

# EAP Task Force

## CASE STUDY ON THE REFORM OF ENVIRONMENTAL SELF-MONITORING IN ESTONIA

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*This document was produced as part of the EAP Task Force demonstration project on environmental self-monitoring by industrial operators in Kazakhstan. The case study describes the reformed system of self-monitoring that Estonia adopted in late 1990es based on models used in the European Union. Please address questions on this case study to Angela Bularga at [angela.bularga@oecd.org](mailto:angela.bularga@oecd.org)*

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## 1. INTRODUCTION

### 1.1 Purpose of this Case Study

1. This case study addresses the reform and current organization of self-monitoring system in Estonia. It was developed within the context of the EAP Task Force demonstration project in Kazakhstan and presented to main stakeholders during the national seminar in Astana, Kazakhstan on 18 November 2003. The case study was prepared by Mr. Aare Sirendi, formerly from the State Environmental Inspectorate of Estonia.

### 1.2 What is self-monitoring?

2. The monitoring of industrial processes, their releases and their impact on the environment are key elements of regulatory control. Such monitoring may be undertaken by the competent authorities responsible for inspection duties. Industrial process operators may also be required to carry out monitoring themselves and report their results to the competent authorities. This is known as operator self-monitoring.

3. Self-monitoring does not constitute self-regulation; it is a part of the compliance control and compliance promotion which are the elements of the regulatory cycle. Self-monitoring provides additional information on which the competent authorities can judge whether an operator is complying with relevant legislation and conditions of permits. It does not change the duty of the competent authorities to assess compliance by means of inspection, and by using its own monitoring data, or by reliance on operator self-monitoring.

4. The weakest point in allowing the self-monitoring to be carried out by operators is that there is a possibility of producing false data. At the same time it enables to produce a bigger amount of data and makes the inspections faster.

### 1.3 Major elements of self-monitoring

5. The self-monitoring consists of three major elements:

#### *Operation monitoring*

6. Operation monitoring is needed in order to make sure that processes are run properly and efficiently, also that pollution abatement facilities are functioning properly. Another purpose is to guarantee that optimization of the use of raw materials, chemicals, water and energy takes place. It is important also to guarantee that process malfunctions, losses and the pollution load is minimized in every situation. Operation monitoring is an essential part of the emission control. Normally the whole operation monitoring is carried out by operators themselves.

#### *Emission monitoring*

7. Emission monitoring is carried out in order to know continuously what are the production losses and what is the quantity and quality of emissions and their variations. Wastewater discharges, emissions into the air, hazardous and non-hazardous wastes, noise are monitored. This information helps authorities to check whether operators will comply with laws, permits and standards.

8. Operators can carry out emission monitoring only if certain requirements are fulfilled. Appropriate quality requirements can be defined by law or the competent authority may establish them. Best practice is to use third party certification and accreditation schemes. These can certify or accredit equipment, personnel and laboratories as conforming to relevant standards specified by the competent authority. If operators are not capable of carrying out emission monitoring themselves, it has to be undertaken by independent consulting companies who have to prove their competence.

### *Impact monitoring*

9. The impact monitoring is the monitoring of the environment influenced and polluted by operators. It is carried out in order to make sure that the state of the environment as well as harmful impacts caused by the emission will stay on acceptable level. The statutory impact monitoring must be implemented by independent companies, research institutes which have to prove their competence. Operators are usually not allowed to carry out impact monitoring but they must pay the costs of the impact monitoring together with the costs of operation and emission monitoring.

10. In general, the impact monitoring programs include effects of waste water on water quality and biota and on fish stocks and fishing. The second field is monitoring of impacts of gaseous emissions to air quality and deposit. In certain, cases the monitoring of the quality of soil and ground water in vicinity of industries and dumping sites and monitoring of the effects of the air emissions and deposit on terrestrial flora and fauna is performed.

## 2. LEGAL REQUIREMENTS FOR SELF-MONITORING

11. A hierarchy of legal vehicles governs self-monitoring. Laws usually stipulate general obligations for self-monitoring. Further development of requirements for self-monitoring can be provided for in regulations, permits, or other legally-binding documents.

### 2.1 The IPPC Directive of the European Union: The Driving Force for Reform in Estonia

12. In late 1990s Estonia went through a very complex process of accession to the European Union. To acquire the EU membership, the country was required to comply with the community law, of which environmental legislation is an important and extensive part. The transposition of the EU environmental legislation was the main driving force for the reform of environmental policy instruments. Accession also implied a change in the philosophy of regulation: In order to become more effective and efficient, environmental authorities had to renounce the exclusive use of command-and-control levers, build less confrontational relations with the regulated community and, at the same time, transfer much of the responsibility for the protection of the environment on the regulates.

