

Environmental Auditing-Analysis of Enterprises

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Abstract

In July 1993 a new prescription of the EC was finished, concerning the voluntary participation of enterprises in a common auditing system. By this in the EC-member countries there must be founded centers of environmental auditing where experienced experts of environmental auditing should be accredited. These accredited experts are controllers for evaluating and certification of carried out environmental-audittings.

An environmental-auditing practically represents an environmental assessment for an already existing enterprise with establishing corresponding programmes and strategies for the internal management to improve the environmental relations. Much experiences, which could be collected in the field of EIA during the last years may be transferred to this new task immediately. Only an essential difference there should not be overseen because of national legislation EIA in the defined cases must be carried out. By the EC-prescription carrying out an environmental-auditing for an enterprise is optional, it is recommended only. It was not introduced as a must. In spite of this fact because of the hard competition on the market there will be developed a pressure for the enterprises, to carry out such environmental-audittings. At present already a number of first projects in this direction can be seen, in the first line above all enterprises with the necessary economic power want to use this possibility, to gain better positions on the market.

We have already gathered the first experiences in this field. We arranged corresponding contacts to several enterprises within the surroundings of Dresden.

Within an opening discussion, where the project is explained and discussed with the management of the enterprise very detailed, the understanding, the readiness and the cooperation for the project are generated necessary prerequisites for the success of the whole work. By means of careful detail-work in collaboration with all departments and on all levels of the enterprise the total mass and energy-balances of the factory established and analysed.

There are included also such ranges like material delivery, personal policy, public relations and sale as well as waste management. It is important that all people working in the factory have the feeling to be our partners, and not to have the impression to be checked or controlled by an outside organization. This one of the most important factors of environmental auditing, in order to wake up and to develop a common interest on all sides.

At the end of the environmental auditing there will be according to the prescription of the EC a catalogue of measures to do immediately, short time, mean time and long time for improvement of the environmental situation of the

enterprise. All proposals are made in connection with a corresponding economic evaluation. These measures and programmes are declared as the environmental manual and are the basis for the work of the environmental management of the enterprise for the next three years.

According to the EC-prescription, the enterprise with this environmental manual can get a corresponding certificate, which may be used for public relation purposes.

keywords : eco audit, environmental auditing

In June 1993 the EC-regulation for "optional participation of enterprises in a common system of environmental management and environmental auditing" was approved./1/It became valid 21 months later. Already 12 months after approval the EC member countries should have built up their competent bodies for registration and publication of the audited objects. In Germany the necessary national legislation for accreditation and supervision of environmental audit experts at present is under work yet.

By this regulation the enterprises shall get motivation to an offensive environmental policy and its practical realization by a production-integrated environmental concept. It represents the attempt, a progressive environmental management for an enterprise to become a must by self-controlling forces of the market, if it wants to survive on the market.

Besides meeting all necessary environmental regulations and legislation the enterprise is asked for a corresponding continual improvement of its ecological level by introduction of economically acceptable application of available best technology. It is not very clear what for a small or mean size enterprise really is "economically acceptable", as well as what is the "available best technology".

There was a lot of criticism because the participation is optional and because there is no unique standard of evaluation. Differences between the several countries of the EU are not

impossible.

Figure 1 shows the mechanism of the environmental audit system. There are environmental experts external or internal, which are able to carry out the necessary investigations and to develop the corresponding measures like changes of technology, organization, product concept, staff development, public relations etc. for the enterprise. These conclusions are combined to the environmental manual of the enterprise. This environmental statement must be verified by an accredited environmental expert. The verified statement then is sent to the competent body for registration. About this registration the competent body informs the EU-commission. The enterprise gives an information to the public about the auditing carried out. In its logo the enterprise then is allowed to use the EU-sign of environmental auditing. So in each EU-country an accreditation system must be built up for environmental experts. Because of the rules of common market within the EU an expert, who is accredited in one EU-country is allowed to verify in all EU member countries.

Figure 2 demonstrates the sequence of steps and the relations between them within the environmental auditing system. According to the EC-regulation the environmental auditing (also "ecoauditing" or "eco audit") represents a tool of management containing a systematic, documented, periodic and objective evaluation of the effectivity of organization, manage-

ment and procedures for environmental protection with the aim of easier management control of all measures, which could have any environmental impact and to evaluate how far all the activities within the enterprise correspond with the environmental policy of the enterprise.

So at first the enterprise has to elaborate its environmental policy. The existence of a defined environmental policy is a basic prerequisite for the enterprise to take part in the auditing system. The environmental policy contains all aims within the development and handling strategy of the enterprise. To maintain all environmental laws and prescriptions there is a precondition, of course.

The initial environmental review represents an introductory investigation of all relations and activities of the enterprise on the site under consideration which could be of any environmental relevancy. It delivers the frame for all further researches within the environmental auditing.

The environmental programme delivers all particular aims and activities of the enterprise within an environmental handbook, including all necessary measures and the periods of time for their realization as well as the corresponding cost benefit considerations.

The environmental management system represents that part of the whole management system of the enterprise which is of environmental relevancy: structure of organization, responsibilities, behaviour and prescriptions, procedures and means for realization of the environmental policy.

If all these preconditions are realized the environmental audit of all internal structures of the enterprise is started. This may be

- delivery of raw and auxiliary materials as well as energy,

- storage of raw and auxiliary materials,
- production processes,
- product concepts,
- product management,
- waste water,
- emissions and flue gas problems,
- waste management,
- contracts with deliverers and costumers,
- self-supervision and self-control,
- safety and security,
- staff management,
- contacts to regional authorities(not only environmental),
- public relations etc.

