GUIDELINES ON ENVIRONMENTAL MANAGEMENT SYSTEMS

Doc 107/25

Revision of Doc 107/17

EUROPEAN INDUSTRIAL GASES ASSOCIATION AISBL

AVENUE DE L'ASTRONOMIE 30 • B – 1210 BRUSSELS
Tel: +32 2 217 70 98
E-mail: info@eiga.eu • Internet: www.eiga.eu

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Disclaimer

EUROPEAN INDUSTRIAL GASES ASSOCIATION AISBL
Avenue de l'Astronomie 30 B 1210 Brussels Tel +32 2 217 70 98
E-mail: info@eiga.eu Internet: www.eiga.eu

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Amendments to 107/17

Section	Change
All	Updated references to ISO 14001 - 2015 Environmental management systems
All	Updated to latest EIGA style for format and content.
3.1	Publications terminology added

Technical changes to last version are underlined

1 Introduction

This publication provides a guide to implementation of an environmental management system according to ISO 14001 - 2015 Environmental management systems - Requirements with guidance for use [1] [1].

2 Scope and purpose

2.1 Scope

This publication provides guidance on environmental management system implementation relevant to the Industrial Gases Industry.

2.2 Purpose

The objective is the process of enhancing the environmental management system to achieve improvements in overall environmental performance.

3 Definitions

3.1 Publications terminology

3.1.1 Shall

Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should

Indicates that a procedure is recommended.

3.1.3 May and need not

Indicate that the procedure is optional.

3.1.4 Will

Is used only to indicate the future, not a degree of requirement.

3.1.5 Can

Indicates a possibility or ability.

3.2 Technical definition

3.2.1 Environmental aspect

These are elements of an organization's activities, products or services that interact or can interact with the environment. For example, use of energy or transportation of products.

3.2.2 Environmental impact

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects. (Source: ISO 14001:2015) [1]. For example: the contamination of water with hazardous substances or the reduction of air emissions.

[1] References are shown by bracketed numbers and are listed in order of appearance in the reference section

4 Environmental management system implementation

4.1 Links to other EIGA publications

This publication covers in detail the environmental management system. There are several linked EIGA publications that provide more details on general environmental issues, legislation for the gas industry and operational good environmental practices. A list of these linked publications and their links to the ISO 14001 environmental management systems standard is provided in Appendix A [1].

4.2 Background

The ISO 14001 Standard shares common management system principles with the ISO 9000 series of quality system standards (Appendix B) [1]. Therefore, the existing management system consistent with the ISO 9000 series should be used as a basis for the environmental management system. New versions of these standards are issued with the aim of enhancing the compatibility of the two standards for the benefit of users see Appendix B. The environmental management system model is shown in Appendix C.

4.3 Initial environmental review

To assess the current position of the organization regarding environmental management system requirements and the impact of a site's activities, an initial environmental review is necessary; a comprehensive analysis of the environmental management system and the issues, impacts and performance of activities at a site. The focus is the installations on site. These will be listed in a catalogue of installations (Appendix D).

The legal and other requirements are directly dependent on the activities conducted on the site and (hazardous) substances present. When using the checklists, it is necessary to verify that the answers are correct and the systems and procedures in place are working and complied with by looking at the documentation and inspecting/sampling the results.

For an extensive initial environmental review, it is necessary to review a number of records and documents, for example:

- Maps and plans of the site, including drainage systems, and surroundings (geological, hydrogeological) (circa. 5 km radius).
- History and past operations of the site and surroundings.
- Plans showing the location of filling stations, wash bays, pipelines, internal roads, buildings and production workshops. The buildings will be listed in the catalogue of installations (Appendix E).
- Process flow diagrams and mass and energy balances.
- Rraw materials, auxiliary materials, fuels, products, hazardous substances, quantity of waste, energy and water use.
- Safety data sheets.
- Applicable laws, regulations, licenses, permissions.
- Incident records.
- Inspection, maintenance and calibration records.
- Organization plans.
- Information about emergency and crisis preparedness and response.
- Training plans and records for employees and contractors.
- Contractor and supplier information including waste management contractors.

(See Appendix D for checklists)

In an internal audit at the end of the initial environmental review, the current position with respect to the ISO 14001 standards, the legal environment in which the organization is operating, and the significant environmental impacts of activities, products and services will be reviewed [1].The review should focus on:

- Examination of existing environmental management practices and procedures;
- Identification of environmental impacts and their priority for control; and
- Identification of legal and regulatory requirements.