13. Besides modernizing its environmental policy and improving the design of regulation, Estonia's environmental authorities had to improve the regulatory monitoring too, since the supervision of polluters in the EU is based mainly on environmental self-monitoring, *i.e.* on monitoring carried out by operators of the industrial site themselves. In practice, this means that measurements and other necessary measures are undertaken either by operators (polluters) or by consulting companies (independent laboratories) whose work is paid by operators of the industrial site. Monitoring requirements are written down either in law, in environmental permits or in separate monitoring programs.

14. The Integrated Pollution Prevention and Control (IPPC) Directive is the main act that regulates the most polluting industry sectors. The Directive set of common rules on permitting for industrial installations. All installations covered by Annex I of the Directive are required to obtain an authorisation (permit) from the authorities in the EU countries. Unless they have a permit, they are not allowed to operate. The permits must be based on the concept of Best Available Techniques (BAT), which is defined in Article 2 of the Directive. In many cases BAT means quite radical environmental improvements and sometimes it will be very costly for companies to adapt their installations to BAT.

15. Article 9 of the IPPC Directive explicitly requires that self-monitoring is conducted: "The permit shall contain suitable release monitoring requirements, specifying measurement methodology and frequency, evaluation procedure and an obligation to supply the competent authority with data required for checking compliance with the permit". At the same time, for installations under subheading 6.6 in Annex I to the Directive<sup>1</sup>, the measures referred to in this paragraph may take account of costs and benefits. Article 14 requires the operator to regularly inform the competent authority of the results of the monitoring of releases and – without delay – of any incident or accident significantly affecting the environment.

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<sup>1</sup> These are installations for the intensive rearing of poultry or pigs with more than: (a) 40 000 places for poultry; (b) 2 000 places for production pigs (over 30 kg), or (c) 750 places for sows

16. The six categories of sectors<sup>2</sup> covered by the IPPC Directive are:

- Energy industry;
- Production and processing of metals;
- Mineral industry;
- Chemical industry;
- Waste management;
- Other activities (pulp & paper, textile, tanneries, slaughter houses, food production, intensive rearing of poultry or pigs, surface treatment using organic solvents, production of hard burnt coal or electrographite).

17. Some other Directives also contain self-monitoring requirements. For instance, a sectoral piece of EU legislation that has such requirements is the directive on Large Combustion Plants<sup>3</sup> (LCP). The LCP directive defines the frame for emission reporting for plants with over 50 MW of thermal capacity. The main principle is that continuous measurements of concentrations of SO<sub>2</sub>, NO<sub>x</sub>, and dust will be required for each combustion plant with a rated thermal input of 100 MW or more by the 27 November 2004. In more details the LCP requirements are described in Appendix 1. Further information can be found on the Internet, *e.g.* at [www.europa.eu.int/comm/environment/pollutants/combustion\\_report.pdf](http://www.europa.eu.int/comm/environment/pollutants/combustion_report.pdf)

18. In the EU, self-monitoring programmes are established by the integrated permits. In Appendix 2, one example of self-monitoring requirements is given on the basis of Finnish pulp industry. Similar requirements exist for any kind of large industrial activities.

## 2.2 Transposition of IPPC in Estonia

19. In Estonia, the IPPC was transposed through the following legal acts:

- **Integrated Pollution Prevention and Control Act** (RT I 2001, 85, 512, 2002, 61, 375) that entered into force 1 May 2002;
- **Governmental Regulation RT I 2002, 41, 258** that specifies sub-activities and threshold capacities subject to Integrated Permits and deadlines for the Operator of the existing installation submitting an Permit Application for an Integrated Permit;
- **Regulation of the Minister of the Environment RTL 2002, 65, 989** that provides a template for a note on submitting an Permit Application for an Integrated Permit and issuing an Integrated Permit;
- **Regulation of the Minister of the Environment RTL 2002, 140, 2035** that gives the annex forms for Integrated Permit Application and guidelines to fill them;
- **Regulation of the Minister of the Environment RTL 2003, 5, 47** that specified requirements for the contents of an Integrated Permit and the template for an Integrated Permit;

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<sup>2</sup> Some sectors are only covered if exceeding certain capacities.

<sup>3</sup> Council Directive 88/609/EEC on the limitation of emissions of certain pollutants into the air from large combustion plants.

- **Regulation of the Minister of the Environment RTL 2004, 49, 846** about submitting on the Internet a note about an Integrated Permit Application and note about issued Integrated Permit.

20. About 35 industrial enterprises, 20 combustion plants, 30 landfills and more than 50 pig and poultry farms are IPPC enterprises in Estonia. The § 7 (3) of the Estonian IPPC Act enacts the activities where an integrated is required. Government of the Republic Regulation “Sub-activities and threshold capacities subject to Integrated Permits and deadlines for the Operator of the existing installation submitting an Permit Application for an Integrated Permit” (RT I 2002, 41, 258) enacts sub-activities, threshold capacities and deadlines submitting an Permit Application in the frames of these activities.

