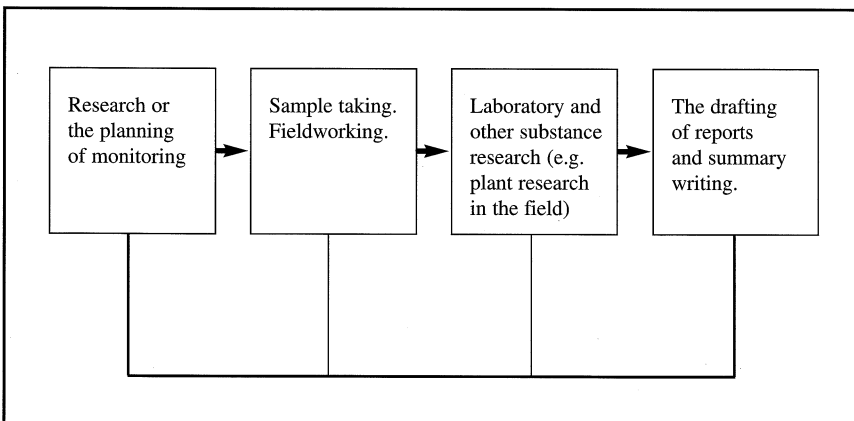


Figure 1. The central stages of environmental research.

Environmental research in Finland developed to a larger scale in the 1960s with earlier years being under the legislation of the water statute and the water protection management organisation. In a couple of years a regional administration for water protection was established. This regional authority began a national monitoring of the condition of the waters. Officials had, at their disposal, fourteen standard laboratories capable of performing water analysis. The law covering water also obligated water polluters to acquire, at their own cost, information on their own waste water or other operations producing change to what extent the impact of the relevant waste has on the recipient water.

Several engineering offices and other private research units established laboratories and proceeded to carry out commercial operations associated with water research, under the initiative of the authorities in the so called «Public Control of Water Research Institutes» organisational statute. Applications received, from laboratories from the various sectors, indicated that the laboratory staff met the criteria for levels of competence in working in their respective fields, and the laboratory equipment also met the criteria set out for such water research. At the start, attention was directed towards laboratories using expert water researchers and limnologists. For example, the requirement for chemists came several years later. The importance of water sample taking was stressed, but no particular demands were imposed, e.g. the

competence level of sample taking persons was not an issue.

Public control of these units focussed mainly on laboratory operations although over time fieldwork was also monitored. Water management's own internal education program also comprised of an annual course on water sample taking.

Development of environmental management also brought about many renewal projects. In the early 1990s efforts were also made to concentrate on targets for a complete quality system, incorporating environmental research working. After a lengthy process, as expected from a publicly managed working group, in the closing years of the 90s the ministry for the environment obligated the Finnish Environment Institute to establish an environmental sample taker quality assurance framework based on the certification of relevant persons.

Further to this, the procedure necessitated an urgent drafting of a new environmental protection law. On March 1. 2001 there came into force a new environmental protection law which also now determined quality assurance in measuring and research (108 §). According to this, the implementation of this law requires measuring, testing, descriptions and research, which must conform to the respective levels of competence, as well as be reliable and according to the appropriate method. The details of these requirements are regulated by the Ministry of the Environment's relevant statutes. This statute is prepared by the Ministry of the Environment. Quality assurance in environmental

sample taking is achieved in an accredited certification of relevant persons.

The basis of the certification of persons engaging in environmental sample taking

Quality improvement in environmental research and monitoring is covered by the Finnish Environment Institutes' established system for certification of persons engaging in environmental sample taking. This offers the possibility to ensure that all applicants conform to the required relative levels of competence in environmental sample taking, as well as environmental measuring and in observing.

Certification actions are in accordance with the standard SFS-EN 45013 (General requirements for certification bodies and certification of persons). The certification system comprises of its own board of certification, which from the point of view of environmental research represents the central interest. Defined are the operating requirements, of the board of certification, for the certification of persons and it supervises the actions of the certifying system for the certification of persons engaging in environmental sample taking, and its international validity and possible reciprocity, is in the agreed decision on operational competence of certification bodies and is to be guaranteed with the aid of accreditation (Finas S24/1994; preferred standard SFS-EN 45013 Accreditation Fulfilment). The

board of certification body has agreed on the provisions for awarding certificates of competence on 20.11.1998. The provisions have been changed on 27.2.2001 and the new provisions came into force 1.3.2001.

In accordance with the certification system, the certificate of competence is solely awarded by certification bodies of the Finnish Environmental Institute. The board of certification determines the general principles and the approved basis for the awarding of the certification of competence for applicants (The working procedures of the Finnish Environmental Institute: Chapter 6, items 6.7).

The Finnish Environmental Institute has appointed the current certification body on the 21.12.2000 and it appointed as Chairman limnologist Pertti Heinonen (pertti.heinonen@vyh.fi). Secretary to the certification body is appointed as International Affairs Secretary Tuula Liljander (tuula.liljander@vyh.fi).

