NORTH EAST LINCOLNSHIRE COUNCIL
www.nelincs.gov.uk

Permit with introductory note

Pollution Prevention and Control (England and Wales)
Regulations 2000 (as amended)

Installation address

Ultimate Packaging Ltd
Pegasus Way.
Europarc.
Grimsby
DN37 9TS

Permit Reference: 020062

Contact Details:

Mr Danny Fox
Pollution Control Officer
North East Lincolnshire Council
Freeman House
Freeman Way
Grimsby
North East Lincolnshire
DN32 7AU

Tel: 01472 324787
Fax: 01472 324785

www.nelincs.gov.uk

E-mail **danny.fox@nelincs.gov.uk**

Introductory note

This introductory note does not form a part of the Permit

The following Permit is issued under Regulation 10 of the Pollution Prevention and Control (England and Wales) Regulations 2000 (as amended) (S.I.2000 No. 1973) ("the PPC Regulations") to operate an installation carrying out one or more of the activities listed in Part A to Schedule 1 of those Regulations, to the extent authorised by the Permit.

The permit includes conditions that have to be complied with. It should be noted that aspects of the operation of the installation which are not regulated by those conditions are subject to the condition implied by Regulation 12(10) of the PPC Regulations, that the Operator shall use the best available techniques for preventing or, where that is not practical, reducing emissions from the installation.

Techniques include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned.

Brief description and installation regulated by this permit

The process consists of the printing of food grade packaging.
Solvents are held in two tanks, one of 9,000lts and the second of 6,000lts. The tanks are fully bunded to 110% of their capacity. These tanks are contained in a dedicated room temperature control room.

Inks are stored in a dedicated room with a dedicated ventilation system.
All ink stored is bunded to 110% of its capacity.

Ink is mixed with solvents via the Rexson computerised dispensing system. This sends the mixture directly to the following printers. One CMF press, one Windmoeller & Hoischer press, four F&K presses.

VOC's are removed by the use of a thermal regenerative oxidation plant, which treats exhaust gas streams from all the presses.

Following a print run there may be a need to wash out the ink chambers on the presses. A bicarbonate powder washing facility is used. The system uses dry bicarbonate powder which after the wash cycle is collected as follows.
95% of all solids are collected into a small drum on the machine. These solids consist of bicarbonate powder and ink solids.
5% Ultra fine solids are collected through a self cleaning filter.

All contaminated inks and solvents are processed through the solvent recovery system. Recovered solvent is reused in the processing and

waste from the recovery system is disposed of in sealed drums, through a registered collector of hazardous waste.

Certain processes carried out on site involve the heating of film. The fumes emitted are volatilised polyolefin materials from the process of heat sealing/ perforating polyethylene/polypropylene materials during the production of polyethylene/ propylene flexible packaging.
Emissions from these processes pass through a filtration system and are then vented to atmosphere.

Superseded Licences/Consents/Authorisations relating to this installation		
Holder	**Reference Number**	**Date of Issue**

The Permit requires the Operator to provide information to North East Lincolnshire Council. The Council will place the information onto the public registers in accordance with the requirements of the PPC Regulations. If the operator considers that any information provided is commercially confidential, it may apply to North East Lincolnshire Council to have such information withheld from the register as provided in the PPC Regulations. To enable North East Lincolnshire Council to determine whether the information is commercially confidential, the Operator should clearly identify the information in question and should specify clear and precise reasons.

Variations to the permit

This Permit may be varied in the future. If at any time the activity or any aspect of the activity regulated by the following conditions changes such that the conditions no longer reflect the activity and require alteration, the Regulator should be contacted.

Surrender of the permit

Where an Operator intends to cease the operation of an installation (in whole or in part) the regulator should be informed in writing, such notification must include the information specified in regulation 20(3) of the PPC regulations.

Transfer of the permit or part of the permit

Before the Permit can be wholly or partially transferred to another person, a joint application to transfer the Permit has to be made by both the existing and proposed holders, in accordance with Regulation 18 of the PPC Regulations.

A transfer will be allowed unless the Authority considers that the proposed holder will not be the person who will have control over the operation of the installation or will not ensure compliance with the conditions of the transferred Permit.

Responsibility under workplace health and safety legislation

This Permit is given in relation to the requirements of the PPC regulations. It must not be taken to replace any responsibilities you may have under Workplace Health and Safety legislation.

Appeal against permit conditions

Anyone who is aggrieved by the conditions attached to a Permit can appeal to the Secretary of State for the Environment, Food and Rural Affairs. Appeals must be made in accordance with the requirements of Regulation 27 and Schedule 8 of the PPC regulations.

Appeals should be received by the Secretary of State for Environment, Food and Rural Affairs. The address is as follows:

The Planning Inspectorate
Environmental Appeals Administration
Room 4/19 – Eagle Wing
Temple Quay House
2 The Square, Temple Quay
BRISTOL
BS1 6PN
Tel: 0117 372 8812
Fax: 0117 372 6093

Please Note

An appeal brought under paragraph (1) (c) or (d) in relation to the conditions in a permit will not suspend the effect of the conditions appealed against; the conditions must still be complied with.
In determining an appeal against one or more conditions, the Act allows the Secretary of State in addition to quash any of the conditions not subject to the appeal and to direct the local authority either to vary any of these other conditions.

End of introductory note

Permit issued under the Pollution Prevention and Control Regulations 2000

Permit

Permit Number 02006

North East Lincolnshire Council (the Regulator) in exercise of its powers under Regulation 10 of the Pollution Prevention and Control Regulations 2000 (S.I. 2000 No. 1973) *hereby permits.*

Ultimate Packaging Ltd ("the operator"),

Whose registered office is

Ultimate Packaging Ltd
Pegasus Way
Europarc
Grimsby
DN37 9TS

To operate an installation at

Ultimate Packaging Ltd
Pegasus Way
Europarc
Grimsby
DN37 9TS

to the extent authorised by and subject to the conditions of this Permit and within the boundary identified in condition A