21. To be mentioned, that the Estonian approach has so far been to issue single media permits: (i) Air permit; (ii) Water permit; (iii) Waste permit; and (iv) Permits for the use of natural resources. The Integrated Permit will replace the three first bullets for those installations, which according to the Estonian legislation, will need an Integrated Permit. An installation will have to apply separately for the permit to use natural resources. In certain cases, the licence for handling hazardous waste is required before operation could start.

### **2.3 Environmental Monitoring Act**

22. The general requirements on self-monitoring in Estonian legislation are also set in the Environmental Monitoring Act which states that:

“An operator shall carry out environmental monitoring at the expense of the operator in the area affected by its activities or by pollutants discharged into the environment as a result of its activities: (i) for the operator’s own purposes, if so desired; (ii) to the extent and pursuant to the procedure determined in the natural resources exploitation permit or the pollution permit issued to the operator pursuant to law;

The area affected by the activities of an operator or by pollutants discharged into the environment as a result of such activities shall be determined in the natural resources exploitation permit or the pollution permit.

The procedure for environmental monitoring carried out by an operator for its own purpose shall be established by the operator, and the environmental monitoring data obtained there from shall not be used against the operator if damage to the state of the environment is established.

Data from environmental monitoring carried out pursuant to a natural resources exploitation permit or a pollution permit shall be submitted by the operator to the issuer of the permit on the date specified in the permit.”

### **2.4 Medium-specific laws**

23. Furthermore, a number of sector specific laws (Ambient Air Protection Act, Waste Act, Water Act) establish how the self-monitoring requirements can be set by the permitting authority. For example, the Ambient Air Pollution Act states the following as regards the content of permits:

“The following shall be determined by a pollution permit:

- [...] monitoring of the quality of the ambient air in the area affected by the source of pollution;

- requirements for the monitoring of the volume of pollutants emitted and for determination of the efficiency of purification equipment; [...]”.

24. The Water Act states:

“The following shall be entered on a permit for the special use of water:

- [...] the requirements for determination of the amount of water abstracted from a body of water, quality control of water and maintaining records of the abstracted water;
- the requirements for the quality control of groundwater and measurement of the level of groundwater;
- the requirements for the monitoring of recipients of pollutants;
- the requirements for the monitoring of pollutants;
- the requirements for the submission of information to the issuer of permits for the special use of water [...]”.

25. The Waste Act gives the requirements on keeping of records, reporting and databases:

“Every waste holder shall have adequate information concerning the types, quantities and origin of the waste in their possession, about the properties of the waste significant from the standpoint of waste handling and about the hazards they cause to health or the environment.

Any person, who holds a waste permit and the producers of hazardous waste, except households, are required to regularly keep records of the type, quantity, properties and generation of the waste produced, collected, stored or temporarily stored, transported, recovered or disposed of in their activities. If waste is transferred to other waste handlers, records shall also be kept on the destination, frequency of collection, means of transport and recovery and disposal procedures of the waste.

The basic documents and consolidated data of the records shall be stored for at least five years.”

## **2.5 Self-incrimination aspects**

26. In certain countries, self-monitoring data cannot be used for taking any enforcement actions against the operator of the installation. It can be considered as self-incrimination. In these countries the competent authorities must perform additional measurements to have a basis for using sanctions and for prosecution.

27. In Estonia, as in most of the countries, it is allowed to start an administrative or criminal case on the basis of data from self-monitoring if the requirements for self-monitoring were set by the legal act or permit. The infringement of self-monitoring conditions is also considered to be illegal and the sanctions can be used against the violators in these cases.

28. If the industry performs the measurements in addition to the self monitoring program and voluntarily it is not allowed to use this data against them. The last principle is also included in the Estonian Act on Environmental Monitoring. Estonian legislation includes quite hard sanctions in case of non-compliance with reporting and monitoring conditions.

### **3. RESPONSIBILITY FOR SELF-MONITORING**

29. Historically, the competent authorities were mainly responsible for carrying out monitoring programs to check on operators' compliance and performance. However, there is a trend now in the EU and other OECD countries for the competent authorities to rely more on self-monitoring by operators. The authorities then inspect the operators' arrangements and may carry out more limited monitoring programs themselves to provide independent checks.

#### **3.1 Responsibilities of the competent authority**

30. The role of the competent authorities is to:

- Specify the requirements standards against which self-monitoring should be carried out using internationally agreed standards where they exist;
- Ensure that operators monitor performance properly by checking results, auditing the process and carrying out check monitoring;
- Act upon the results in an equitable manner;
- Publish information so that the public can see how operators are performing.

31. Enforcement authorities have to make sure that self-monitoring is carried out duly and that its results are reliable. In order to achieve this, the competent authorities must determine or approve the self-monitoring programs and determine or approve the specified measurement standards and quality requirements.