4.4 Next Steps

According to Clause 4 of ISO 14001:2015 [1] as specified in Appendix A, the organization shall identify all internal and external issues that are relevant and that affect the ability to achieve an effective management system. Also, organizations shall understand the needs and expectations of interested parties and determine the boundaries and applicability of the environmental management system to establish its scope.

The organization shall demonstrate leadership and commitment of top management to the environmental management system, according to Clause 5 [1].

Following the initial review, the results are used to formulate the environmental policy of the site or organization in accordance with Clause 5.2 of ISO 14001 [1].

There is then a planning step where the organization shall identify all risks and opportunities related to environmental aspects, compliance obligations and other issues and requirements. After that, the formal registers of environmental aspects and compliance requirements shall be established. Guidance on the main environmental impacts of gas industry processes are given in separate publications (see Appendix A). Before setting objectives and plans for continuous improvement, the organization needs to plan to take actions to address significant environmental aspects compliance obligations and risks and opportunities (Clause 6 Planning [1]). These steps are fully covered in the ISO 14001 standards and guidance [1]. These objectives and targets are then measured by key performance indicators (KPIs) and some further guidance on relevant KPIs for the industrial gas industry is given in Section 4.5.

Environmental management plan(s) are then established with the relevant documentation covering control methods and procedures. The management system can then be put into operation, beginning the cycle of control, monitoring, auditing and review as shown in Appendix B. Specific guidance on auditing is covered in EIGA Doc 102 *Auditing Guidelines* [3].

The organization shall determine and provide the resources needed for the establishment, implementation, maintenance and continual improvement of the environmental management system (Clause 7-Support [1]). Also, it should determine the necessary competences to maintain awareness among all persons in the organization.

Following Clause 8 [1], the organization shall establish, implement, control and maintain the processes needed to meet environmental management system requirements. Also, organizations shall establish, implement and maintain the processes needed in potential emergency situations.

4.5 Selection of environmental key performance indicators

The measurement and monitoring of environmental performance is a key aspect of any environmental management system.

Objectives and targets should be set once the company's or site’s significant environmental aspects and impacts have been identified (see the previous Section 4.4).

That should be done in a structured and comprehensive way to ensure that all relevant facts are considered. The significant environmental aspects should then be the baseline when deciding how to monitor the environmental performance of an organization. This follows from the initial review (see Section 4.4) and also from consultation with other EIGA publications covering the various industrial gases processes (see Appendix A).

Many companies and associations are adopting environmental measures to track their environmental performance and to report these as KPIs to key stakeholders such as employees, shareholders, local communities and the general public as deemed appropriate by the organization

For example, the international standard ISO14031 - *Environmental management - Environmental performance evaluation - Guidelines* could be considered when selecting environmental indicators [4].

Some examples of relevant indicators that could be used for the industrial gas industry are given in Appendix E. These are provided as examples only and it is up to each organization to decide which indicators best fit their needs.

Initiatives such as the EU Eco Management and Audit Scheme (EMAS) and mandatory sustainability reporting can only increase the pressure on all organizations to report their environmental performance. When using environmental KPIs across national and international boundaries it is important to establish common definitions for benchmarking. For example, legal definitions of hazardous waste may vary internationally.

4.6 Training

The company shall organize the training of its own and its contractors' personnel e.g. by:

- identifying training needs;
- defining goals;
- identifying receivers, defining contents, identifying methods and instruments;
- planning activities;
- leading activities; and
- verifying results.

Benefits are:

- motivation of employees;
- improved control of emissions;
- reduction of associated costs;
- improved reporting of environmental incidents;
- improved image/relationship with authorities and ecological organizations; and
- alignment with environmental management systems.

Nine packages are available from EIGA:

- TP 1 Introduction to Environmental Issues in the Industrial Gases Industry.
- TP 2 ASU Plants Environmental Issues;
- TP 3 Acetylene Plants Environmental Issues;
- TP 65 Cylinder & CO2 Plant Environmental Issues;
- TP 5 Distribution Environmental Issues;
- TP 19 Hydrogen Plants Environmental Issues;
- TP 20 Customer Installations Environmental Issues; and
- TP 21 Nitrous Oxide Plant - Environmental Issues.

Training modules are aimed at plant personnel, managers, supervisors and staff.

These modules constitute the awareness training package for general environmental problems relevant to the industrial gases industry and are based around the information and best practices provided in this publication.