Signed

Tony Neul
Authorised to sign on behalf of
North East Lincolnshire Council

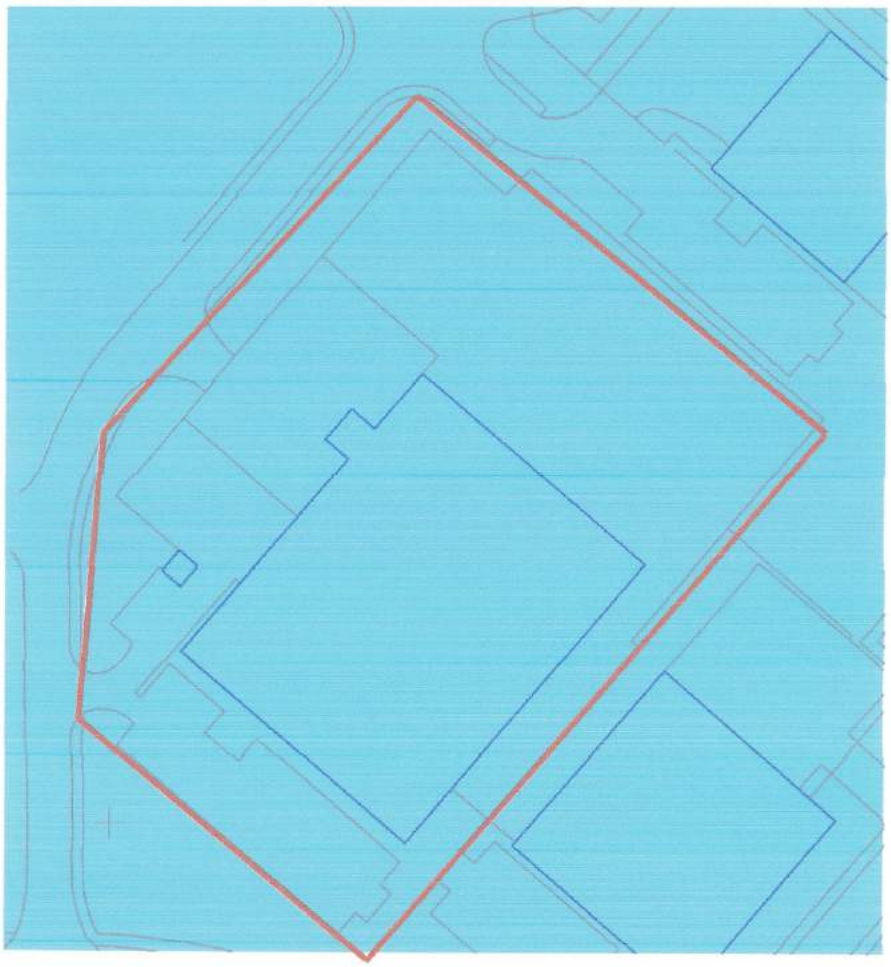
Dated

31/3/06

CONDITIONS

Extent and limit of the installation

A The operator is authorised to carry out the activities and/or associated as specified and within the boundary shown in red on the plan below:-



DESCRIPTION OF AUTHORISED PROCESS

The process consists of the printing of food grade packaging.
Solvents are held in two tanks, one of 9,000lts and the second of 6,000lts. The tanks are fully bunded to 110% of their capacity. These tanks are contained in a dedicated room temperature control room.

Inks are stored in a dedicated room with a dedicated ventilation system. All ink stored is bunded to 110% of its capacity.

Ink is mixed with solvents via the Rexson computerised dispensing system. This sends the mixture directly to the following printers. One CMF press, one Windmoeller & Holscher press, four F&K presses.

VOC's are removed by the use of a thermal regenerative oxidation plant, which treats exhaust gas streams from all the presses.

Following a print run there may be a need to wash out the ink chambers on the presses. A bicarbonate powder washing facility is used. The system uses dry bicarbonate powder which after the wash cycle is collected as follows.
95% of all solids are collected into a small drum on the machine. These solids consist of bicarbonate powder and ink solids.
5% Ultra fine solids are collected through a self cleaning filter.

All contaminated inks and solvents are processed through the solvent recovery system. Recovered solvent is reused in the processing and waste from the recovery system is disposed of in sealed drums, through a registered collector of hazardous waste.

Certain processes carried out on site involve the heating of film. The fumes emitted are volatilised polyolefin materials from the process of heat sealing/ perforating polyethylene/polypropylene materials during the production of polyethylene/ propylene flexible packaging.
Emissions from these processes pass through a filtration system and are then vented to atmosphere.

5 Emission limits, monitoring and other provisions

Non-VOC provisions

5.1 All processes/activities should comply with the emission limits and provisions with regard to non-VOC releases in **Table 4**.

Compliance overview

5.2 For VOC two compliance options are available for all processes / activities.

- Reduction Scheme
- Emission and Fugitive Limits

Non SED activities/processes should apply the provisions of:

- Reduction Scheme; or
- Emission Limits in **Table 5**

In addition to the above, the requirements of the emission limits and conditions for certain designated risk phrase materials (SED Box 6) must be met.

New and substantially changed SED installations, and by the 31 October 2007 existing SED installations should apply the provisions of:

- Reduction Scheme; or
- Emission and Fugitive Limits SED Box 5

In addition to the above, the requirements of the emission limits and conditions for certain designated risk phrase materials (SED Box 6) must be met.

5.3 The Reduction Scheme is the preferred method of preventing and minimising emissions of VOC, using non-abatement techniques such as:

- water borne coatings and inks, (low organic solvent content)
- higher solids content coatings and inks
- *powder coatings and inks*
- organic solvent free liquid coatings and inks
- radiation cured coatings and inks (for example, ultra violet and electron beam)

SED Box 4 VOC compliance

(article 5) All Activities

All installations must comply with either:

(a) The emission limit in waste gases and the fugitive emission values in SED Box 5 and the emission limits for designated risk phrase materials in SED Box 6

Or

(b) The requirements of the Reduction Scheme (**5.5, 5.6, Table 6, 5.7, 5.9**) and the emission limits for designated risk phrase materials in SED Box 6

An operator can choose to transfer all or part of their activities designated for control under the SED prior to the compliance date.

5.4 The provisions described in this Section are achievable using best available techniques described in **Section 6**.

- The reference conditions for limits in **Section 5** are: 273.15K, 101.3kPa, without correction for water vapour content, unless stated otherwise.