32. The competent authorities should require self-monitoring reports periodically from the operator. These should provide summary information, following data reduction, in a format facilitating easy comparison with permit limits. The competent authorities should also arrange for independent monitoring to be undertaken to provide checks on the reliability of self-monitoring data. This independent monitoring may include the calibration of instruments, sampling and analysis, and analysis of split or replicate self-monitoring samples.

33. They also have to inspect operators' self-monitoring arrangements and to check the reliability of the operator (for example, by carrying out independent monitoring). The competent authorities must approve the monitoring program, which may become a publicly available document, specify the standards and quality requirements for self-monitoring that are to be achieved by the operator, and ensure that possibilities for cheating and fraud are minimized.

34. In Estonia the Environment Inspectorate is concerned with inspection and enforcement. It employs approximately 210 staff at national level and in seven regional units, who are involved in controlled installation work and in forest and nature protection. Laboratories are independent businesses. Permitting is the responsibility of the county (15) authorities. The inspectorates provide positions and opinions on permits, including self-monitoring requirements.

### **3.2 The role of the operator**

35. The role of the operator is to:

- Carry out monitoring and analysis on the basis of an appropriate, quality-assured standard;
- Assess and act upon the results of the self-monitoring as part of their own management system;
- Make monitoring data publicly available (online in real time where appropriate). Such openness and transparency help to increase trust.

36. Industries should take the responsibility for ensuring they are not having an adverse impact on the environment and people. This may include monitoring of the environment beyond a site boundary.

### **3.3 Use of external consultants**

37. Both the authorities and operators are also increasingly making use of external contractors to undertake monitoring work on their behalf. However, the responsibility for the monitoring and its quality remains with the relevant authority or operator and cannot be contracted out.

#### 4. SELF-MONITORING REQUIREMENTS AS PART OF PERMITTING

38. Monitoring requirements must be considered and specified alongside limits when they are set for process emissions or receiving environments so that the means of measuring compliance can be readily understood. This section summarizes those aspects that need consideration as part of permitting, while Appendices 3 and 4 exemplify this summary based on Estonian legislation.

##### 4.1 Permit requirements where monitoring aspects must be considered

39. In order to adequately assess compliance with limit values set in permits it is necessary to have the following information:

- **The limit value for the relevant operating condition.** This is typically a pollutant emission value (*e.g.* mass release rate or discharge concentration) or an ambient pollutant loading (*e.g.* concentration or deposition on an environmental receptor). However, it may be a surrogate parameter value (*e.g.* opacity in place of particulate concentration, temperature in combustion chamber in case of waste incineration), or an efficiency value (*e.g.* efficiency of effluent treatment).
- **The relevant measured pollutant or parameter value.** This must be based on the same operating situation and units as referred to in the limit value. It may be a single result, or based on several results (*e.g.* an average). The measured value is typically expressed as an absolute amount.
- **An estimate of the uncertainty in measurements.** This is the overall uncertainty in measurements when they are made in situations where an installation is operating at the emission value limit or ambient values are at the environmental quality standard.
- **A level of statistical probability or confidence** above which measurements are deemed to be non compliant. The probability level may typically be 1 in 20 which corresponds to a 95% level of confidence.
- **Adequate contextual information concerning the situation in which the measurements were made.** This information is needed to confirm that the measurements were made in a situation where the limit value applies (*e.g.* in normal operating conditions; start-up or shut-down conditions).

40. While setting permit requirements, the Estonian regulators address the following aspects that are relevant for self-monitoring (see also Appendices 3 and 4):

- Conditions within a process (*e.g.* temperature of combustion);
- Equipment within a process (*e.g.* efficiency of abatement equipment);
- Emissions from a process (*e.g.* pollutant release rates, fugitive releases);
- Efflux conditions at a process (*e.g.* exit temperature, exit velocity or flow);

- Impacts in receiving environments (*e.g.* ambient pollutant concentrations, noise, odour, light and vibration);
- Resource usage (*e.g.* energy used or pollution emitted/unit of production).

41. The compliance with limits is judged using appropriate measurement methods. The general approach is assessing position, timing, time-scale and feasibility of measurements then to decide on the (separate of combined) use of the following options:

- **Sampling and analysis.** This involves taking a physical sample from an emission or environmental receptor and then analyzing it in order to identify the species and amounts of pollutants present. Cumulative information can be obtained by taking time-averaged or flow-proportional samples using automatic sampling equipment.
- **Continuous measurement.** This involves making direct measurements of pollutant concentrations in-situ with instruments that give immediate and continuous results. The main advantages of this approach are that it gives information with a high time resolution and virtually no time delay. The disadvantages include the difficulty and cost of calibrating and maintaining instruments under possibly difficult field conditions.
- **Surrogates.** These are parameters which are closely related to direct pollutant values (*e.g.* concentrations) and may be measured as a convenient substitute for them.
- **Remote sensing.** This technique is usually used for measuring ambient pollutant concentrations from a distance. The main advantage is that pollutant loads can be mapped over a wide area and at high time resolution.

