

Entec guidance notes

*What is
integrated
pollution
prevention &
control?*



The system of Pollution Prevention and Control (PPC) applies an integrated environmental approach to the regulation of certain industrial activities. This involves determining the appropriate controls for industry to protect the environment through a single permitting process. PPC also takes the integrated approach beyond the initial task of permitting and operating, through to the restoration of sites when industrial activities cease.

To gain a permit from the relevant licensing authority, operators will have to show that they have systematically developed proposals to apply the “best available techniques” (BAT) and meet certain other requirements, taking into account any relevant local conditions.

These are designed to balance the costs to the operator against the benefits to the environment. PPC aims to control the environmental impact of installations, prevent emissions and waste production and where that is not possible or practical, reduce them to acceptable levels.

In the UK, PPC operates under the Pollution Prevention and Control (England and Wales) Regulations. These Regulations have been made under the Pollution Prevention and Control (PPC) Act 1999, which implemented the EC Directive 96/61 on IPPC. Separate systems have also been introduced to apply the IPPC Directive to Scotland, Northern Ireland and the offshore oil and gas industries. The Directive required member states to implement local regulations so that all the required processes are permitted by 2007.

Prior to the PPC regulations coming into force, many industrial sectors covered by the IPPC Directive were regulated under Part I of the EPA 1990. This introduced the systems of Integrated Pollution Control (IPC), which controlled releases to all environmental media, and Local Authority Air Pollution Control (LAAPC), which controlled releases to air only.

The PPC Regulations create a new framework to prevent and control pollution, with systems similar to the old regimes of IPC and LAAPC, although local authorities now regulate integrated pollution control on some sites. There are also some further requirements that apply solely to waste management activities under PPC.



What are the differences between PPC and IPC?

Whilst the spirit of the PPC regulations is comparable to those of IPC, they are more onerous because the parameters on which process justification is based are more extensive, incorporating 'macro environment' considerations and the overall lifecycle of the scheme from construction to decommissioning.

The essence of PPC is that operators of processes should choose the best option available to achieve a high level of protection for the environment taken as a whole.

Other differences include:

- The whole installation is covered rather than just the process, as was the case under IPC;
- A greater range of substances are defined as pollutants for the first time;
- A range of other effects beyond emissions to land, air and water must be considered;
- Noise and vibration are defined as pollutants;
- Discharges to sewer are affected by PPC, thus "hard" COD or potentially harmful breakdown products may give rise to problems;
- Site condition reports are now mandatory for part 'A' Installations;
- Site closure and clean up plans are now part of the permit requirements;
- There is an emphasis on management systems to 'self-regulate' the activities;
- There are links into Health and Safety;
- A number of companies within sectors such as food and drink and waste are covered for the first time;
- BAT is required to incorporate the best techniques known from a European perspective, not just the UK level.



Integrated pollution prevention & control (IPPC)

The entire regulatory process for PPC consists of a number of elements. PPC applies to specified 'installations' - both 'existing' and 'new' - requiring each 'operator' to obtain a permit from the regulator - either the Environment Agency, Scottish Environment Protection Agency or the local authority.

The permitting process



Stage 1 - Permitting

The procedure begins with the preparation of an application by the operator. Once the regulator receives the application, they will consult with various statutory and other consultees. The regulator will then determine the application, either granting a permit with conditions or refusing it.

In making an application the operator must address how they propose to manage various environmental issues to the satisfaction of the regulator. These include:

- satisfactory environmental management of the installation;
- proposals for adequate monitoring of releases;
- assessment of polluting releases and the identification of Best Available Techniques (BAT);
- compliance with environmental quality standards (EQSs), other EU Directives and domestic regulations;
- energy efficiency;
- minimisation and management of raw materials and wastes; and
- the prevention of accidents.

The operator must also report on the condition of the site at the time of the original application. This will provide a basis for assessing the need for restoration when the installation closes (stage 3).

In determining the application, the regulator must be satisfied that the operator has addressed the above points appropriately. It is therefore the operator's responsibility to demonstrate that this is the case.

Stage 2 - Operation

Once the regulator has issued a permit, the operator of a PPC installation will have to carry out monitoring and reporting to demonstrate compliance with the permit conditions. Regulators may also carry out their own monitoring and inspections, and have a range of enforcement powers.