Non VOC Emission Limits

Table 4: Non VOC emission limits, monitoring and other provisions

All processes/activities					
Row	**Substance**	**Source**	**Emission limits /provisions**	**Type of monitoring**	**Monitoring frequency**
1	Carbon monoxide	From oxidation plant	100 mg/Nm^3 as 15 minute mean for contained sources	**Catalytic oxidiser** Monitoring and recording. See paragraphs **5.21, 5.22** and **5.23**	Continuous
				Plus	Plus
				Manual extractive testing See paragraphs **5.23, 5.24, 5.25** *and* **5.26**	Annual
		From turbines, reciprocating engines or boilers used as VOC abatement equipment	500 mg/ Nm^3 at 5% oxygen dry gas, as 15 minute mean for contained sources	**All other types of abatement** Manual *extractive* testing See paragraphs **5.23, 5.24, 5.25** and **5.26**	Annual
2	Oxides of Nitrogen (measured as nitrogen dioxide)	From oxidation plant	100 mg/ Nm^3 as 15 *minute mean for* contained sources	Manual *extractive* testing see **5.23, 5.24, 5.25** and 5.26	Annual
		From turbines, reciprocating engines or boilers used as VOC abatement equipment	500 mg/ Nm^3 as 15 minute mean for contained courses		
3	Sulphur dioxide	All processes / activities	1% wt/wt sulphur in fuel	Certification by supplier using test method ASTM D86 distillation	Every delivery
		All processes / activities using gas oil as defined in the Sulphur Content of Certain Liquid Fuels Directive (1999/32/EC).	0.2% wt/wt sulphur in fuel (before 1/01/2008) 01% wt/wt sulphur in fuel (from 1/10/2008)		

VOC Emission Limits

Table 5: VOC emission limits, monitoring and other provisions

Row	VOC	Emission limits / provision	Type of monitoring	Monitoring frequency
1	**All processes / activities** Where solvents containing greater than 5% aromatic hydrocarbons by weight are used	VOC expressed as total carbon excluding particulate matter 100 mg/Nm^3 as 15 minute mean for contained sources	Abated releases monitoring and recording See paragraphs **5.21, 5.22** and **5.23**. Plus Annual manual extractive testing See paragraphs ***5.23, 5.24*** and ***5.26*** Non abated releases Annual manual extractive testing See paragraphs **5.23, 5.24, 5.25, 5.26** and **5.27**	Abated releases Continuous monitoring Plus Annual manual extractive Non abated releases Annual manual extractive
2	**All processes / activities** Except where solvents containing greater than 5% aromatic hydrocarbons by weight are used and the mass emission of VOC from an individual source is less than 1kg in any 8hour period	VOC expressed as total carbon excluding *particulate matter* 150 mg/Nm^3 as 15 minute mean for contained sources		
3	**Non-methane VOC** From turbines, reciprocating engines or boilers used as VOC abatement equipment	VOC expressed as total carbon excluding particulate matter 150 mg/Nm^3 as 15 minute mean for contained sources		

Reduction Scheme

Solvent Reduction Scheme

5.5 An operator may choose to use the Reduction Scheme for an installation to achieve emission reductions to a "**Target Emission**" equivalent to those, which would have been achieved if the concentration emission limits, had been applied.

The following scheme shall operate for installations for which a constant solid content of product can be assumed and used to define the reference point for emission reductions.

The operator shall forward an emission reduction plan, which includes in particular:

- decreases in the average solvent content of the total input; and/or
- increased efficiency in the use of solids

to achieve a reduction of the total emissions from the installation.

5.6 *The Target Emission for an installation is calculated as follows;*

(a) The Total Mass of Solids in the quantity of coating and/or ink consumed in a year is determined.
- solids are all materials in coatings and inks that become solid as a result of curing, polymerisation, or the evaporation of the water solvent
- all ingredients other than water and organic solvents should be assumed to form part of the solid coating

(b) **Table 6** Target Emission Values must then be used to determine the Target Emission.

Table 6: Target Emission Values

Installation		Target Emission all Existing installations at 1/12/98	Target Emission all Existing Installations by 31/10/2005 And Target Emission all New and Substantially changed installation until 31/10/2004	Target Emission all existing Installations from 31/10/2007 And Target Emission all New and Substantially changed installations from 31/10/2004
Coating Activity	Coating of food contact flexible packaging film or paper 15 tonnes or more solvent consumption	Total Mass of Solids x 1	Total Mass of Solids x 0.87	Total Mass of Solids x 0.58
	Coating of food contact flexible packaging film or paper 5 – 15 tonnes solvent consumption	Total Mass of Solids x 1		Total Mass of Solids x 0.93
	Coating of non food contact flexible packaging film or paper 5 tonnes or more and less than 15 tonnes solvent consumption	Total Mass of Solids x 1		
Printing Activity	Rotogravure, flexography, laminating or varnishing activities 5 tonnes or more solvent consumption	Total Mass of Solids x 1		

Compliance with Reduction Scheme

5.7 *Compliance with Reduction Scheme is achieved if the annual actual* solvent emission determined from the Solvent Management is less than or equal to the Target Emission.

- Where the annual actual solvent emission is:

  Annual actual solvent emission = I_1-O_8-O_7-O_6 (-O_5 if abatement has been used)

  (see Definitions below)
- Where a coating activity includes both food and non-food contact coating, compliance with the reduction scheme should be determined for each operation separately. Compliance is achieved if the annual actual solvent emission for both the food contact and the non-food contact coating is less than or equal to the sum of the individual target emissions for food contact and non-food contact coating.

Benchmarking for the selection of low organic solvent inks and coatings. Processes non SED activities

5.8 The benchmarking for the acceptability of low organic solvent inks and coatings for Non SED Activities is that they should achieve similar reductions to those, which would have been achieved if inks or coatings containing conventional organic solvents had been used with suitable abatement techniques. The following assumptions may be made when making this comparison:

- conventional organic solvent, inks and coatings contain 80% organic solvent by mass and 20% solids, i.e. organic solvent to solids ratio of 4:1.
- fugitive emissions not collected by abatement techniques are 25%.
- VOC retained within the printing substrate are negligible.
- emissions from cleaning organic solvents are small compared to organic solvent use in coatings and therefore need not be counted.

From these assumptions the organic solvent to solids ratio used in reformulated low organic solvent inks and coatings should be equivalent to:

4 x 0.25 i.e. 1:1

to give the same emission as would have been achieved if inks or coatings containing conventional organic solvents had been used with suitable abatement techniques.

5.9 The flexibility inherent in this compliance route should not be taken to encourage

- the replacement of a low or no organic solvent coating system with a conventional high organic solvent coating system, or
- the introduction of such a conventional high organic solvent coating system into a process/activity or
- the introduction of such a conventional high organic solvent coating system onto a product where it was not in use before, or
- the introduction of high solids formulations which have no beneficial effect on the product but increase the solids used, except where a reduction in the over-all VOC emissions can be demonstrated.

Regulators should seek prior notification of any proposal to introduce such systems, which should include reasons why lower organic solvent systems are not considered technically appropriate or practicable.