## 4.2 Self-monitoring programmes

42. The monitoring methods together with requirements with regard to sampling locations, timing, duration, quality and reporting requirements form a compliance monitoring programme. It is as necessary to comply with the monitoring obligation, as with the limit value. Best practice requires that the relationship between the limits and the monitoring programme are clear and unambiguous. It is important that the specified monitoring requirements cover all relevant aspects of the limit. Furthermore, it is useful to consider the following aspects:

- the formal (*e.g.* regulatory) context of the limit, and hence of the monitoring;
- the feasibility of limits with regard to available measurement methods;
- the general types of measurement methods available for relevant scales/needs;
- the compliance assessment procedures and reporting requirements;
- quality considerations.

43. The time at which samples and measurements are taken may be crucial to obtaining a result which is relevant to the limit. Any timing requirement of the limit and associated compliance monitoring must be defined so as to avoid ambiguity. The timing may depend on plant processing conditions when a process is operating in upset and abnormal conditions<sup>4</sup>, any required monitoring method may differ because the pollutant concentrations may then exceed the scale of the method used in more normal conditions.

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<sup>4</sup> Upset and abnormal operations may include start-up, leaks, malfunctions, momentary stoppages and definitive cessations.

## **5. SAFEGUARDING QUALITY AND ENSURING DATA RELIABILITY**

### **5.1 General measures to safeguard quality**

44. Safeguards apply to operators and authorities and to any contractors appointed to do monitoring work. Examples of safeguards which cover the main on-site and laboratory activities within compliance monitoring are given below:

- inspection of the overall plan and system of monitoring;
- inspection of the operator's management of the monitoring system;
- inspection of particular detailed monitoring activities;
- inspection of maintenance and calibration of monitoring instruments and equipment;
- inspection that the process operating conditions at times of monitoring are known/relevant;
- occasional independent check monitoring by authorities or external contractors acting on their behalf;
- use of standard methods for testing, sampling and analysis;
- use of certified instruments and personnel and accredited laboratories.

45. Also the safeguards must be applied to the processing, evaluation and assessment of monitoring data by checking that appropriate statistical methods have been selected and correctly applied. Uncertainties in sampling and analyses should be correctly assessed and included.

46. The requirements for the testing laboratories are established by the law in Estonia: Testing laboratories shall be accredited and shall perform comparative tests with other laboratories. A comparative test is the organisation, performance and evaluation of tests of samples or materials of the same kind with the participation of two or more laboratories.

47. Comparative tests shall be organised by reference laboratories which are selected from among the testing laboratories and authorised therefore by the Minister of the Environment and which are responsible for the accuracy of the analyses of samples taken from emissions and environment.

### **5.2 Regulatory sampling**

48. The inspecting authorities in Estonia are performing regulatory sampling to check the quality of self-monitoring. This right is established by the Act on Environmental Supervision which states the following on the procedure of taking control samples:

“Upon inspection of the adherence of legislation for environmental protection to the requirements, inspectors have the right to take control samples, conduct measurements and require presentation of documents related to environmental protection.

A control sample shall be packaged in a manner which precludes its exchange or alteration without damaging the package.

Upon the delivery of a control sample to another person or upon its return, an instrument of delivery and receipt shall be prepared which shall indicate the condition of the control sample and its package.

If an environmental protection inspector or persons accompanying the inspector are not granted access to the object for the performance of their functions, the inspector has the right to apply enforcement measures for entry, by use of physical force.”

### **5.3 Reference laboratory**

49. "Reference laboratory" means a laboratory, whose performance is unbiased as demonstrated in inter-laboratory performance studies or blind audits. In Estonia, the right to operate as a reference laboratory shall be granted on the basis of a written application from a testing laboratory and by a directive of the Minister of the Environment in which the extent of the authorisation is specified. The Minister of the Environment shall grant the right to operate as a reference laboratory to one testing laboratory from each of the fields of activities. A reference laboratory shall:

- Take part in international comparative tests in its field;
- Provide testing laboratories with methodological guidance;
- Evaluate the compliance of the analysis methods used by the testing laboratories with the analysis reference methods
- Perform comparative tests of testing laboratories and evaluate their results;
- Provide in-service training.

### **5.4 Attestation**

50. Attestation is necessary in order to guarantee that the laboratory personnel are knowledgeable of approved methodologies and quality control procedures, that the equipment necessary to perform these analyses are available in the laboratory, and that all analyses will be performed using approved methods. For example, the compulsory attestation of the persons responsible for taking water samples is established by the Estonian Water Act:

- A person responsible for taking a sample who is performing a water study shall use appropriate measuring and sampling equipment and shall be attested.
- The attestation of a person responsible for taking a sample who is performing a water study shall be organised by the Minister of the Environment and shall be carried out once every two years pursuant to the attestation procedure approved by the Minister of the Environment.