Training should also include the applicable legal requirements for the specific site.

After analysis of the results achieved or when substantial changes occur (e.g. plant modification, utilization of a new substance, introduction of new procedures, changes to personnel), training should be updated. A default frequency of 1 year is suggested.

4.7 Environmental emergency and crisis management

Potential impact of emergency situations on the environment:

- surface and ground water;
- air (fugitive emissions, spills);
- soil: disposal of wastes (liquids/solids);
- asbestos;
- noise;
- ozone depletion;
- global warming;
- PCBs;
- flora and fauna; and
- people.

Emergency prevention:

- analysis of processes and plant construction based on legislation, codes, standards;
- definition of procedures to operate in safety conditions;
- material safety data sheets;
- risk assessments to reduce incidents/accidents ;
- elimination/reduction of waste at source; and
- recycling, treatment, final disposal.

Emergency management:

- emergency plan to control internal and external events;
- evaluation of substances in stock;
- specifications of processes and plants;
- control of material handling, transport, distribution; and
- Information on personnel, authorities, local community.

People charged with crisis control:

- company officers;
- emergency/ crisis coordinator;
- emergency team; and
- communication coordinator.

Details:

- prepare a complete company profile: location, activity, number of workers, products;
- prepare a complete description of the surrounding area, with cities, schools, hospitals, community halls, routes;
- prepare internal & external emergency procedures;
- prepare standard modules of communication with technical information to be relayed to the local community by the media;
- prepare a schedule with telephone numbers of the following persons charged with emergency management:
  - director
  - coordinator;
  - product specialist;
  - fire brigade;
  - public security;
  - medical assistance;
  - city mayor;
  - legal representative; and
  - environmental manager.
- test the emergency and crisis plans on a regular basis.

4.8 Use of suppliers and contractors

Items to consider when selecting contractors are:

- pre-qualification evaluation of contractor's capabilities;
- provision for dealing with environmental requirements such as waste disposal, spill clean-up and appropriate training, emergency cover;
- sourcing activities of contractor ability; (not sure what this means?)
- formal contract should be agreed to establish environmental requirements; and
- environmental KPI's. (why is this underlined?)

5 References

Unless otherwise specified, the latest edition shall apply.

[1] ISO 14001 Environmental Management Systems - Requirements with guidance for use www.iso.org

[2] ISO 9001 Quality Management systems – Requirements www.iso.org

[3] EIGA Doc 102 Audit guidelines www.eiga.eu

[4] ISO 14031 Environmental management – Environmental performance evaluation – Guidelines www.iso.org.

[5] ISO 45001 Occupational Health & Safety Management Systems – Requirements with guidance for use www.iso.org

[6] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on Waste https://eur-lex.europa.eu/

Appendix A—EIGA publication links to ISO 14001-2015 (Informative)

Doc No	Title of EIGA Publication	ISO 14001:2015 SECTIONS	Clause
107	Guidelines on Environmental Management Systems [1)]	Context of the organization	4
		Understanding the organization and its context	4.1
		Understanding the needs and expectations of interested parties	4.2
		Determining the scope of the environmental management	4.3
		Environmental management system	4.4
		Leadership	5
		Leadership and commitment	5.1
		Policy	5.2
		Organization roles, responsibilities and authorities	5.3
		Planning	6
		Actions to address risks and opportunities	6.1
		General	6.1.1
106	Environmental Issues Guide [1)]	Environmental aspects	6.1.2
108	Environmental Legislation Applicable to Industrial Gases Operations within the EU [1)]	Legal requirements and voluntary obligations	6.1.3
		Environmental objectives and planning to achieve them	6.2
		Environmental objectives	6.2.1
		Environmental improvement programmes	6.2.2
		Support	7
		Resources	7.1
		Competence	7.2
		Awareness	7.3
		Communication	7.4
		General	7.4.1
		Internal communication	7..4.2
		External communication and reporting	7.4.3
		Documented information	7.5
		General	7.5.1
		Creating and updating	7.5.2
		Control of documented information	7.5.3