Determination of Solvent Consumption

5.10 *Construction of inventories of materials consumed and disposed of may* involve the identification of individual organic solvents, or solids. This may give rise to an issue of commercial confidentially. Information supplied must be placed on the pubic register, unless exclusion has been granted on the grounds of commercial confidentiality or national security. (Further guidance can be found in chapter 8 of the General Guidance Manual on policy and procedures for A2 and B installations)

5.11 A determination of the organic solvent consumption, the total mass of organic solvent Inputs minus any solvents sent for reuse/recovery off-site, should be made and submitted to the regulator annually, preferably to coincide with the operators stocktaking requirements, in the form of a mass balance in order to determine the annual actual consumption of organic solvent (C):

Where: $C=I_1-O_6$

I_1 Total quantity of organic solvents, or their quantity in preparations purchased which are used as input into the process/activity.

A calculation of the purchased organic solvent Input (I_1) to the process/activity, is carried out by recording:

(i) The mass of organic solvent contained in inks, coatings, diluents and cleaners in the initial stock (IS) at the start of the accounting period: *plus*
(ii) The mass of organic solvent contained in inks, coatings, diluents and cleaners in the purchased stock (PS) during the accounting period.
(iii) Minus the mass of organic solvent contained in inks, coatings, diluents and cleaners in the final stock (FS) at the end of the accounting period.

Total Organic Solvent Input (I_1)=IS+PS-FS

Solvent Management Plan

5.12 The Solvent Management Plan provides definitions and calculations to demonstrate compliance with the VOC requirements of this note. The use of the standard definitions and calculations also ensures consistency of VOC compliance across installations with an industrial sector.

5.13 The definitions provided must be used in all calculations relating to the Solvent Management Plan (SMP) (**Figure 5.1**).

- for SED installations using the emission and fugitive limits, the SMP should be used for determining the fugitive emissions (SED Box 9). *Once completed, it need not be done until the equipment is modified*
- for process/activities using the reduction scheme, the SMP should be used to determine the actual emissions annually (paragraph **5.7**)

Definitions:

The following definitions provide a framework for the mass balance calculations used in determining compliance.

Inputs of Organic Solvent in the time frame over which the mass balance is being calculated (I)

I_1 The quantity of organic solvents, or their quantity in preparations purchased which are used as input into the process/activity (including organic solvents used in the cleaning of equipment, but not those used for the cleaning of the products).

I_2 The quantity of organic solvents or their quantity in preparations recovered and reused as solvent input into the process/activity. (the recycled solvent is counted every time it is used to carry out the activity).

Outputs of Organic Solvents in the time frame over which the mass balance is being calculated (O)

O_1 Emissions in waste gases.

O_2 Organic solvents lost in water, if appropriate taking into account waste water treatment when calculating O_5.

O_3 Then quantity of organic solvents which remains as contamination or residue in products output from the process/activity.

O_4 Uncaptured emissions of organic solvents to air. This includes the general ventilation of rooms, where air is released to the outside environment via windows, doors, vents and similar openings.

O_5 Organic solvents and/or organic compounds lost due to chemical or physical reactions. (including for example those which are destroyed, e.g. by thermal oxidation or other waste gas or waste water treatments, or captured, e.g. by adsorption, as long as they are not counted under O_6, O_7, or O_8).

O_6 Organic solvents contained in collected waste.

O_7 Organic solvents, or organic solvents contained in preparations, which are sold or are intended to be sold as a commercially valuable product.

O_8 Organic solvents contained in preparations recovered for reuse but not as input into the process/activity, as long as not counted under O_7.

O_9 Organic solvents released in other ways.

SED Box 6 SED requirements for Designated Risk Phrase Materials

(articles 5, 7, 8, 9)

All activities using Designated Risk Phrase Materials

Designated Risk Phrase Materials used in SED installations must be either replaced, controlled and or limited, as set out below.

All SED Installations.

i.e. existing, new and substantially changed

Row	Designated Risk Phrase Materials with risk phrases R45, R46, R49, R60, R60	
1	*Requirements* • Replace as far as possible (taking into account guidance under article 7(1) of the SED. See **Appendix 2**) by less harmful substances or preparations	*Monitoring / timescales* • Existing installations must comply within the shortest possible time • New and substantially changed installations must comply from 1 April 2001
	• Control under contained conditions as far as technically and economically feasible to safe-guard public health and the environment. Normally, in accordance with the guidance provided within **Section 6** of the note	• Existing installations must comply by 31 October 2007 • New and substantially changed installations must comply from 1 April 2001
	• Limit-where the sum of the mass flows of all the discharges of all the compounds causing the risk phrase labelling is greater or equal to 10 g/h, a limit value of 2 mg/Nm^3 for the mass sum of the individual compounds must apply	Annual manual extractive testing See paragraphs **5.23, 5.24, 5.25, 5.26, 5.27** and SED Box 8 • Existing installations must comply by 31 October 2007 • New and substantially changed installations must comply from 1 April 2001
	Halogenated VOC with risk phrase R40	
2	Requirements • Control under contained conditions as far as technically and economically feasible to safe-guard public health and the environment. Normally, in accordance with *the guidance provided within* ***Section 6*** *of* the note	Monitoring / timescales • Existing installations must comply by 31 October 2007 • New and substantially changed installations *must comply from 1 April 2001*
	• Limit-where the sum of the mass flows of all the discharges of all the compounds causing the risk phrase labelling is greater or equal to 100 g/h, a limit value of 20 mg/Nm^3 for the mass sum of the individual compounds must apply	Annual manual extractive testing See paragraphs **5.23, 5.24, 5.25, 5.26, 5.27** and SED Box 8 • Existing installations must comply by 31 October 2007 • New and substantially changed installations must comply from 1 April 2001

N.B. Substances or preparations or halogenated VOC which have been assigned as designated risk phrase materials since 29 March 1999, or which are assigned as designated risk phrase materials in future must apply the replace, control and limit requirements, above within the shortest possible time from the date at which substances or preparations or halogenated VOC became/become designated risk phrase materials.

In determining the Shortest Possible Time, the operator will need to justify their timetables taking into account the following four factors contained within the SED:

- fitness for use;
- potential effects on human health;
- potential effects on the environment; and
- the economic consequences, in particular the costs and the benefits of the options available

For details of risk phrases see references i and j

Other Provisions

Monitoring, investigation and recording

5.14 The need for and scope of testing and the frequency and time of sampling depend on local circumstances, operational practice and the scale of operation. As part of proper supervision the operator will monitor emissions, make tests and inspections of the process/activity and keep records, in particular:

- The operator should keep records of inspections, tests and monitoring, including all non-continuous monitoring, inspections and visual assessments. In such cases:
  - current records should be kept on site and made available for the regulator to examine.
  - records should be kept by the operator for at least two years

5.15 The regulator needs to be informed of monitoring to be carried out and the results; the results should include process conditions at the time of monitoring.