The current controlling and monitoring board of certification was established at the same time 21.12.2000. The Chairman was appointed as Department Manager Pauli Kleemola (pauli.kleemola@vyh.fi) of the Finnish Environmental Institute and Secretary to the board as Manager Pertti Heinonen (pertti.heinonen@vyh.fi).

The environmental sample taking certification system enables the possibility to assess and ascertain the level of professional competence of environmental sample takers on an objective scale. Also to a certain extent, it confirms the degree of environmental

knowledge and understanding throughout the entire chain on a quality basis. Certification activities also include a voluntary quality assurance system.

This certification system offers the real possibility to confirm the level of professional acumen of environmental sample taker candidates, as well as environmental measuring and in observing. Competence in this circumstance refers to, the degree of which candidates comprehend the set general quality requirements and that he or she has acquired the practice of operating under the set preconditions and is aware of the important defined special abilities and skills in the agreed requirements. Candidates may confirm that they conform to the required levels of competence in either one or several special fields. Special competency fields include:

- water and water samples,
- samples of earth or solid waste,
- gas samples,
- biota samples and
- environmental measuring and observing.

Requirements for the decision of certification

On the 27.2.2001 the board of certification decided on the requirements covering the decision of certification in environmental sample taking, environmental measuring and observing. In accordance with the requirements established for making a decision of certification in environmental sample taking, the prerequisites include requirements of conformity to relevant skill levels and levels of knowledge in the relevant field. These are as follows:

The prerequisites of conformity of relevant skill levels is a suitable level of experience acquired in the candidates own main field or in other regular environmental sample taking or environmental measuring or in observing. This is over a period of no less than two years over a five year period going back from the time of examination. A precondition of each candidate is that he or she has worked for a period of no less than one full year in his or her main field in order for the candidate to confirm his or her conformity to the required level of professional competence. Should the candidate wish to confirm his or her conformity to the required levels of competence in two or more fields, then the candidate must have worked for no less than one full year in each special field in question. Examiners are to be approved by the certification body and must conform to all the requirements laid down covering the requirements of examiners. The employer of each candidate is to certify that each candidate fully conforms to all the requirements set out above in environmental sample taking or environmental measuring or in observing. The employer is also to attach certification covering the professional competence of the examiner.

Prerequisites of conformity to relevant knowledge requirements are that each applicant has successfully completed a certification board approved basic course. The application is to include notification that the applicant has successfully completed a course in a relevant special field, as well as details of the successful completion of the relative interviews associated with

this course. The duration of each single or several parts of such basic courses is to be no less than 20 hours. The duration of special field courses is to be no less than 10 hours, whenever the course covers competence in one special field. Should the applicant desire to confirm his or her competence in two or more special fields then he or she is to successfully complete the relative course in each respective special field.

Knowledge requirements can be seen as fulfilled also when the applicant has successfully completed courses approved by the board of certification. And where the duration of each course is no less than 30 hours, and that it is designed for a restricted target group, which conforms to the set requirements for such and which conform to the aforementioned content. In such circumstances this type of course is to include no less than 10 hours of education on one relative special field. Each applicant is to successfully complete interviews and performance examinations relating to each approved course, which are to include questions both on the relative parts of the course and on the special competencies required in the relative field. The purpose of these requirements is to ensure conformity to competency demands in each special field, and that the relative dedicated education in the courses has provided.

The awarding of certificates

Certification of competency is to be applied for by the certification body by recorded delivery from the Finnish Environment Institute. Application

forms are available from certification bodies and these can be photocopies. Applications are to define knowledge and ability.

Validity of the certification of competence

The certification of competence is valid for a period of five years. Should the certificant have accomplished no less than half the duration of the certification of competency in his or her main field of expertise, or in other regular work in environmental sample taking or environmental measuring or in observation, as well as attended a certification body approved education to upgrade the level of knowledge, and that he or she has managed sample taking expertly and without cause for complaint (see the section on certificant responsibility and obligations) then the certification body is authorised to extend the certification of competency for a further five years.

Education to upgrade knowledge must be certified and include no less than 30 hours or in other words one day per year. This education is to include teaching in general sample taking as well as in the special field noted in the certification of competence. If the applicant wishes to demonstrate his or her competence in another special field, other than that specified in the certification of competency, then he or she is to successfully complete a course relative to the respective special field. The duration of this course is to be no less than (10 hours) and related examinations.

Separate, anticipated approvals in education in upgrading knowledge

need not be applied for. The quality of such education and sufficiency are approved by the certification body on the basis of the candidates application.

Renewal of the certification of competency

Renewal of the certification of competence must be applied for no less than two months prior to the certificate's expiry date. Should the application not be left then the certificant shall be removed from the sample taker registry upon expiry of the valid certification of competency. Application at a later date means that the application will be viewed as a new application.

The certification body reserves the right to cancel any certification of competency before the valid expiry date if the certificants actions in environmental sample taking or environmental measuring or in observation deserves cause for written complaint and if no corrective measures have been taken.