Doc No	Title of EIGA Publication	ISO 14001:2015 SECTIONS	Clause
88	Good Environmental Management Practices for the Industrial Gas Industry [1 and 2)]	Operation	8
30	Disposal of Gases		
85	Noise Management for The Industrial Gases Industry [1)]		
109	Environmental Impacts of Acetylene Plants		
84	Calculation of Air Emissions from Acetylene Plants		
05	Guidelines for the Management of Waste Acetylene Cylinders		
166	Guidelines on Management of Gas Cylinders		
94	Environmental Impacts of Air Separation Units		
110	Environmental Impacts of Cylinder Filling Plants	Operational planning and control	8.1
117	Environmental Impacts of Customer Installations		
101	The Carbon Dioxide Industry and the Environment		
106	Environmental Issues Guide		
111	Environmental Impacts of Carbon Dioxide and Dry Ice Production [2)]		
122	Environ. Impacts of Hydrogen Plants		
112	Environ. Impacts of Nitrous Oxide Plants		
113	Environmental Impacts of Transportation of Gases		
137	Environmental Aspects of Decommissioning		
		Value chain planning and control	8.2
		Emergency preparedness and response	8.3
		Performance evaluation	9
		Monitoring, measurement, analysis and evaluation	9.1
		General	9.1.1
		Evaluation of compliance	9.1.2
135	Environmental Auditing Guide [1)]	Internal audit	9.2
		Management review	9.3
		Improvement	10

Doc No	Title of EIGA Publication	ISO 14001:2015 SECTIONS	Clause
		Nonconformity and corrective action	10.1
		Continual improvement	10.2

NOTES

1 Specific publication relevant to CO_2 and dry ice.

2 General publication useful to CO_2 and dry ice.

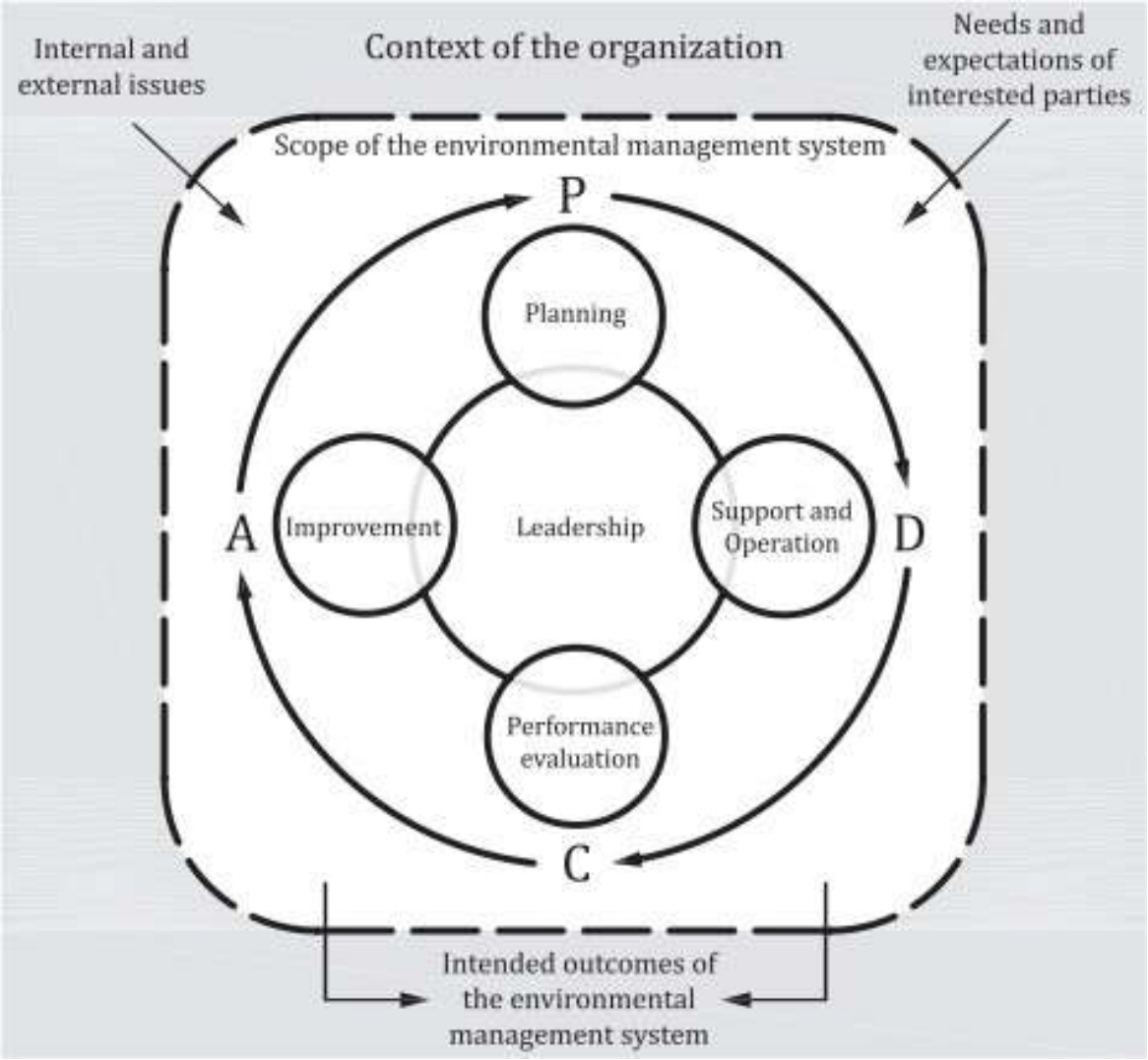
Appendix B—Comparison of different management systems standards (Informative)