- The process operator should provide a list of keep abatement plant and should have a written plan for dealing with its failure, in order to minimise any adverse effects.

- The operator should notify the regulator at least 7 days before any periodic monitoring exercise to determine compliance with emission limit values. The operator should state the provisional time and date of monitoring, pollutants to be tested and the methods to be used.

- The results of non-continuous emission testing should be forwarded to the regulator within 8 weeks of the completion of the sampling.

- Adverse results from **any** monitoring activity (both continuous and non-continuous) should be investigated by the operator as soon as the monitoring data has been obtained/received. The operator should:
  - identify the cause and take corrective action
  - record as much detail as possible regarding the cause and extent of the problem and the action taken by the operator to rectify the situation
  - re-test to demonstrate compliance as soon as possible; and
  - notify the regulator

Visible and odorous emissions

5.16 Visible and odours emissions should be limited and monitored as follows. Abnormal emissions require action as described in the "Abnormal events" paragraph below.

- Emissions from combustion processes should in normal operation be free from visible smoke and in any case should not exceed the equivalent of Ringelmann Shade 1 as described in British Standard BS 2742:1969.

- All releases to air, other than condensed water vapour, should be free from persistent visible emissions.

- All emissions to air should be free from droplets.

- There should be no offensive odour beyond the site boundary, as perceived by the regulator.

Abnormal events

5.17 The regulator needs to be notified about certain events, whether or not there is related monitoring showing an adverse result, and the operator should respond to problems which may have an adverse effect on emissions to air.

- In the case of abnormal emissions, malfunction or breakdown leading to abnormal emissions the operator must:

  - investigate immediately and undertake corrective action
  - adjust the process or activity to minimise those emissions; and
  - promptly record the events and actions taken

- the regulator must be informed without delay:

  - if there is an emission that is likely to have an effect on the local community
  - in the event of the failure of key abatement plant, for example, bio scrubber, thermal oxidiser units

SED Box 7 Non compliance causing immediate danger

(article 10) All Activities

In cases of non-compliance causing immediate danger to human health, operation of the activity must be suspended.

All of the following criteria should be taken into account:

- the toxicity of the substances being released
- the amount released
- the location of the installation; and
- the sensitivity of the receptors

Start up and Shut down

5.18 Higher emissions may occur during start-up and shut-down of a process. These emissions can be reduced by minimising, where possible, the number of start-ups and shut-downs and having adequate procedures in place for start-up and shut-down and emergency shut-downs.

- All appropriate precautions must be taken to minimise emissions during start-up and shut-down.

Efficient capture of emissions

5.19 Exhaust flow rates of waste gases must be consistent with efficient capture of emissions, good operating practice and meeting the requirements of the legislation relating to the workplace environment.

- The introduction of dilution air to achieve emission concentration limits must not be permitted.

- Dilution air may be added for waste gas cooling or improved dispersion where justified, but this must not be considered when determining the mass concentration of the pollutant in the waste gases.

Continuous indicative monitoring

5.20 Continuous indicative monitoring can be used as a management tool. In conjunction with continuous recording it identifies any trends in emissions; for example, that emissions are gradually increasing, which may indicate a need for maintenance. It can also be used with or without continuous recording to trigger an alarm when there is a sudden increase in emissions; for example, if abatement plants fails. For a given concentration of pollutant, the output level varies with the instrument. It should be noted that not all monitors provide a linear response to an increase in pollutant. The monitor should be set up to provide a baseline output when the plant is known to be operating under the best possible conditions; i.e. such that emissions are fully compliant with the requirements. The instrument manufacturer should e able to set an output level, which corresponds, to around 75% of the emission limit, to trigger alarms. Thus the alarms are activated in response to this significant increase in pollutant loading above the baseline, so that warning of the changed state is given before an unacceptable emission occurs.

Continuous monitoring VOC abated releases

5.21 Where continuous monitoring and recording is required to demonstrate compliance with the VOC requirements of the note. For existing VOC abatement equipment surrogate measurements for VOC are acceptable. Where new VOC abatement equipment is installed, or existing VOC abatement equipment is modified, or the operating conditions are

changed, VOC monitoring should be carried out once more to demonstrate that the surrogate measurements are adequate to ensure compliance.

- Thermal oxidisers must have continuous monitoring and recording for VOC expressed as total carbon excluding particulate matter. After sufficient monitoring data has been collected to clearly demonstrate adequate VOC destruction continuous monitoring of temperature may be used as a surrogate measurement.

- Catalytic oxidisers must have continuous monitoring and recording for VOC expressed as total carbon excluding particulate matter. After sufficient monitoring data has been collected to clearly demonstrate adequate VOC destruction continuous monitoring of carbon monoxide and temperature may be used as a surrogate measurement. (It may be possible to wave the requirement for carbon monoxide monitoring, if the operator can demonstrate to the regulator that the catalytic oxidiser is designed in such a way that it can not exceed the carbon monoxide limit (see Non VOC Emission Limits))

- Bio scrubbers and reactors must have continuous monitoring and recording for VOC expressed as total carbon excluding particulate matter. After sufficient monitoring data has been collected to clearly demonstrate adequate VOC destruction continuous monitoring of the flow and $_pH$ of the re-circulating water, fan suction. Exhaust temperature and pressure drop across the packing, coupled with daily monitoring of the nutrient may be used as a surrogate measurement.

- Turbines, reciprocating engines, boilers or any other form of VOC abatement equipment must have continuous monitoring and recording for VOC expressed as total carbon excluding particular matter.

5.22 Where continuous monitoring is required, it should be carried out as follows:

- All continuous monitoring readings should be on display to appropriately trained operating staff.

- Instruments should be fitted with audible and visual alarms, situated appropriately to warn the operator of abatement plant failure or malfunction.

- The activation of alarms should be automatically recorded.

- All continuous monitors should be operated, maintained and calibrated (or referenced) in accordance with the manufacturer's instructions. The relevant maintenance and calibration (or referencing) should be recorded, and such records made available for inspection by the regulator.

- All new continuous monitoring equipment should be designed for less than 5% downtime over any 3 month period.

