Safety, Health and Environmental Annual Report 2007

EC Joint Research Centre Institute for Energy
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JRC
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Institute for Energy

The Institute for Energy provides scientific and technical support for the conception, development, implementation and monitoring of community policies related to energy. Special emphasis is given to the security of energy supply and to sustainable and safe energy production.

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GLOSSARY

	Dutch	English
CPR	Commissie voor de Preventie van Rampen door gevaarlijke stoffen	Committee for the prevention of disasters by dangerous goods: old guideline for storage of dangerous goods
HFR	High Flux Reactor	High Flux Reactor
HSC	Health and Safety Committee	Health and Safety Committee
IE	Institute for Energy	Institute for Energy
INO	Interne Noodorganisatie	Internal Emergency Plan
ISO	International Organisation for Standardisation	International Organisation for Standardisation
JRC	Joint Research Centre	Joint Research Centre
KFD	Kernfysische Dienst	Department of Nuclear Safety, Security and Safeguards
NRG	Nuclear Research and Consultancy Group	Nuclear Research and Consultancy Group
OHSAS	Occupational Health and Safety Management System	Occupational Health and Safety Management System
OLP	Onderzoeks Locatie Petten	Research Location Petten
PGS	Publicatiereeks Gevaarlijke Stoffen	Publication Series for Dangerous Goods: new guideline for storage of dangerous goods
TIP	Technisch Informatie Pakket	Technical Information Package
VROM	Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer	Ministry of Housing, Spatial Planning and the Environment

PURPOSE

This document is the integrated safety and environmental annual report 2007 of the JRC-IE. The report describes safety and environmental activities, targets, impacts and the management system of the Institute. This report is published annually.

SAFETY AND HEALTH

Background

Over the last couple of years Safety, Health and Well-Being has received continuous attention and a high priority within the European Commission and the Institute for Energy. In 2006 the European Commission adopted the Decision (C(2006)1623) on 'Establishing a Harmonised Policy for Health and Safety at Work for all Commission staff' to have a general and uniform approach in this area throughout the Commission.

The Institute has started with the implementation of this Commission Decision and the first steps have been taken in 2006. As an example we would like to mention the development of a Safety Management System similar to the Environmental Management System of the Institute.

Inspections and audits

At the Institute, various inspections and audits were held by internal and external bodies and persons.

The Director, Heads of Unit, Safety-Environment-Security Sector and internal auditors are examples of the IE personnel involved.

External inspections were performed on several occasions by the Medical Service of the European Commission (Luxembourg), auditors from a certifying body, the municipality and other inspection services of national authorities. Inspection reports were always followed by action plans where applicable.

In 2007 the following inspections were performed related to safety matters:

	Frequency
Internal inspections	
Safety Tours (inspection by Unit Head and Site Safety Officer)	8
Medical Service	8
External inspections	
Milieudienst Kop van Noord-Holland *(Environmental Service)*	2
VROM Kernfysische Dienst *(Department of Nuclear Safety, Security and Safeguards)*	1
Arbeidsinspectie *(Labour Inspectorate)*	2

Joint Committee on Safety and Health at Work

The Committee on Safety and Health at Work (HSC) of the Institute is comprised of a Chairman, Vice-Chairman, secretary and 6 staff members and their replacements, designated equally by the Local Staff Committee and the Director General. The main task of the committee is to advise the Director on health, safety and well-being matters. Meetings were planned once a month with the exception of the main holiday periods. The Committee had 10 meetings in 2007.

The Committee has issued several opinions in 2007 which are listed in the table below:

Opinion nr.	Subject	Date of issue	Issued to
O 07-01	Review working conditions of the experimental facilities in building 310	23-Jan	Director
O 07-02	Personal Protective Equipment experimental facilities building 310	23-Jan	Director
O 07-03	Prevention check-up in Alkmaar hospital	23-Jan	Director
O 07-04	Statistics on sickness and accidents	20-Feb	Director
O 07-05	Communication on accidents	21-Jun	Director
O 07-06	Lighting in offices	05-Jul	Director
O 07-07	JRC Health and Safety at Work Annual Report 2006	08-Nov	Director
O 07-08	Safety system and emergency preparedness documents	14-Dec	Director

Safety related activities

The annual meeting of the JRC fire prevention and protection experts was held at the Institute. Participants from Belgium, Spain, and Germany were sharing experiences and ideas on fire prevention and protection. Their intention is to get a uniform approach and standard with respect to fire safety at the different sites of the JRC. They also evaluated the Internal Emergency exercise held at the Institute.