Requirements	Quality ISO 9001:2015 [2]	Environment ISO 14001:2015	Safety ISO 45001:2018 [5]
Context of the organization	4	4	4
Understanding the organization and its context	4.1	4.1	4.1
Understanding the needs and expectations of interested parties	4.2	4.2	4.2
Determining the scope of the environmental/Quality/Safety management system	4.3	4.3	4.3
Environmental/Quality/Safety management system	4.4	4.4	4.4
Leadership	5	5	5
Leadership and commitment	5.1	5.1	5.1
Environmental/Quality/Safety policy	5.2	5.2	5.2
Organizational roles, responsibilities and authorities	5.3	5.3	5.3
Participation of workers			5.4
Planning	6	6	6
Actions to address risks and opportunities	6.1	6.1	6.1
General	6.1.1	6.1.1	6.1.1
Environmental aspects/hazard identification	6.1.2	6.1.2	6.1.2
Compliance/legal obligations	6.1.3	6.1.3	6.1.3
Planning action	6.1.4	6.1.4	6.1.4
Environmental /Quality/Safety objectives and planning to achieve them	6.2	6.2	6.2
Environmental/Safety objectives	6.2.1	6.2.1	6.2.1
Planning actions to achieve environmental/safety objectives	6.2.2	6.2.2	6.2.2
Planning of changes	6.3		
Support	7	7	7
Resources	7.1	7.1	7.1
Competence	7.2	7.2	7.2
Awareness	7.3	7.3	7.3
Communication	7.4	7.4	7.4
General		7.4.1	7.4.1
Internal communication		7.4.2	7.4.2
External communication		7.4.3	7.4.3

Documented information	7.5	7.5	7.5

Requirements	**Quality ISO 9001:2015**	**Environment ISO 14001:2015**	**Safety ISO 45001:2018**
General	7.5.1	7.5.1	7.5.1
Creating and updating	7.5.2	7.5.2	7.5.2
Control of documented information	7.5.3	7.5.3	7.5.3
Operation	8	8	8
Operational planning and control	8.1	8.1	8.1
Emergency preparedness and response		8.2	8.2
Requirements for products and services	8.2		
Design and development of products and services	8.3		
Control of externally provided processes, products and services	8.4		
Production and service provision	8.5		
Release of products and services	8.6		
Control of nonconforming outputs	8.7		
Performance evaluation	9	9	9
Monitoring, measurement, analysis and evaluation	9.1	9.1	9.1
General	9.1.1	9.1.1	9.1.1
Evaluation of compliance		9.1.2	9.1.2
Customer satisfaction	9.1.2		
Internal audit	9.2	9.2	9.2
General	9.2.1	9.2.1	9.2.1
Internal audit programme	9.2.2	9.2.2	9.2.2
Management review	9.3	9.3	9.3
Improvement	10	10	10
General	10.1	10.1	10.1
Nonconformity and corrective action/incident	10.2	10.2	10.2
Continual improvement	10.3	10.3	10.3