Calibration and compliance monitoring

5.23 Calibration and compliance monitoring should meet the following requirements as appropriate.

No result should exceed the emission concentration limits specified, except where either:

(a) data is obtained over at least 5 sampling hours in increments of 15 minutes or less; or
(b) at least 20 results are obtained where sampling time increments of more than 15 minute are involved; AND in the case of (a) or (b)
(c) no daily mean of all 15 minute mean emission concentrations should exceed the specified emission concentration limits during normal operation (excluding start-up and shut-down); and
(d) no 15 minute mean emission concentration should exceed twice the specified emission concentration limits during normal operation (excluding start-up and shut-down).

SED Box 8 VOC Monitoring

(article 9)

All Activities Using

1) Emission and Fugitive Limits; or

2) Abatement with the Reduction Scheme

For periodic measurements of VOC at least three readings must be obtained during each measurement exercise.

VOC emission limit values shall be considered to be complied with if, in one monitoring exercise:

a) the average of all the readings does not exceed the emission limit values, and
b) none of the hourly averages exceeds the emission limit value by more than a factor of 1.5*.

Where continuous monitoring is carried out to demonstrate compliance with VOC emission limits:

a) none of the averages over 24 hours of normal operation exceeds the emission limit values, and
b) none of the hourly averages exceeds the emission limit values by more than a factor of 1.5*.

*the hourly average of the 15 minute means value may be used to demonstrate compliance

Calibration and compliance monitoring test methods

5.24 Calibration and compliance monitoring for all substances should be carried out using methods below or methods which can be demonstrated to be equivalent to those stated.

- Stationary source emissions – Determination of the mass concentration of total gaseous organic carbon in flue gases from organic solvent using processes – Continuous flame ionisation detector method. EN 13526.
- Stationary source emissions – Determination of mass concentration of individual gaseous organic compounds EN 13649.
- Emissions monitoring of nitrogen dioxide should be carried out in accordance with ISO 10849.
- Emissions monitoring of carbon monoxide should be carried out in accordance with ISO 12039.

Varying of monitoring frequency

5.25 Where non-continuous quantitative monitoring is required the frequency may be varied. Where there is consistent compliance with emission limits, regulators may consider reducing the frequency. When determining "consistent compliance" factors to consider include:

a) the variability of monitoring results, for example, results which range from 15 – 45 mg/Nm^3, against emission limit of 50 mg/Nm^3 might not qualify for a reduction in monitoring.
b) The margin between the results and the emission limit, for example, results which range from 45 – 50 mg/Nm^3 when the limit is 50 mg/Nm^3 might not qualify for a reduction in monitoring.

- Consistent compliance should be demonstrated using the results from at least;
  - three or more monitoring exercises within two years; or
  - two or more monitoring exercises in one year supported by continuous monitoring

- Any significant process changes, which might have affected the monitored emission, should be taken into account.

5.26 The frequency of testing should be increased, for example, as part of the commissioning of new or substantially changed activities, or where emission levels are near to or approach the emission concentration limits

Monitoring of unabated releases

5.27 Where emission limit values for VOC are consistently met without the use of abatement equipment, the monitoring requirement for those pollutants should be dispensed with subject to the "Varying of monitoring frequency" paragraphs above.

Sampling provisions

5.28 Care is needed in the design and location of sampling systems inorder to obtain representative samples.

- The operator should ensure that adequate facilities for sampling are provided on vents or ducts.

- Sampling points on new plant should be designed to comply with the British or equivalent standards.

SED Fugitive emissions

SED Box 9 Determining Fugitive Emissions

(Annex III)

Activities Not Using the Reduction Scheme

Determining fugitive emissions using the Solvent Management Plan

To demonstrate compliance with fugitive emission values in SED Box 5 the operator must determine the fugitive emissions (F) from the installations using the following:

$F=I_1 - O_1 - O_5 - O_6 - O_7 - O_8$

Or

$F=O_2+O_3+O_4+O_9$

This quantity can be determined by direct measurement of the quantities. Alternatively, an equivalent calculation can be made by other means, for instance by using the capture efficiency of the process.

The Fugitive Emission value as a percentage of the Solvent input (I) is determined by

Fugitive Emission Value + 100 x F/I

Where the Solvent Input (I)=1_1+I_2 (determined as part of the Solvent Management Plan)

Fugitive emission values must be determined for each installation, and must be repeated when any equipment modification is carried out.

Two or more SED activities within the same installation

SED Box 10 All Installations with Tow or More Activities

(Article 5 and Annex III)

Installations with two or more activities

Installations where two or more of the activities in Annex I of the Solvents Emisisons Directive are carried out, each of which exceeds the threshold in Annex IIA of the Solvents Emissions Directive must:

1) as regards to Designated Risk Phrase Materials, meet the requirements specified in SED Box 6, for each activity individually;

2) as regards all other substances, either:

   i. meet the requirements for each activity individually; or
   ii. have total emissions not exceeding those that would have resulted had point (i) been applied.

When applying 2 (ii) above, the Solvent Management Plan should be done to determine total emissions from all activities concerned. That figure must then be compared with the total emissions from the installations that would have resulted had the requirements of Annex II of the SED been met for each activity separately.

6 Control techniques

Summary of Best Available Techniques

6.1 The following table provides a summary of best available techniques that can be used to control the activity or installation in order to meet the emission limits and provisions in **Section 5**. Provided that it is demonstrated to the satisfaction of the regulator that an equivalent level of control will be achieved, then other techniques may be used.

Table 7: Summary of Control Techniques

Release source	Substance	Control techniques
Storage and handling of organic solvents and materials containing organic solvents	VOC	Use of low organic solvent inks / coatings materials
		Use of low volatility organic *solvent cleaning solutions*
		Use of enclosed mixing and storage vessels
		Sitting of storage tanks, Back venting deliveries if needed
		Capture, or capture and disposal or capture and destruction
Flue Gas	Sulphur oxides	Limit sulphur in fuel
	Nitrogen oxides	Low NOx burners
	Carbon monoxide	Good combustion
	VOC	*Efficient thermal oxidation*
UV lamps and Corona discharges	Ozone	Dispersion

Non VOC Releases Control Techniques

Sulphur dioxide

6.2 In combustion processes the most significant release of sulphur dioxide occurs as a result of the sulphur content of the fuel burnt and should be addressed by using low sulphur fuel as specified in **Table 4**.

Nitrogen oxides

6.3 In combustion processes nitrogen oxides can be formed as a result of the combustion of nitrogen in the fuel or the formation of thermal nitrogen oxides from nitrogen in the air used for combustion.