During the renovation of buildings 313, 308 and 309 the construction companies were advised on several safety related matters.

Safety related training and instructions

The JRC-IE has organized internal and external training for its staff as shown below.

Course Name	Duration	Number of participants
Radiation Protection		
Health Physic Courses (levels 5, 4, 3 – 28 days total over different courses)	28 days	4
Refresher course held by the Nederlandse Vereniging voor Stralings Hygiëne	2 days	1
Processing, Storage & Disposal of Nuclear Waste	2 days	1
Internal training according Besluit Stralingsbescherming for radiological workers	2 hours	39

Course Name	Duration	Number of participants
Emergency preparedness and first aid		
Emergency Response Team refresher course	1 day	20
Emergency Response Team at the JRC-IE	2 hours	19
Team Leader Emergency Response Team	2,5 days	2
Self Contained Breathing Apparatus Training new user	1 day	4
Self Contained Breathing Apparatus refresher course	2 x 1 hour	10
First Aid and resuscitation refresher course	5 x 2 hours	14
Security		
Training alert system for the prevention of terrorism	1 day	2
Tasks, authorities and responsibilities of security staff	2 days	1
Basic training on bomb scouting	0,5 day	2
Advanced Security & Defensive Driving	1 day	1
Management systems		
Internal Auditor Training OHSAS 18001	1 day	6
Accident investigation	2 days	1
Other		
Jaarcongres Nederlandse Vereniging voor Veiligheidskunde 2007	2 days	1
Symposium "Steigerongeval Amercentrale"		
Explosion safety of installations	2 days	1

Furthermore, each newcomer received general safety instructions specific to the Petten Research Location. Job-specific instructions were given by the Unit/Sector to which he/she belongs. Contractors and external companies working at the JRC-IE received the document “Safety regulations for third parties working at the JRC-IE Petten site” and all external persons working on site have been shown the video ‘General safety regulations at the Research Location Petten’.

The Site Safety Officer provided information on safety related matters during Unit meetings. He also organised so called toolbox meetings to specific groups of staff members like laboratory managers.

Operational emergency preparedness

To increase the emergency preparedness of all staff, evacuation exercises were held twice in all buildings and one for the JRC-IE site. To improve the cooperation between the company emergency staff and the site fire brigade one fire drill was done.

In 2005 the process of reviewing the 'Rampbestrijdingsplan OLP' was started by the municipality of Zijpe. This process was finalised in 2007. As a consequence the site emergency organisation plan was reviewed as well.

Near accidents and accidents

Within the Institute we use an internal reporting system for near accidents and accidents. The purpose of this system is to get information on potential hazards and to improve the health and safety situation continuously. In 2007, 34 near accident/accidents were reported internally.

One nuclear contamination accident was announced to the KFD. This accident has not lead to any harm to people and/or the environment.

Since the implementation of the internal reporting system the number of announcements has increased (8 in 2004, 17 in 2005, 44 in 2006). With 34 announcements this year it seems that the reporting is now accepted within the organisation and a balanced amount of reports are submitted.

Work permits

The work permit system of the Institute was revised in April 2006. This system is a tool to improve the safety and health of workers at work and it covers the following types of work and areas:

Controlled areas	All areas where special instructions based on the possible risks in this area are needed.
Excavation work	For work at which the knowledge of the existence of underground cables, pipes, drain system, etc. is essential.
Naked flame	For work involving the use of naked flame, or other activities involving the risk of fire, or work when dust is created which smoke detectors can see as smoke.
Confined space	Work in confined spaces such as pits, tanks, reservoirs, crawling spaces or spaces with inadequate or no ventilation.
Working on height	For work on height >2.5 m where there is a risk of falling or falling subjects and for activities that can cause falling like opening floors.

The following work permits were given out:

Type of work permit	**2006***	**2007**
Controlled area	5	5
Excavation	24	15
Naked flame	83	42
Confined space	12	6
Working on heights	35	55
Total	159	123

*numbers for 2006 were extrapolated to cover the entire year

Note that some work permits cover more than one day. The number of work permits per year depends on the kind of activities going on at the Institute.