Over time, regulators may vary permits to reflect changes in how installations are operated, or for other reasons. The regulator may vary permit conditions at either its own or the operator's instigation, with the possibility of consultation in either case. The regulator may also transfer permits from one operator to another, for example when one operator is taken over by another. More generally, regulators must review permits periodically, or whenever circumstances make a review necessary, such as when significant pollution occurs.

Stage 3 - Closure

When an installation closes, an operator should apply to surrender the permit. The application to surrender the permit must include a site report identifying any changes in the condition of the site compared with the site report produced as part of the initial application for the permit. The operator is required to identify any steps that have been taken to avoid any pollution risk resulting from the operation of the installation or return it to a satisfactory state. Once the operator has satisfied the regulator that they have removed any pollution risks and restored the site to a satisfactory state the regulator will accept the surrender of the PPC permit.



Requirements of a valid PPC application

There are a number of discrete activities that need to be performed that are then brought together either through the completion of appropriate sections of the new application template software, or in the form of documents and reports to support the application. These activities are described below.

1) Introduction

A non-technical summary of the proposals is required to assist both the regulator and consultees in their understanding of the application.

2) Site plans and maps

To enhance the clarity of the application and show the 'installation' in its local setting. This section can also be used to provide plans and maps to reinforce and explain matters raised in other sections of the application.

3) Management techniques

Experience with IPC has shown that having a robust environmental management system (EMS) can result in minimisation of releases to the environment due to procedure controls. Under PPC, the Regulatory Agencies strongly encourage the operation of an EMS, preferably certified to one of the recognised standards (ISO 14001, EMAS). An EMS would usually be expected to be implemented within 3 years of the permit being issued if not in place during the application process.

4) Materials input

Information on raw material and water usage (process mapping) and efficiency of the use of raw materials is required for part 'A' applications. The study should identify an action plan to improve the use of raw materials and the minimisation of waste streams (both liquid and solid). Cost benefit analyses may be required to justify the levels of improvement and to retain certain practices.

5) Main activities: Description of installation

Descriptions are required of the plant and processes which make up the 'installation' so that the regulator can understand the activities and form a judgement about BAT arguments and whether improvements are required. Block, flow and process and instrumentation diagrams are required in this section, along with details of process and managerial controls, emergency procedures, and so on. Mass and energy balances should also be supplied which will also support other sections in the report. Considerable judgement of content is required here, to ensure that enough relevant information is given but without making the report too detailed and unreadable. Either extreme can cause delays in the application and permitting process and possible costly re-writing.

6) Main activities: In Process Controls

The installation will contain hardware (equipment) and software techniques (procedures) that operate the process and control releases to the environment. These techniques will need to be compared to BAT (as defined by the regulators technical guidance note) and will require specific justification if BAT is not operated at a site. There could be site specific reasons as to why BAT is not applied which will need demonstrating relative to the alternatives. Deviations from BAT can be expensive to justify as the regulator will normally require additional evaluation of the options against environmental impacts (e.g. dispersion modelling for releases to air etc).



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7) Abatement and control of emissions

The application must contain information about the processes, equipment, operating methods and maintenance to demonstrate that emissions are prevented or minimised. This will lead on from the process descriptions to demonstrate that pollutants are primarily captured by the abatement equipment and those that are released create minimal environmental impact. This is further confirmed by formal impact assessment later in the application. This section must cover all process and fugitive releases from the process, to air, land and water. Sector Guidance lists indicative emissions and 'BAT'. Deviations from these will need to be justified.

8) Control of emissions to ground water

The Groundwater Regulations 1998 are also to be considered for the installation under PPC. A risk assessment is required for the direct or indirect release of List I or II substances to ground waters. If the substances could be present as a consequence of the installation then the site has to investigate and monitor for the substances.

9) Waste handling, recovery and disposal

A plan is needed for the characterisation and disposal of waste arising from part 'A' Installations. This should include for its handling and any recovery processes that are used to minimise the amount and impacts of waste which eventually is sent for disposal.