- Where necessary, the nitrogen content of the fuel and other material being burnt should be controlled.
- Where necessary, Low NOx burners should be installed.

Ozone

6.4 Where ozone is emitted from equipment and is currently only vented to the external atmosphere it should in future be ducted to stacks to ensure adequate dispersion.

- This is in relation to significant releases i.e. uv and corona discharges. Emissions of ozone should be dispersed in accordance in the provisions of paragraph **6.14**.

VOC Control Techniques

VOC and odour control storage

6.5 Odour may arise from the receipt, handling and storage or organic solvents and organic solvent containing liquids. Careful sighting and storage and mixing tanks, particularly in relation to new and replacement tanks and controlled handling of odorous liquids may help prevent offensive emissions off-site. In addition:

- Bulk storage tanks for organic solvents and organic solvent-containing liquids should wherever practicable be back vented to the delivery tank during filling. Where this is impracticable, displaced air vents should be sited in such as way as to prevent the arising of offensive odour beyond the site boundary.

- All potentially odorous waste materials should be stored in suitable closed containers or bulk storage vessels, where appropriate vented to suitable abatement plant.

6.6 Breathing losses from bulk storage tanks can be minimised by fitting pressure vacuum relief valves. The vapour pressure within the bulk storage can also be minimised by reducing the solar absorbency of the storage tank.

- The exterior of bulk storage tanks for organic solvent storage should normally be light coloured.

- If necessary, emissions from fixed organic solvent storage tanks should be vented to suitable arrestment equipment to meet the emission limits in **Section 5**.

- All new static bulk organic solvent storage tanks containing organic solvent with a composite vapour pressure that is likely to exceed 0.4kPa at 20°c (293K) should be fitted with pressure vacuum relief valves. Pressure vacuum relief valves should be examined at regular intervals for signs of contamination, incorrect seating and be cleaned and/or corrected as required. The normal minimum examination frequency should be once every six months, but less frequent examination may be justified having regard for the tank contents and the potential emissions as a result of valve failure.

6.7 Both major and minor spillage of organic solvent from bulk storage tanks can arise as a result of a number of scenarios such as: overfilling of tanks, incorrect draining of filling lines, operator error or vandalism.

- Delivery connections to bulk storage tanks should be located within a bunded area.

- Where the operator can not demonstrate to the satisfaction of the regulation that suitable management controls and training with regard to bulk storage deliveries of organic solvents and organic solvent containing materials are in place, along with adequate on-site security, then connections to bulk storage tanks should be fixed and locked when not in use.

- All fixed storage tanks should be fitted with high-level alarms or volume indicators to warn of overfilling. Where practicable the filling systems should be interlocked to the alarm system to prevent overfilling.

- Bunding should

  - completely surround the bulk liquid storage tanks
  - be impervious and resistant to the liquids in storage; and
  - be capable of holding 110% of the capacity of the largest storage tank.

VOC control handling

6.8 The receipt, handling, use and storage of organic solvents and organic solvent containing liquids will give rise to fugitive releases of VOC.

- Inks/coatings containing VOC should be stored in closed storage containers.

- All measures should be taken to minimise VOC emissions during mixing, i.e. the use of covered or closed mixing vessels.

- Emissions from the emptying of mixing vessels and transfer of materials should be adequately contained, preferably by the use of closed transfer systems. This may be achieved by the use of closed mobile containers, containers with close-fitting lids, or preferably, closed containers with pipeline delivery.

VOC control cleaning

6.9 Cleaning operations will give rise to fugitive releases of VOC.

- Cleaning operations involving organic solvents should be periodically reviewed, normally at least once every two years, to identify opportunities for reducing VOC emissions (e.g. cleaning steps that can be eliminated or alternative cleaning methods). The regulator should be provided with a report on the conclusions of the review.

- Application of cleaning solvents should be:

  - from a contained device or automatic system when applied directly on to machine rollers; and

- dispensed by piston type dispenser or similar contained device, when used on wipes.

➢ When organic solvent is used of wipes:

- pre-impregnated wipes should be held within an enclosed container prior to use
- where practicable no organic solvent cleaning fluids or significantly less volatile organic solvents cleaning fluids should be used (with or without the addition of mechanical, chemical or thermal enhancements).

➢ Where practicable, fixed equipment should be cleaned in-situ, and such equipment should, where practicable, be kept enclosed whilst cleaning is carried out.

➢ Where equipment is cleaned off-line (such as screens, plates, drums, rollers and coating/ink trays) cleaning should be carried out using enclosed cleaning systems, wherever possible. Enclosed cleaning systems should be sealed to prevent emissions whilst in operation, except during purging at the end of the cleaning cycle. If this is not practicable emissions should be contained and vented to abetment plant where necessary.

➢ Residual ink/coating contained in parts of the application equipment should be removed prior to cleaning.

VOC control operational

6.10 Organic solvent losses can be identified and minimise by operational controls and good operational practice.

➢ Programmable scales should be used during the mixing and preparation of inks/coatings to reduce organic solvent usage.

➢ A programme to monitor and record the consumption of inks / coatings / organic solvent against product produced should be used to minimise the amount of excess organic solvent / coating / ink used.

VOC control waste

6.11 Waste contaminated with VOC may give rise to both odorous and fugitive emissions.

➢ All reasonably practicable efforts should be made to minimise the amount of residual organic solvent bearing material left in drums and other containers after use. All organic solvent contaminated waste should be stored in closed containers.

- Prior to disposal, empty drums and containers contaminated with organic solvent should be closed to minimise emissions from residues during storage prior to disposal and labelled, so that all the handle them are aware of their contents and hazardous properties.

- Nominally empty drums or drums containing waste contaminated with VOC awaiting disposal should be stored in accordance with the requirements of full or new containers.

- Prior to disposal used wipes and other items contaminated with organic solvent should be placed in a suitably labelled metal bin fitted with a self-closing lid.

  Note: from a health and safety point of view it is advised that bins should be emptied at least daily, as they not only present a fire hazard, they may also undergo spontaneous combustion.

  - For materials that may undergo spontaneous combustion special bins that allow air to circulate beneath and around them to aid cooling are advised or other bins specifically designed for this purpose.