Radiological workers

About 20% of the Institute staff is registered as radiological worker. The measurement and registration of their exposure to ionising radiation is contracted to NRG. All doses were well below the legal limits as defined in the Council Directive 80/836/Euratom and amending Directives.

The total dose of the radiological workers was lower than in the previous year. The reason for this is due to the higher exposure of one person in 2006, nevertheless this dose was well below the legal limit.

The table below shows the data of the cumulative doses. It includes the dose of external staff. About one third of the radiological workers has an annual dose limit of 6 mSv and two third of 20 mSv. For comparison a non-radiological worker (citizen) has an annual dose limit of 1 mSv.

Table *Dose of exposed people*

	Dose (mSv)		Number of persons			
Year	Cumulative	Average	Total	< 1 mSv	1-6 mSv	6-20 mSv
2005	8,46	0,18	47	47	0	0
2006	11,25	0,20	55	54	1	0
2007	6,57	0,12	54	54	0	0

Health related activities

The staff members of the Institute are under the supervision of the Medical Service of the European Commission. In 2007 an additional company doctor was contracted by the Commission. Therefore the frequency of site visits has increased significantly. One task of the company doctor and his staff is to perform the annual medical examinations of all staff, another one is to advice on work related matters.

The assessment and monitoring of work related risk of staff was improved with the implementation of a reviewed workplace exposure sheet.

The gym which was opened in 2006 is frequently used by a large number of staff members. Several different classes like fitness and body balance can be followed during the lunch break or after working time.

The Institute also subsidies participation in a range of external sporting activities organised by the Institute as well as the participation on tournaments and other annual sports events organised between different departments of the European Commission or between Research Institutes.

ENVIRONMENT

Background

The recertification audit of the environmental management system according the ISO standard 14001-2004 was performed by TNO in the beginning of 2007.

TNO performed two audit sessions. In the first audit session two non conformities were noted.

The first non conformity was related to the Environmental Aspects Register. The register was revised in a way that a clear link was made between the aspects and the environmental objectives of IE. The environmental aspects are also included in the project plans. After the correction this non conformity was degraded to a deviation.

The second non conformity was related to the method of internal compliance audit. The auditors proposed that the internal compliance check should detect non compliance internally rather than via external inspections. As a consequence the IE set up a three year plan which includes internal environmental checks to cover applicable articles of the environmental site license.

The overall impression of the external auditors was very positive. In the last years they have seen a marked improvement in many aspects of our activities: housekeeping in laboratories, outside storage areas, product labelling, PR, etc.

The Institute for Energy passed the audit successfully and received the certificate in March 2007.

EMAS

EMAS stands for "Eco-Management and Audit Scheme" and is a voluntary scheme for organisations willing to commit themselves to evaluate and improve their environmental performance. The JRC has indicated that they would like all sites to register for EMAS by June 2010. Prior to this registration all sites should be ISO 14001 certified. The Institute for Energy has been certified for some years now and will continue to improve in this area. The additional registration to EMAS will impose few changes in our way of work and we therefore do not foresee any difficulties.

The main operational changes in 2007

The research activities of the Institute are carried out under the 7th Framework Programme (2007 to 2013). The Framework Programme is the legal basis for the work of the JRC. It is voted by co-decision between Council and Parliament and is a short political document identifying the main priorities. It used to be for 4 years, but for FP7 it will be 7 years for the non-nuclear part.

Due to the new Framework Programme there were no major changes to the activities for the Institute for Energy in 2007.

Renovation

The end of 2007 marked the completion of a renovation project comprising three office buildings dating from the early 60's, with a total surface of 6.000 m². During the last three years these buildings were fully transformed into modern energy-efficient and user-friendly facilities.

Besides proper insulation of the outer shell, most of them were equipped with full-length

aluminium curtain walls of enhanced thermally insulating glass with a heat reflecting coating and a good solar and daylight penetration factor. Special attention was paid to obtain a harmonised picture following a specific colour scheme and emphasizing the arched entrance as new focal point. A new passageway connects the two twin buildings.

In addition, a state-of-the-art climate system for both heating and cooling capacity, combined with a forced ventilation system with energy recuperation, were installed. Because of the more modest chilled water temperature requirements and the enhanced scope for free cooling, climate ceiling systems consume less electricity (up to 15%), have lowered maintenance costs and are widely recognized as a user friendly (no noise pollution), flexible and space saving technology.

An automatic lighting system, with features as infra red detection, daylight compensation and centralised management of common areas, ensures the proper comfort levels regarding light intensity.