51. The environmental inspectors and the representatives of industry both are required to go through this attestation.

### **5.5 Transparency and public participation**

52. An important measure to preserve the integrity of the system is to ensure its transparency and to allow for public participation. In Estonia, a database of all environmental permits was established that is accessible to the general public via internet. Since 2003, water monitoring data

were added to the database besides permits themselves. All other self-monitoring data is accessible to the public only on request.

53. It is a general rule that data on environmental monitoring that is ordered and paid by state authorities should be available to the public via internet. For example, for the purposes of air quality management on the whole territory of Estonia the system of collection of monitoring (including self-monitoring) data, emission data, ambient quality data is elaborated in Estonia. In addition to the collection of data the system allows to process the data, to make dispersion calculations for the whole territory of the state and to produce reports to the public, press and international organizations (see attached scheme). The results of the monitoring are accessible to the public via internet and through info screens.

54. The requirement of making the monitoring data publicly available is set down in Estonian legislation. Thus, the Act on Integrated Pollution Prevention and Control states:

- Applications for permits, draft permits, permits, environmental monitoring results in the possession of competent authorities assigned by permits and inspection results concerning compliance with the requirements of permits are public.
- Information concerning the building design or activities of an installation, composition or use of certain raw materials, chemicals or other materials or products may be made confidential if such information is submitted as a separate part of the application and is clearly marked with the word “Business secret”. Information bearing such notice may be made public by the issuer of permits with the consent of the applicant unless otherwise provided by law.

## **5.6 Enforcement actions against data falsification and misreporting**

55. There have been cases in Estonia when the operator systematically showed self-monitoring results that were lower than those obtained from sampling done by the permitting authority or inspectors. Such cases took place during the first years of the self-monitoring reform. The sanctions available nowadays deter misreporting and data falsification.

56. The competent authorities may take a wide range of actions including formal enforcement actions in response to evidence of non-compliance, as revealed by monitoring. Examples of these actions are:

- Orders (prescriptions);
- Permit reviews and new permits;
- Fees, charges and administrative fines;
- Criminal prosecution.

57. The Penal Code of Estonia gives the sanctions used against the violators of the requirements on self monitoring and reporting:

- Violation of the requirement to record the use of natural resources or to record the amounts of pollution or the requirements for environmental monitoring is punishable by a fine of up to 100 fine units or by detention.
- The same act, if committed by a legal person, is punishable by a fine of up to 1900 EUR.



**APPENDIX 1:  
SELF-MONITORING REQUIREMENTS FOR LARGE COMBUSTION PLANTS  
IN THE EUROPEAN UNION (DIRECTIVE 2001/80/EC)**

The European Union's Directive 2001/80/EC established the emission limit values for emission into air from large combustion plants. Permitting authorities should take these values as a basis for setting permit conditions. In fact it means that, in the case of large combustion plants, the permit should not contain any different self-monitoring requirements than those that are set by the Directive.

Article 12 of the Directive states that member states shall take the necessary measures to ensure the monitoring of emissions from the combustion plants covered by the Directive and all other values required for the implementation of the Directive. Member states may require that such monitoring shall be carried out at the operator's expense.

Article 13 states that member states shall take appropriate measures to ensure that the operator informs the competent authorities within reasonable time limits about the results of the continuous measurements, the checking of the measuring equipment, the individual measurements and all other measurements carried out in order to assess compliance with the Directive.

Article 14 states that in the event of continuous measurements, the emission limit values shall be regarded as having been complied with if the evaluation of the results indicates, for operating hours within a calendar year, that none of the calendar monthly mean values exceeds the emission limit values. In the case of sulphur dioxide and dust: 97 % of all the 48 hourly mean values do not exceed 110 % of the emission limit values. In the case of nitrogen oxides: 95 % of all the 48 hourly mean values do not exceed 110 % of the emission limit values. The start-up and shut-down periods shall be disregarded. The rates of desulphurisation shall be regarded as having been complied with if the evaluation of measurements indicates that all of the calendar monthly mean values or all of the rolling monthly mean values achieve the required desulphurisation rates.

Competent authorities shall require continuous measurements of concentrations of SO<sub>2</sub>, NO<sub>x</sub>, and dust from waste gases from each combustion plant with a rated thermal input of 100 MW or more. By way of derogation continuous measurements may not be required in the following cases:

- For combustion plants with a life span of less than 10 000 operational hours;
- For SO<sub>2</sub> and dust from natural gas burning boilers or from gas turbines firing natural gas;
- For SO<sub>2</sub> from gas turbines or boilers firing oil with known sulphur content in cases where there is no desulphurisation equipment;
- For SO<sub>2</sub> from biomass installations if the operator can prove that the SO<sub>2</sub> emissions can under no circumstances be higher than the prescribed emission limit values.