10) Energy

The energy profiles (use and generation) of the site have to be defined for the fuels used on the site. Energy efficiency measures need to be appraised and a forward implementation programme defined, based on Guidance Note H2. Applications for part 'A' installations must demonstrate the efficient use of energy under the PPC regime as reductions from the Climate Change Levy are applicable to sites containing PPC part 'A' installations.

11) Accidents and their consequences

The PPC application will need to contain an assessment of the risks from accidental releases to the environment, their causes, pathways and potential impacts, using a recognised methodology approved by the regulator.



12) Noise and vibration

Under PPC noise and vibration are defined as pollutants. Consequently an impact assessment is likely to be required for these pollutants that demonstrates that Best Available Techniques (BAT) is applied for their abatement.

To demonstrate that BAT applies then a noise / vibration survey is required (if sufficient local data is not readily available), based on Guidance Note H3. The survey will be used in a cost benefit analysis to show areas of potential improvement and an improvement timetable is expected from the survey / analysis of the data.

13) Monitoring

These plans are required to cover the monitoring of all significant emissions. Monitoring should be in accordance with MCERTS where available, and justification will be needed for any departure from this standard. PPC Guidance suggests a hierarchy for sampling and analysis methods with CEN and BSI at the top. Many monitoring companies often use USEPA methods, which the EA have ranked as only fourth on the list.



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14) De-commissioning

A plan is required to ensure that the installation is decommissioned without pollution risk and the site is returned to a satisfactory state once the permitted operations have finally ended. This plan must be kept updated and there may be a need for a further assessment of land contamination (site condition report) at site closure to demonstrate that deterioration has not occurred.

The Site Condition Report is an important document. For part 'A' applications, a site condition report is required following the methodology and scope specified in Technical Guidance. This methodology follows a phased approach covering the following basic activities:

Phase 1a Assessment:

A desktop research and site reconnaissance study that develops a risk based conceptual model defining environmental risks from the condition of the site as regards ground contamination.

Site Protection and Monitoring Programme:

The Phase 1a assessment and model are used to define part of a post permit 'Site Protection and Monitoring Programme' (SPMP) through assessing the nature of contamination and risks associated with the land.

A draft SPMP will normally be required within 2 months of the permit issue.

15) Installation wide issues

This section is relevant where activities in the installation are controlled by more than one operator, for example where a utility company own/operate a water plant or effluent treatment works. There is a requirement to investigate if joint or co-operative actions may produce a net environmental gain, even if this is to the detriment of one operator, or if there are environmental risks associated with joint operation, which must be evaluated.

16) Emission benchmarks

Emission benchmarks are derived from various non-mandatory standards, EC derived environmental quality standards and other obligations from treaties, EC directives, national regulations and local quality standards. Many restrictions apply to specific releases or receiving media. The PPC application must address each of these, where relevant to the activity, and the permit enforce any requirements.

17) Environmental impact assessments

A key element of a PPC application is the assessment of the impact upon the environment for releases of significance to air, land and water. The releases will need to be considered in terms of impacts (via suitable dispersion and impact models) following Guidance Note H1, making use of the H1 software tool. Impacts will need to be considered in accordance with local environmental conditions (nearest receptors, SSSI locations etc.) and environmental quality standards and objectives.

The regulator places great emphasis on any emissions that could impact on local and national objectives, e.g. local air quality plans and objectives that are enforced by local authorities.

18) Consideration of waste management licensing regulations

For installations which currently dispose or recover waste, the specific requirements of the 1994 Waste Management Licensing Regulations must be considered. Many of the issues are covered in other parts of the application and cross-referencing to these sections, with brief commentary, may be sufficient.

19) Conservation (Natural Habitats) Regulations 1994

All PPC applications have to be considered against these regulations to assess if there is likely to be an impact on 'European Sites' within a prescribed distance of the installation. The applicant has to use BAT and impact assessments to demonstrate compliance with these regulations, given the impact from the installation and other plans and projects.

20) Improvement programme

Improvement plans and programmes should be proposed by the applicant where deviations from BAT are recognised, and a change can be identified and implemented to materially improve performance, reduce impact, etc. Time-scales for carrying out improvements will vary depending upon the complexity and relevance of the change to be made.

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