Technical installations are connected to an upgraded building management system for advanced automatic control and consumption control.

Inspections and audits

The IE has an audit programme covering a period of 3 years. In this programme it is defined which areas of the environmental licence are covered during the internal audits and inspections.

Internal audits are performed by Directorate-General ADMIN and on DG JRC level. Inspections are also performed together with experts from different authorities. The results of these inspections are taken up in action plans. The progress of these action plans are reviewed periodically.

Next to internal audits and inspections, external audits by a certification body and inspections by authorities were performed. Two sessions of external audits were performed in the frame of the recertification for the environmental management system.

	Frequency
Internal inspections	
Environmental Tours (inspection by Unit Head and Site Safety Officer)	8
Internal Audits per Unit	7
External inspections	
External Audit by TNO	2
Milieudienst Kop van Noord-Holland *(Environmental Service)*	2
VROM Kernfysische Dienst *(Department of Nuclear Safety, Security and Safeguards)*	1
Arbeidsinspectie *(Labour Inspectorate)*	2

Environmental licence

Due to practical reasons the license granted in 2005 had to be adjusted on two subjects:

One was the determination of the amount of waste water disposed off to the sewer. The second article to be changed concerned the storage of substances reacting heavy with water. Here we found an alternative technical solution and applied the principle of equivalence for technical solutions.

There were no environmental accident announcements according to Environmental Act art. 8.19. Due to the enlargement of a test facility a notification in form of a Technical Information Package (TIP) was submitted to the Municipality.

As part of the implementation of the environmental site licence an energy scan was performed in 2007. As a result of this scan several improvement recommendations were done. The final report was communicated to the Municipality and accepted. The internal process is launched to implement the recommendations presented in the report.

Environmental incidents, significant malfunctions

In 2007 there were no reports of environmental relevant incidents or malfunctions of installations.

Environment related goals

Long-term environmental goals are set for a in the Environmental programme 2006-2008. The specific goals for 2008 are fixed in the Environmental Annual plan. The goals of 2007 were included in the goals of 2008 if they were not reached yet. The table below shows a description of the remaining goals for 2008.

1	Awareness and risk assessment
1.2	*Information to all staff*
	Bring license requirements sorted by topics to the attention of concerned staff members.
	Address all staff on environmental issues in 2 unit meetings per year.
1.3	*Information to external parties*
	Ensure that third parties receive all relevant environmental instructions of IE.
	Monitor if environmental instructions are followed.
2	Collection, separation, storage, removal and reduction of waste
2.1	*Review the waste management and waste disposal process*
	Give information on collection, separation, storage, removal and reduction of waste to all staff.
	Review waste management and waste disposal contracts to evaluate possibilities to reduce waste.
2.1.4	*Improve the possibility to take samples from the sewerage system in laboratories.*
	Implement the defined new sampling points.
	Define a list of the most used heavy metals. Prepare an instruction to reduce the use of heavy metals and when used how to separate them effectively.
3	Consumption of natural resources
3.1	*Reduce consumption of natural resources*
	Perform an energy scan which should show possibilities for reducing water and energy consumption. Prepare follow-up of actions.
	Evaluate the large-scale consumption installations on site.

ENVIRONMENTAL IMPACTS

ENERGY

Table *Consumption of gas and electricity*

Year	Gas (m3) (excl. HFR)	Gas CO2 emission (tonnes)	Electricity (kWh) (excl. HFR)	Electricity CO2 emission (tonnes)	Nr. days with temperature < 0°C
2005	440 662	784	2 588 599	1465	51
2006	455 356	811	2 804 447	1587	62
2007	439 594	782	2 908 900	1646	37

AIR

The emissions to air originate mainly from test facilities in laboratories. These emissions are very low and where possible the laboratory managers are informed of ways to reduce the amount of emissions. In 2007 there were no emissions of substances to air which were above the legal limits.

VOS Estimate

Ethanol: 33 liter
Aceton: 10 liter

This estimate is based on what has been ordered in 2007 and the amount that was still available on site end 2007.

Cooling installations

In 2007 some of the installations have been refilled due to leakages.

	Refill* R22	Refill* R407A	Refill* R134A	R22 inst. removed	R22 installations
2006	64.70 (8)	n.a.	0.50 (1)	2	30
2007	40.90 (3)	1.00 (1)	n.a.	8	22

* Refill in kg equals emission in kg (number of installations where a leakage occurred).