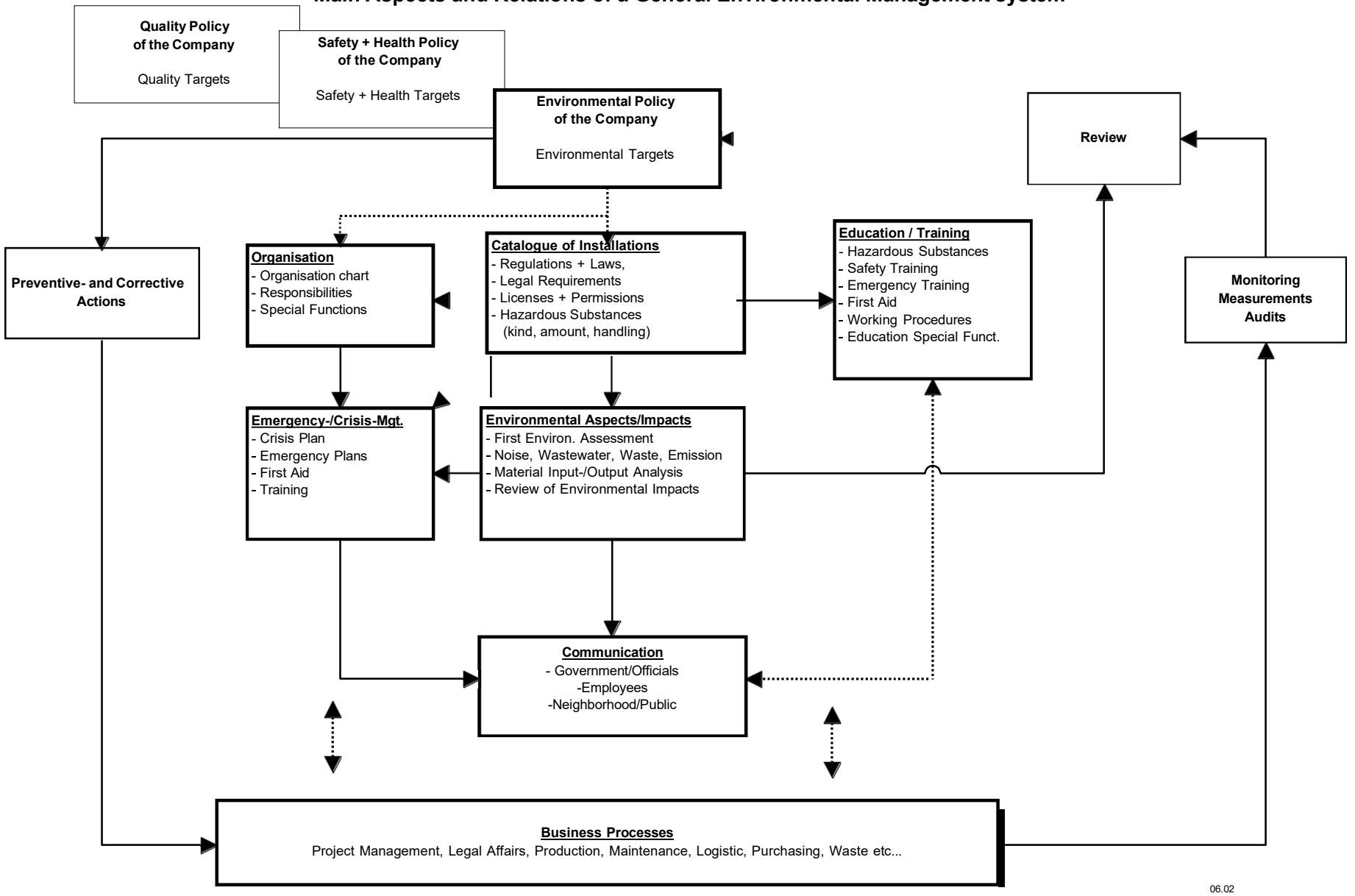
Appendix C—Environmental management system requirements (ISO 14001) (Informative)


Internal and external issues
Context of the organization
Needs and expectations of interested parties
Scope of the environmental management system
P
Planning
A
Improvement
Leadership
Support and Operation
D
Performance evaluation
C
Intended outcomes of the environmental management system

Appendix D—How to conduct an initial environmental assessment - general guidance (Informative)

1. Commitment of the Top Management - Environment is a company priority
2. Set up of an implementation team - Project management skills are necessary
3. Preparation and communication of environmental policy
4. Identification of legal and other requirements
5. Analysis of environmental key roles, responsibilities and authorities
6. Identification and evaluation of environmental aspects, related operations and activities - Systematic data evaluation
7. Setting of programs and plans and selection of relevant key performance indicators
8. Identification of operational controls, monitoring and measurement needs. Links to performance indicators
9. Establish procedures for corrective/preventive action, control of documents and records - Perform emergency preparedness and response
10. Establish operational controls and monitoring processes
11. Definition of job-specific roles and responsibilities - Competence , Initial employee awareness / specific employee training
12. Preparation of the steering documents as part of integrated management system (manual)
13. Internal Audits / Management reviews

