

4.5.1 MONITORING AND MEASUREMENT

THE PURPOSE OF MONITORING AND MEASUREMENT

Monitoring involves routine surveillance or observation of operations to ensure their satisfactory performance, to check on required progress and improvements, and to detect problems. Measurement occurs when quantitative readings are made of, for example, operating variables, emissions, or environmental impacts. Monitoring and measurement are used to:

- Track progress in the EMS, e.g., towards objectives and targets, in reducing the number of non-conformances, in training of personnel
- Identify sources of problems and their environmental impacts promptly and accurately
- Catalyse rapid and appropriate corrective and preventive action when something is wrong
- Assess environmental performance compared with regulatory requirements
- Demonstrate due diligence and for self-assessment
- Meet commitments in the environmental policy.

WHAT SHOULD BE MONITORED AND/OR MEASURED

There is an almost endless list of variables that could be monitored to provide information on an EMS. Most organizations probably monitor too few items and do it too infrequently. A key

in designing monitoring programs is to identify the critical variables that will provide a 'pulse check' on the EMS, and to assess how often and to what level of accuracy and precision monitoring and measurement is needed to ensure continuing good health of the system.

ISO 14001 4.5.1 MONITORING AND MEASUREMENT says:

The organization shall establish and maintain documented procedures to monitor and measure on a regular basis the key characteristics of its operations and activities that can have a significant impact on the environment. This shall include the recording of information to track performance, relevant operational controls, and conformance with the organization's environmental objectives and targets.

Monitoring equipment shall be calibrated and maintained, and records of this process shall be retained according to the organization's procedures. The organization shall establish and maintain a documented procedure for periodically evaluating compliance with relevant environmental legislation and regulations.

Following are some general subjects that must be routinely monitored:

- Overall conformance of operations with requirements of the EMS
- Tracking progress towards achieving objectives and targets
- Environmental performance indicators associated with environmental management

programs, and legal compliance requirements

- Operation of production and manufacturing equipment and processes associated with significant environmental aspects, and pollution control equipment.

Some specific routine monitoring that should be done, and measurements that should be made include:

- Emissions to air, discharges to water, and solid waste disposal
- Environmental impacts on air, water, land, biota, ecology, humans
- Energy use
- Handling, storage, and disposal of chemicals, fuels, hazardous materials and wastes
- Training needs, training conducted, employee environmental awareness and competence
- Communications from interested parties, and the organization's responses
- Emergency response incidents
- Quality assurance and quality control (QA/QC) for environmental sampling and laboratory analysis
- Effectiveness and timeliness of corrective and preventive actions
- Environmental performance of contractors
- Whether documentation is up to date, and adequately controlled.
- Anything ISO 14001 says "shall be maintained".

Instruments that are used to take measurements for the EMS must be regularly calibrated to assure the accuracy of all readings. And the

organization's compliance with environmental legislation and regulations must be routinely monitored, to fulfill the commitment in the environmental policy.

Note that two of the ten places where ISO 14001 specifies a documented procedure are in this element of the Standard. Clearly, there is an emphasis on reliability, reproducibility, and a consistently high standard of performance in monitoring and measurement.

SUMMARY OF KEY POINTS

- Thorough monitoring and measurement are keys to consistent environmental performance and continual improvement.
- Tracking compliance with legal requirements is an obligation under ISO 14001.
- A test result is only as good as the integrity of the sample on which it is made, and on the accuracy of calibration of the measuring equipment.
- Everything that ISO 14001 says must be maintained, must be monitored or measured.