Where continuous measurements are not required, discontinuous measurements shall be required at least every six months. As an alternative, appropriate determination procedures, which must be verified and approved by the competent authorities, may be used to evaluate the quantity of the above-mentioned pollutants present in the emissions. Such procedures shall use relevant CEN<sup>5</sup> standards as

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<sup>5</sup> CEN is the European Committee for Standardisation.

soon as they are available. If CEN standards are not available, ISO standards, national, or international standards which will ensure the provision of data of an equivalent scientific quality shall apply.

Moreover, the sulphur content of the fuel which is introduced into the combustion plant facilities must be regularly monitored. The continuous measurements should include the relevant process operation parameters of oxygen content, temperature, pressure, and water vapour content.

**APPENDIX 2:  
EXAMPLE OF ORGANIZATION OF SELF-MONITORING  
IN FINNISH PULP INDUSTRY**

The self monitoring programs for industries that fall under Directive on integrated pollution prevention and control are established by the permits. Below one example of this system is given on the basis of Finnish pulp industry but the similar requirements exist for any kind of large industrial activities.

The permit imposes the obligation to monitor the formation of waste water, the efficiency of the waste water treatment plant, the use of chemicals, the quantity and quality of wastewater discharged into sea and also the impact of that wastewater on the watercourse in accordance with the program of monitoring approved by the competent authority. The programme includes in addition the statement of principles governing monitoring of exceptional discharges.

The effects of waste water on fish stocks and fishing as well as the efficiency of fishery management measures should be monitored. In addition to waste water monitoring it is required that all air emissions from the different pollution sources (including the power plant) should be monitored continuously and the industry should participate in the ambient air monitoring program of the surrounding city. The costs of the ambient air monitoring are divided between industries that affect the air quality in the area.

Operation control and emission monitoring are employed to follow the operation of different processes, to trace the sources of any exceptional discharges and to determine the quality and quantity of the wastewater discharged into the watercourse. Operation control also serves to optimize the operation of purification plants in order to keep the level of effluent as low as possible. The purpose of emission monitoring is also to ensure and verify the compliance with permit conditions at the factory. It is a general rule that the installation is considered not to be in compliance if the limit value of even one sample is exceeded at least by two times. In case of taking 4-7 samples per year it is allowed that the limit value can be exceeded in one sample but not more than two times.

The pulp mill laboratory takes care of emission monitoring and most of the internal wastewater monitoring. The laboratory is part of the pulp mill's certified ISO 9002 quality system and the ISO 14001 environment system. The personnel taking the wastewater samples have been trained for that task. The laboratory uses standardized analytical procedures and the equipment is calibrated in accordance with the specifications of the quality system. The wastewater analysis procedures have been divided into units for those persons carrying out the analysis in the laboratory. After receiving a sample the laboratory worker preprocesses the sample in accordance with the directions, carries out the analysis properly and enters the results into the plant information system. The system calculates the final load taking into account data on water flow.

The final monthly load is obtained on the basis of the daily samples by multiplying the average content of the analyzed daily samples by the monthly average flow. The cooling waters of the power plant and the pulp mill are not taken into account in the wastewater quantities. These waters are led into the water course through a separate drainage system. The monthly wastewater report to the authorities includes production and total wastewater load as well as the results of the monitoring of landfill seepage and spillage water channeled to the activated sludge plant. The monthly report includes details of stoppages and significant disruptions in productions as well as malfunctions in purification equipment.

The reports are sent to the electronic database system. The system collects the data from all industries on water discharges, air emissions and waste data. The system also includes documents like permits and inspection reports, letters send to the operator. It includes the data on production and raw materials and fuels enables to get different reports for different users. The system is intended as a tool for inspectors. It supports them in their work by providing an integrated working environment that allows them to share data and information. Another function of the system is to collect raw data for statistical purposes.

**APPENDIX 3:**  
**SELECTED SECTIONS FROM THE REGULATION NO 68 OF THE MINISTER OF ENVIRONMENT (2002) ON STANDARD FORMATS OF ANNEXES TO A PERMIT APPLICATION AND THE PROCEDURE FOR COMPLETION<sup>6</sup>**

This regulation has been established pursuant to subsection 4 of section 9 (RT I 2001, 85, 512; 2002, 61, 375) of the Integrated Pollution Prevention and Control Act.

**§ 17. Emission and environmental state monitoring**

- (1) Data on ambient air quality monitoring shall be given pursuant to table 1 in annex 9.
- (2) Data on water pollution source outlet monitoring shall be given pursuant to table 2 in annex 9.
- (3) Data on water body monitoring in the zone of influence of the outlet shall be given pursuant to table 3 in annex 9.
- (4) The following shall be added to data:
  - 1) the list of sampling and measuring points, their locations on a map or plan or their grid reference and a scheme in case they are located outside the map or plan;
  - 2) measures planned to monitor waste and emission generation.

**§ 18. Zone of influence of installation's activity**

The following data shall be submitted concerning the zone of influence of installation's activity:

- 1) zone of influence of waste water, waste generation and management, noise and vibration transmitted in ambient air and pollutants released into ambient air;
- 2) zone of special use of water;
- 3) influence of the activity to the state of a water body and ground water.