General Control Techniques

Dust and spillage control

6.12 Adequate provision to contain liquid and solid spillage is needed. Closed containers can prevent wind whipping of dusty, dry waste materials such as materials collected during combustion chamber cleaning or arising from particulate abatement plant:

- dusty wastes should be stored in closed containers and handled in a manner that avoids emissions
- dry sweeping of dusty materials should not normally be permitted unless there are environmental or health and safety risks in using alternative techniques
- suitable organic solvent containment and spillage equipment should be readily available in all organic solvent handling areas
- a high standard of housekeeping should be maintained.

Air Quality

Ambient air quality management

6.13 In areas where air quality standards or objectives are being breached or are in serious risk of breach and it is clear from the detailed review and assessment work under Local Air Quality Management that the Part B process itself is a significant contributor to the problem, it may be necessary to impose tighter emission limits. If the air quality standard that is in danger of being exceeded is not an EC Directive requirement,

then industry is not expected to go beyond BAT to meet it. Decisions should be taken in the context of a local authority's Local Air Quality Management action plan. For example, where a Part B process is only responsible to a very small extent for an air quality problem, the authority should not unduly penalise the operator of the process by requiring disproportionate emissions reductions. More guidance on this is provided in paragraph 360 of the Air Quality Strategy which gives the following advice:

"*The approach from local authorities to tackling air quality should be an integrated one, involving all strands of local authority activity which impact on air quality and underpinned by a series of principles in which local authorities should aim to secure improvements in the most cost-effective manner, with regard to local environmental needs while avoiding unnecessary regulation. Their approach should seek an appropriate balance between controls on emissions from domestic, industrial and transport sources and draw on a combination and interaction of public, private and voluntary effort*".

Revised stack height calculations should not be required unless it is considered necessary because of a breach of serious risk of breach of an EC Directive limit value and because it is clear from the detailed review and assessment work that the Part B process itself is a significant contributor to the problem.

Dispersion and dilution from stack

6.14 Pollutants that are emitted via a stack require sufficient dispersion and dilution in the atmosphere to ensure that they ground at concentrations that are harmless. This is the basis upon which stack heights are calculated using HMIP Technical Guidance Note D1 (D1). The emission limit in this PG note should e used as the basis for chimney height calculation. The stack height so obtained is adjusted to take into account local meteorological data, local topography, nearby emissions and the influence of plant structure. It is necessary that the assessment also take into account the relevant air quality standards that apply for the emitted pollutants.

The calculation procedure of D1 is usually used to calculate the required stack height but alternative dispersion models may be used in agreement with the regulator. D1 relies upon the unimpeded vertical emission of the pollutant. A cap or other restriction over the stack impedes the vertical emission and hinders dispersion. For this reason where dispersion is required such flow impeders should not be used. A cone may sometimes be useful to increase the efflux velocity and achieve greater dispersion.

An operator may choose to meet tighter emission limits in order to reduce the required stack height

Stacks, vents and process exhausts

6.15 Liquid condensation on internal surfaces of stack flues and exhaust ducts might lead to corrosion and duct work failure or to droplet emission.

- Adequate insulation should be provided to minimise the cooling of waste gases and prevent liquid condensation by keeping the temperature of the exhaust gases above the dewpoint.

6.16 Unacceptable emissions of droplets could possibly occur from we abatement plant where the linear velocity within the associated duckwork exceeds 9 m/s. The use of mist eliminators reduced the potential for droplet emissions.

- Where a linear velocity of 9 m/s is exceeded in the ductwork of existing wet abatement plant, the linear velocity should be reduced, subject to health and safety considerations, to ensure that droplet fallout does not occur.

- The operator should maintain a statement of training requirements for each operational post and keep a record of the training received by each person whose actions may have an impact on the environment. These documents should be made available to the regulator on request.

6.17 The dispersion from all stacks and vents can be impaired by low exit velocity at the point of discharge, or deflection of the discharge.

- Stacks and ductwork should be cleaned to prevent accumulation of materials, as part of the routine maintenance programme.

- A minimum discharge velocity should be required in order to prevent the discharged plume being affected by aerodynamic down wash.

- Stacks or vents should not be fitted with any restriction at the final opening such as a plate, cap or cowl, with the exception of a cone which may be necessary to increase the exit velocity of the emissions.

Management

Management techniques

6.18 Important elements for effective control of emissions include:

- proper management, supervision and training for process operations;
- proper use of equipment;
- effective preventative maintenance on all plant and equipment concerned with the control of emissions to the air; and

- it is good practice to ensure that spares and consumables are available at short notice in order to rectify breakdowns rapidly. This is important with respect to abatement plant and other necessary environmental controls. It is useful to have an audited list of essential items.

➢ Spares and consumables – in particular, those subject to continual wear – should be held on site, or should be available at short notice from guaranteed suppliers, so that plant break-downs can be rectified rapidly.

Appropriate management systems

6.19 Effective management is central to environmental performance; it is an important component of BAT and of achieving compliance with permit conditions. It requires a commitment to establishing objectives, setting targets, measuring progress and revising the objectives according to results. This includes managing risks under normal operating conditions and in accidents and emergencies. It is therefore desirable that processes put in place some form of structured environmental management system (EMS), whether by adopting published standards (ISO 14001 or the EU Eco Management and Audit System (EMAS) or by setting up an EMS tailored to the nature and size of the particular process. Operators may also find that an EMS will help identify business savings.

Regulators should use their discretion, in consultation with individual operators, in agreeing the appropriate level of environmental management. Simple systems which ensure that LAPC considerations are taken account of in the day-to-day running of a process may well suffice, especially for small and medium-sized enterprises. While authorities may wish to encourage wider adoption of EMS, it is outside the legal scope of an LAPC authorisation/LAPPC permit to require an EMS for purposes other than LAPC/:APPC compliance. For further information / advice on EMS refer to EMS Additional Information in **Section 8**.

6.20 Staff at all levels need the necessary training and instruction in their duties relating to control of the process / activity and emissions to air. In order to minimise risk of emissions, particular emphasis should be given to control procedures during start up, shut down and abnormal conditions. Training may often sensibly be addressed in the EMS referred to in paragraph above.

➢ Training of all staff with responsibility for operating the process/activity should include:

- awareness of their responsibilities under the authorisation / Permit; in particular how to deal with conditions likely to give rise to VOC emissions, such as in the event of spillage
- minimising emissions on start up and shut down

- action to minimise emission during abnormal conditions.

6.21 Effective preventative maintenance should be employed on all aspects of the process / activity including all plant, buildings and the equipment concerned with the control of emissions to air. In particular:

- A written maintenance programme should be available to the regulator with respect to pollution control equipment; and
- A record of such maintenance should be made available for inspection by the regulator.

End of Permit