Main Aspects and Relations of a General Environmental Management system



SHEQ-Management	Model **Catalogue of installations**	

no.	Building	Documentation Kind of licence, Permission ...	Authority	Documentation Reference number	Documentation Date of issue	Documentation Depository	inspection control	
	Filling station argon - Storage tank - Filling rack(s)							
	Filling station nitrogen - Storage tank - Filling rack(s)							
	Filling station oxygen - Storage tank - Filling rack(s) -							
	Cylinder storage							
	...							

Hazardous Substances

Installation / activity: _____

Responsible: _____

		Remarks (required)
Do you know the legal requirements in the permit?	Y / N	
Is there a list / register of all hazardous substances in use?	Y / N	
Do you have safety data sheets for all hazardous substances in use?	Y / N	
Are operating instructions present for all hazardous substances in use?	Y / N	
Do the regulations define the interval of inspections (e.g. annually)?	Y / N	
Do the regulations specify how long to store the records (e.g. 2 years)?	Y / N	

Storage

Installation / activity: _____

Responsible: _____

Do you know the legal requirements in the permit?	Y / N	Remarks:
Plan and inventory	Y / N	
Secondary containment?	Y / N	
Routine inspection?	Y / N	
Weather protection?	Y / N	
Material and product compatibility?	Y / N	
Safety distance and separation?	Y / N	

Date: _____ Signature: _____

Transport

Installation / activity: _____

Responsible: _____

Do you know the legal requirements in the permit and ADR requirements?	Y / N	Remarks:
Do you know your dangerous goods safety advisor?	Y / N	
Emergency arrangements and equipment?	Y / N	
Logistics planning?	Y / N	

Product	Quantity	Package (Bulk/drum /cylinder	Means of transportation	Number of transports

Date: _____Signature: _____

Noise

Installation / activity: _____

Responsible: _____

		Remarks
Do you know the internal legal requirements and for the local area?	Y / N	
Do you know the sources of noise?	Y / N	
Are there activities with ear protection in use?	Y / N	
Do you have noise assessment reports (internal and boundary)?	Y / N	
Are there employees complaining about noise?	Y / N	
Have you information about complaints from neighbors?	Y / N	

Date: _____ Signature: _____

Installation / activity: _____

Responsible: _____

INPUT

Raw materials Commercial products	Auxiliary material	Fuels	Energy consumption Water consumption

Production / activity

- ☐ **Site**
- ☐ **Plant**
- ☐ **Process**
- ☐ **Engine**

OUTPUT

Products Commercial products	Hazardous waste / other waste	Waste water Cooling water	Emissions to air

Date: _____Signature: _____

Emissions to air

Installation / activity: _____

Responsible: _____

Do you know the legal requirements in the permit? Y / N Remarks:

Defined sources (for example chimney, ventilation):	Contents of the waste air (type of pollutant vs permit requirements)	Volume flow / Mass flow	Temperature
Diffuse emissions (for example VOC)			

Date: _____Signature: _____

Waste

Installation / activity: _____

Responsible: _____

EWC number	Quantity / year	Costs / year	Classification of the waste - Hazardous waste - Non hazardous - Other waste	Proof/ Documentation Waste transfer note

Date: _____Signature: _____

Use of water / wastewater

Installation / activity: _____

Responsible: _____

Do you know the legal requirements in the permit?	Y / N	
Do you know the position and condition of the site drainage?	Y / N	
Use of water? for example cooling water	Y / N	
Existing sewage systems: for example oil separator	Y / N	
Constitution of the wastewater? Hazardous substance? Temperature?	Y / N	
Water consumption? m^3/h or m^3/Charge	Y / N	
Costs of fresh water?	Y / N	
Costs of wastewater?	Y / N	
Monitoring system?	Y / N	
Risk assessment for accidental discharges?	Y / N	
Discharge direct or to treatment works?	Y / N	

Date: _____Signature: _____

Appendix E—Environmental KPI's

Management

Measurement of the existence and implementation of an environmental policy is an indication of management commitment to improving environmental performance. Ideally the policy should be communicated to everyone and should be implemented throughout the organization.