**§ 19. Emission's environmental impact monitoring**

The following information shall be given in application materials concerning environmental impact monitoring of emissions from the installation:

- 1) measures applied to monitor ambient air quality and recipient area of discharged waste water, indicating sampling points or addresses of stationary measuring stations and their grid reference, also background data and evaluation of changes in the pollution level as a result of continuous monitoring or evaluation of total effect of similar sources of pollution;
- 2) measures applied to monitor waste treatment points and the description and location of sampling points;
- 3) measures applied to monitor ground and ground water past pollution;
- 4) measures applied to monitor noise and vibration transmitted in ambient air and the location of measuring points.

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<sup>6</sup> Source: <http://www.envir.ee/ippc/english/legislation.htm>



Regulation of the Minister of Environment  
 “Standard formats of annexes to a permit application and the procedure for completion”

**ANNEX 8: MAINTENANCE AND CONTROL OF TECHNOLOGICAL, CLEANING INSTALLATION OR TREATMENT FACILITY**

Equipment Name, type	Maintenance		Control				
	Name of activity	Frequency	Measured index	Measuring frequency	Measuring equipment		
					Name, type	Work regime (duration)	Calibration frequency
1	2	3	4	5	6	7	8
Technological installation							
Cleaning installation for pollutants emitted into ambient air							
Water treatment facilities							
Waste handling facilities							

**APPENDIX 4:**  
**SELECTED SECTION FROM THE REGULATION NO 77 OF THE MINISTER OF ENVIRONMENT “REQUIREMENTS WHICH SPECIFY THE CONTENTS OF A PERMIT AND STANDARD FORMATS FOR PERMITS”<sup>7</sup>**

This regulation has been established pursuant to subsection 7 of section 17 (RT I 2001, 85, 512; 2002, 61, 375) of the Integrated Pollution Prevention and Control Act.

**§ 12. Emission and environmental state monitoring**

- (1) Requirements for ambient air quality monitoring shall be determined pursuant to table 1 in annex 10.
- (2) Requirements for pollution source outlet monitoring shall be determined pursuant to table 2 in annex 10.
- (3) Requirements for water body monitoring in the zone of influence of the outlet shall be determined pursuant to table 3 in annex 10.
- (4) Requirements for waste generation monitoring shall be determined pursuant to table 4 in annex 10.
- (5) Requirements for emission’s environmental impact monitoring shall be determined pursuant to table 5 in annex 10.
- (6) Measures for more efficient emission monitoring shall be determined pursuant to table 6 in annex 10. If necessary, the scope of a control by an accredited or certified laboratory shall be determined, including frequency of control, controlled substances and measuring points.

**§ 13. Zone of influence of installation’s activity**

- (1) The following data shall be submitted concerning the zone of influence of installation’s activity:
  - 1) zone of influence of waste water, waste generation and management, noise and vibration transmitted in ambient air and pollutants released into ambient air;
  - 2) name of a person who carried out environmental impact assessment, time of environmental impact assessment and summary of results;
  - 3) zone of special use of water;
  - 4) influence of the activity to the state of a water body and ground water.
- (2) Data mentioned in subparagraph 1 shall be recorded, if possible, on a map or plan, or, if this is not possible, shall be added to the map or plan as an explanatory text.

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<sup>7</sup> Source: <http://www.envir.ee/ippc/english/legislation.htm>



**Table 3. Monitoring of a water body in a zone of influence of an outlet**

Source of pollution		Outlet code	Water body		Measuring point location			Pollutant		Monitoring frequency	Permitted method (measuring or calculation method)	Used measuring instruments and equipment		Laboratory making analysis
name	No on a plan or map		name	Water cadastral code	No on a plan or map	Grid reference		CAS / EINECS/ ELINCS No	Name					
						X	Y					Name, type	Calibration frequency	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

**Table 4. Waste generation monitoring**

Waste			Measures to organise waste generation monitoring
Code	name	Danger class	
1	2	3	4

**Table 5. Emission's environmental impact monitoring**

Factor causing environmental impact	Measures to organise environmental impact monitoring
1	2

**Table 6. Measures for more efficient emission monitoring**

Activities	Description of a measure	Date of application of the measure
1	2	3

Regulation of the Minister of Environment

“Requirements which specify the contents of a permit and standard formats for permits”

**ANNEX 14: FORMAT, FREQUENCY AND SCOPE OF DATA SUBMITTED TO THE ISSUER OF PERMIT BY AN OPERATOR**

Type of data	Format of submitting data	Frequency of submitting data	Scope of data
1	2	3	4

Regulation of the Minister of Environment

“Requirements which specify the contents of a permit and standard formats for permits”

**ANNEX 15: INTEGRATED PERMIT CONDITIONS ANNUAL INSPECTION RESULTS**

Year	Result
1	2