Certificant responsibility and obligations

Certificants in their environmental sample taking or environmental measuring or in observation must strictly adhere to the required methods of working and recognised practices that, for their part, ensure that such produced information is wholly reliable. Certificants have the responsibility of notifying their employer of deficiencies and faults in environmental sample taking or in environmental measuring or in observation, and which he or she is unable to resolve by his or herself.

Throughout the entire valid duration of the certification of competency certificants are obliged to provide, upon request, from the board of certification preconditions and explanations. Such explanations cover tasks carried out under the requirements of the certification of competency and attendance in education in his or her relative field. Responding to requests for explanation is one prerequisite for the valid duration of the certificate of competence to continue.

The certification body will maintain a register of sample takers which includes relative information on each certificant sample taker. The certification body will remain in constant contact with certified sample takers and furnish them with relative information on sample taking including development in the relative area, as well as relative literature and educational possibilities.

Approval of courses relevant to certification

The board of certification approves proposals made by certificant bodies relating to courses concerning knowledge requirements. Trainers of such courses are approved of when they apply for approval of such courses and the duration of the approval lasts for three years. Such courses are approved only when the relevant level of expertise and the level of independence in the educational basic course and special courses conforms to the requirements covering such and that the trainer conforms to the approved level of competency in the delivery of such training.

In applying for approval of courses the following must be included:

- A description of the course trainer's experience in professional education,
- the course program,
- a description of the lecturer's education and experience in his or her relative field as well as
- a description of how the written examination and its evaluation will be organised.

The following companies or organisation have been approved by the board of certification to organise courses relating to knowledge requirements:

- AEL, Kaarnatie 4, 00410 Helsinki
- Oulu University, Education and research services, PL 7910, 90401 Oulu
- Finnish Association of Water, Länsi-Uudenmaa water and environment/Västra-Nylands vatten och miljö, PL/PB 51, 08101 Lohja/Lojo

The content of courses relating to knowledge requirements

Basic courses covering knowledge requirements are to teach and stress the real need for correct sample taking, measuring and observation and the significance of this in achieving reliable and competent results in environmental research and monitoring. The courses are to address the separate relevant activities and special features of environmental sample taking as well as environmental measuring and in observing. In particular, educa-

tion is to cover operational quality and quality assurance requirements as well as activities relating to documentation. In addition, the courses are to include starting points of knowledge on operational quality legislature and occupational health and safety requirements.

The content of special courses in knowledge requirements is to teach and stress with the aid of practical examples correct sample taking, measuring and observation. In addition, the requirements concerning correct equipment and tools and their significance in achieving reliable and competent results in each special field's research and monitoring, as well as legislature and other special features.

Written performance examinations are organised after the course under the supervision of the course trainer. The certification body may approve the interview separately, for example at the environmental management's premises and supervised by the environmental management officials. In such circumstances, the questions are drawn up by the certification body that also organises the supervision. Answers to questions relating to trainer education in such examinations are checked by the course trainer. Other question answers not relating to trainer education are to be checked by the certification body.

The certification body determines the general points of the examinations. Values of conformity confirmed by the certification body may also be checked against the course trainer's question answers.

Awarded certificates of competency before 1.6.2001

Based on the decision made by the board of certification on 20.11.1998, all certificates are valid for the duration specified on the certificate. In renewing such certificates it is a prerequisite, apart from the date of validity, that no less than one special course and the relevant education has been successfully completed. The total duration of this course and education to upgrade knowledge in the relative field must be no less than 30 hours.

Should a certificant wish during the period of validity of his or her certificate of competency that it includes, in accordance with the latest agreed system, certification of competence in a special field, then he or she is to make an application to the certification body concerning this issue. The application must include details and certification of the special competence in question in conformity with the decision covering such situations. Receipt of the new certificate of competency is reliant upon conformity to the requirements covering knowledge. This refers to sufficient knowledge in the relevant special field, on a course approved by the certification body with no less than 10 hours of education, as well as the successful completion of education to upgrade relevant knowledge.

The collective duration of both special course and education to upgrade knowledge must be no less than (6) hours per valid certificate of competency. Both special course and education to upgrade knowledge may be super-

seded by a course to upgrade knowledge approved by board of certification, which combines both special fields of competency and where the total number of hours of education is equal to the earlier mentioned sum. Certificates of competence awarded under these terms are valid for a period of five years from the date of award.

The present situation of certification developments

The first environmental sample taker certificates were awarded at the meeting of the certification body on 29.4.1999. In 1999 the certification body approved a total of 52 applications. In 2000 116 certificates of competence were awarded to the relevant recipients. By June of 2001 environmental sample taker certificates of competence have been awarded to 258 people.

Preparations for the accrediting of the environmental certificate of competence system has commenced, and an application to the Finnish Accreditation Service (FINAS) of the centre for Metrology and Accreditation manages will be left during 2001.

Environmental sample taker certification can achieve relatively reliable quality assurance in sample taking and the successful monitoring of accredited laboratory level operations. Remaining is the planning of environmental research and its monitoring and in particular, the establishing of a supervisory system to cover reporting quality. It is desired that this will be established in accordance with the law governing environmental protection 108 § in the near future.