Measures that could be used include:

- % of sites with an environmental policy in line with the group policy;
- % of the procedures with relevant influence on the environment implemented in the operations;
- % of companies/sites with an Environmental Management System, if applicable certified/registered to ISO 14001 or EMAS [1].

The number of performed environmental audits made by either the group staff specialist or the company's specialist gives a measure of the environmental protection activity.

The number of fines due to violation of environmental legislation gives an indication of the environmental risk and whether the process is under control or not.

Another measure of environmental risk is the identification of potential air, water or soil contamination from past and current operations.

Incidents

The number and severity of environmental events or incidents are a measure of operational control. Corrective actions for non-conformities are a way of demonstrating that a structured management system exists. These can include:

- number of incidents with environmental impact;
- number of justified complaints from the public due to the operation's environmental impact;
- number of justified complaints from the public due to noise.

Material use

Use of hazardous materials is an environmental issue. If possible, hazardous materials should be replaced by less hazardous ones.

Monitoring the quantities of hazardous materials enables reduction targets to be set. In the event that phase-out of a substance is specified by legislation it is good practice to know the organization's progress to achieving the phase-out so that expenditure can be planned.

The following are some examples of the types of substance relevant to the industrial gas industry:

- Amount of CFC and CFC mixtures bought, used or sold. List all applications. The amount should be expressed in kg of pure CFC.
- Inventory of CFC a) In process equipment b) In air conditioning units, etc. Estimate the amount in air conditioning units, cooling machines, etc. owned by the company.
- Inventory of HCFC (see previous entry for CFC).
- Inventory of Halons a) portable fire extinguisher b) fixed fire extinguishing system.
- Inventory of PCB.
- Inventory of asbestos (insulation material, gasket, glues for cryogenic applications, concrete plates, building materials).
- The number of underground storage tanks and an estimate of their condition. List substance (oil, acetone, propane, etc.) stored. Classify the tank condition (risk of leakage) e.g. % of double walled tanks.

Use of Resources

Resources such as energy and water are important from an environmental and cost viewpoint. Measurement of these factors enables the most efficient use of these resources to be established and monitored. The factors that could be considered are:

- average energy consumption per m^3 produced gas. (A standardized production must be defined to compensate for liquid/gaseous plant, nitrogen/oxygen balance etc.);
- water consumption at each ASU, cylinder testing carbon dioxide, nitrous oxide and acetylene plant respectively expressed as m^3 fresh water/ m^3 gas produced or cylinders tested;
- heating efficiency of buildings kWh/ heated building volume;
- the utilization efficiency of carbide expressed as kg acetylene / kg carbide;
- % of transport volume on railway, ship or pipeline;
- transport efficiency, kg delivered product or cylinders /km driven by truck;
- average fuel consumption for a) liquid trucks and b) cylinder trucks in liters of fuel / ton x km of delivered product weight of cylinders included.

Waste

Waste products represent a waste of money and resources. As well as the disposal costs there are associated administration costs and legal risks. In addition waste materials are often products that could have been sold. Some typical measurements are:

- non-hazardous waste in tons a) in total b) % collected for recycling (List recycled waste)
    - number of disposed gas cylinders
- hazardous waste in tons for example:
    - oil annually;
    - organic solvents annually;
    - stored acetylene cylinders for scrapping (number of cylinders) especially pre 1990 cylinders;
    - stored lime/lime sludge not in production bins;
    - any other hazardous waste

NOTE: Hazardous waste is defined according to Council Directive **2008/98/EC** [6].

Emissions to air

Air emissions can have an impact on quality of life due to the formation of smog, and through longer- term problems such as acid rain. In particular the following areas could be targeted:

- emissions of Volatile Organic Compounds (VOCs), mainly;
    - organic solvents for general purposes in kg
    - acetylene emitted per produced kg of product
    - VOC emission in kg/painted cylinder (the emission should be estimated by purchased kgs - storage differences - solvent in hazardous waste);
- the amount of CFC and HCFC respectively released to the atmosphere. The added volume at maintenance;
- % of truck and car fleet using alternative fuels with less environmental impact. Examples: LNG trucks/cars, “green” diesel, etc. for example by comparing carbon dioxide equivalent of the fuel;
- % of contracted trucks using alternative fuels with less environmental impact;
- % of contracted trucks according to Euro 5 and Euro 6 standard. These standards require reduction of NOx- emissions by using a urea solution (AdBlue/ Air1), respectively 70 and 90 % reduction in NOx-emissions.