In 2007 several buildings were renovated. Almost all cooling installations from these buildings were decommissioned and replaced by cooling installations which use coolants R407C and R410A.

WASTE

Glass, wood, paper, small chemical waste, chemicals and metal are collected internally at the Institute. Various certified external companies specialized in waste treatment take care of the proper disposal of and the recycling of all valuable materials.

The IE donates empty cartridges to charitable organisations.

Old scientific equipment is often made available to high schools for scientific and education purposes.

Packaging material, like foam chips, is removed from incoming packages and reused (about 2000 litre in 2007).

Wood from different kind of transport packages is reused to make new containers for transport of material and equipment.

Table Type of waste by volume or weight

Type of waste	2005	2006	2007
	Amount	Amount (kg)	Amount (kg)
Household waste	1206 m^3	111360	96000
Paper and cardboard	338 m^3	14292	28780
Wood	44 m^3	7200	4200
Glass	3 m^3	250	1260
Metal	32 m^3	2400	15000
Small chemical:			
Batteries	400	60	70
Cartridges	300 pieces	45 pieces	40 pieces
Laboratory mixed waste	8.3 kg	275	298
Oil filters; oil containing products	23 kg	13	10
Spray containers, paint	16.14 kg	15	22
Developer	0	0	980
Oil	64.1 kg	22	50

Prior to the renovation an initiative was taken to reduce the amount of paper in the central archive. Also staff members were requested to dispose of as much paper as possible before moving to their new/temporary offices. This action resulted in a higher amount of paper that was disposed off then in the last years.

During the execution phase of the renovation waste management is performed by the main contractor.

WATER

The consumption of water in different buildings was measured. However, for the facilities/laboratories in these buildings it is not reasonable to split the water consumption between household water and process water because the water consumption for processes is very low.

The FCTEST facility is the only facility which has a substantial consumption of water in the work process and is located in building 310. The facility has no separate measurement point so it is not possible to divide the household water from the process water.

This FCTEST facility produces water and discharges a part to the air:

Water produced and discharged to sewage: 243 m^3

Water produced and discharged to air: 294 m^3

Due to renovation works on site, building 308 was not in use for a large period in 2007. Temporary building 330 has taken over the function of building 308.

The consumption of water equals the discharge of the water in the sewers, with the difference created by the FCTEST facility.

Table Water balance in m^3

Building	2005	2006	2007
Total	3334	4575	4407
113	n.a.	39	51
300	n.a.	239	174
308	n.a.	348	142
309	n.a.	129	340
310 (incl. FCTEST)	n.a.	1188	982
311	n.a.	0	1
312	n.a.	740	675
313	n.a.	85	51
314	n.a.	127	144
315	n.a.	138	114
320	n.a.	23	17
325	n.a.	145	184
330	n.a.	323	283
Building site	n.a.	144	366
Bluswater	n.a.	907	884

Emission to water

Table Release of heavy metals to the drain system

Metal	Concentration (mg/m^3)		
	2005	2006	2007
Cadmium (Cd)	< 0.4	< 0.4	< 0.4
Chromium (Cr)	< 5.0	< 5.0	< 5.0
Copper (Cu)	64	64	51
Nickel (Ni)	< 5.0	< 5.0	< 5.0
Lead (Pb)	< 5.4	< 5.0	< 5.0
Zinc (Zn)	100	110	69
Mercury (Hg)	< 0.1	0.24	< 0.1
Arsenic (As)	< 2	2	< 2

Table Inorganic emissions to the drain system

Substance	Concentration (g/m^3)		
	2005	2006	2007
Chloride(Cl^-)	200	180	290

SOIL

Considering that the soil investigation campaign of 2004 showed a generally good quality of the soil in the area of the Institute (apart from the two locations where we intervened) no further actions have been taken on this issue.

STORAGE OF DANGEROUS SUBSTANCES AND GASES

The chemicals and gases are stored according to the CPR 15 and the environmental licence. The capacity has not changed significantly during 2007. The storage facilities are maintained according to schedule.

IE has been in consultation with the Municipality to transfer from the CPR to PGS standard. This will be realised in 2008.

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Abstract
The Safety, Health and Environmental Annual Report 2007 describes the health, safety and environmental activities, targets, impacts and management system of the JRC Institute for Energy in Petten.

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.

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