A lot of material and energy balances must be made for the whole enterprise as well for all defined subsystems, the technological processes must be analyzed to look for technological weaknesses. Necessary measures are derived, costs and benefits are calculated and a programme of activities is formulated usually for the next three years, normally the period up to the next environmental audit. As already mentioned above, the results found by this investigation are laid down in the environmental manual of the enterprise.

An independant accredited environmental expert verifies the environmental policy, the environmental management system, the environmental programme and the environmental manual and-if all demands are fulfilled-gives his certificate. Thus the accredited expert should have a very high competency on that field of technology and economy where he is accredited to give certification, but also the expert or the team of experts carrying out the environmental audit should develop a high level of creativity and activity to guide the enterprise to a progressive environmental development on all fields of activity.

At present we are in the start period, a lot of pilot auditings are carried out in nearly all industrial branches in the EU-countries. A large number of deficits is found in connection with these first auditings : Sometimes there does not exist an environmental management system, often there is no defined environmental policy for the enterprise, the environmental relations on the site under consideration are not clearly known, a lot of unused economic reserves is found in the waste management systems, errors exist in the field of flue gas and waste water treatment, contracts could be rearranged with advantageous environmental effects, staff development should be improved etc.

Some of our experiences gathered in a number of test audits during the last two years I would like to present you in a concentrated form as far as it may be generalized. Further should be noted that at present practically all consulting firms in Europe offer to carry out environmental auditings. It is an extremely hot market today.

To carry out environmental audits a number of firms offer programmes and concepts. The International Chamber of Commerce started the development of an audit procedure on the basis of checklists. All necessary steps of investigation are formulated as checklists within questionnaires. Until now there are some hundred questions. The strategy, however, to carry out an environmental audit only on the basis of checklists cannot be accepted. It seems to be dangerous, because there exists the possibility of misuse by incompetent or low qualified experts : The audit practice only by means of comfortable checklists delivers the wrong feeling of competency, to be sure to forget nothing. But there is no really understanding of the technological processes going on and the selected process parameters. The use of checklists as a help for memory might be a support for the environmental expert, of course, if they contain the top-

ics of the investigation, remarks for possible conclusions or for some further problems not to forget to analyze within the job of auditing the enterprise and its several departments.

In connection with the first auditing in an enterprise there must be a presentation of the EC-regulation. Also if the top management would have read the material a lot of questions will have to be answered. Especially there must be clear, what is the specific aim of the regulation and which ways to reach it exist in the considered enterprise. The understanding of terms like environmental policy, environmental management, environmental programme of environmental audit should be totally clear. It must be understood by all staff members in the enterprise that the auditing expert needs full cooperation, that he is not a controller against whom the internals of the enterprise all should be secret. This readiness must be developed by corresponding motivation of all staff members. The experience was that to reach this an opening and beginning with an introductory meeting of all staff members together with the management of the enterprise and the expert or the team of experts who do the auditing is useful. Further on the staff members should get the opportunity of free contacts with the auditing expert who also should have free access to all departments of the enterprise. The expert never will publish any data of the enterprise without agreement of course.

Also at the beginning should already be stated how the necessary data are delivered by the enterprise's staff itself. Otherwise a lot of data must be found out are estimated by measurements and time consuming balance calculations by the environmental expert himself, balancing the whole enterprise or factory as well as the several systems (production processes of production steps).

The expert or the team of experts should find a good and realistic understanding of all technical/technological procedures

by means of flow charts and other graphics and schemes. This is the basis for the following balances of raw materials, auxiliary materials (cleaning agents, packaging materials etc.) in the total as well in the several subsystems. Very important is also the selection of the correct balance period—the best is a balance over one year, if all necessary data can be delivered or estimated for the enterprise's material and energy household.

The new environmental programme for the next three years period directly will be established on the basis of the defined environmental policy of the enterprise considering the results of the environmental audit, in narrow collaboration with the managers and all other responsible in the factory. The results of technology weak point analysis are used for elaboration of necessary measures for the improvement of the environmental situation, weighted by means of a cost benefit analysis calculating the financial frame to estimate a realistic perspective of the time horizon for realization. This new environmental programme is laid down as the environmental handbook of the enterprise, which could be checked at every moment or every day—how far the enterprise with its environmental management this programme has set into life. Finally to inform the public the environmental statement is formulated according to the rules given within the EC-regulation (article 5).

After the certification by an accredited environmental ex-

pert this all is sent to the competent body (of the country) for registration.

At the end there are two main questions : For what reason an enterprise could be interested in taking part within such an auditing system—and what would be the best qualification for doing the job of environmental audit?

Figure 3 shows the several fields of interest for an enterprise to take part in the audit system. It seems to be a wide field of different advantages to wake up the commercial interest of an enterprise in ordering an environmental audit. Especially this important considering the fact that the consulting costs are rather high : Of course, the prices may vary between the several branches and enterprise, but for orientation—a price of 150,000 DM might be possible for an enterprise with about 150 employees.

What concerns the scientific profile of the audit experts the collected experiences have shown, that a training in engineering sciences—e. g. as a process engineer—delivers a solid basis for doing this job as a skilled and competent environmental expert. Especially the ability to understand and to analyze technological processes, to think within balances, to see or to detect relationships is sufficiently developed in this specialization. Additional knowledge in the field of law, economy, ecology, and management easily can be acquired.