

Scenting change in odour control

Steve Fraser, principal consultant at RPS, discusses odour control and PPC.

The timetable for implementation roles inexorably onwards. For processes already regulated under part one of the Environmental Protection Act 1990, the Pollution Prevention and Control (PPC) Regulations will significantly increase the burden of regulation. The UK Environment Agencies (UKEAs) have published draft PPC guidance on odour (H4) which proposes odour benchmark standards based on olfactometry. This will increase the level of assessment required for offensive trades and other 'bad neighbour' processes. Most of these processes are already experienced in odour treatment and dealing with truculent regulators. For some sectors new to this sort of regime, such as food and drink manufacturing, adjusting to life under PPC could come as a bit of a shock.

Part one authorisations usu-

breweries and bakeries would need to achieve a lesser standard of 6 OU/m³.

The method for determining odour impact is necessarily convoluted. It is not possible to measure complex organic odours at the concentrations normally found in the environment. Operators therefore need to quantify the source emissions as best they can and use a suitable dispersion model to predict the odour footprint. The change away from subjective boundary fence standards towards quantitative techniques may have major implications for processes currently operating under a part one authorisation.

Structured process

PPC is very much about going through a structured rational process to justify the level of detail contained in the applica-

rate, efflux velocity, temperature, moisture etc. Mark it up on a detailed drawing. Include the results of any previous emission tests conducted.

In practice most odour is from point sources, so even in the case of a big site with multiple sources, it should be possible to prioritise emission sources for further investigation. It is important to keep an open mind, the relative contribution from multiple sources at receptors off-site will depend on odour concentration, volume, emission height, temperature, efflux velocity and entrainment. Stage one should also identify the appropriate methods of odour quantification, such as when to use odour units and when to use chemical species. Where possible the methods should be agreed with regulators beforehand.

At this point it may be a good idea to get some advice from experienced consultants. The advice you get will depend on whom you ask. Environmental consultants can quantify the sources, predict the odour footprint, help identify the main sources and the priorities for further investigation and abatement, but may be less knowledgeable about abatement systems or alternative means of production.

End-of-pipe solutions

Consulting engineers can help with technology reviews for end-of-pipe solutions, or consider process changes, provided you already know where the problems lie and know what emission limits need to be achieved. It's a bad idea to start talking to equipment providers unless you know exactly what part of the process needs abatement and can specify the appropriate performance requirements. Odour assessment is multi-disciplinary, it is not just knowing what the question is, it is also knowing who to ask, and at what stage.

Stage two involves measuring odour concentration, flow rates and other parameters to enable quantification. It is important not to skimp on this stage as the data will form the basis for decisions on subsequent abatement. Sampling and analysis should be in accordance with accredited procedures. Emissions from wastewater treatment can be estimated using partly validat-

ed emission estimates.

There are large uncertainties in measuring other fugitive emissions and it is generally advisable to contain emissions or explore ways of improving housekeeping before directing resources to measurement. If fugitive emissions are the main source of odour then it is likely that the process will be controlled through a residual "no offensive odour at boundary" style condition.

Dispersion model

Stage three of the assessment involves using a dispersion model to predict the odour concentration at receptors, taking account of the strength and volume of odour as well as height, temperature, building effect etc. In the case of multiple source emissions the model should provide a clear indication of the relative significance of different sources at receptors. This tells the operator how the process compares to the benchmark, what processes are the culprits and what level of abatement is likely to be needed.

So what if you don't meet the benchmarks? The first thing to consider is whether things can be arranged differently. Money spent on odour control may be necessary for compliance, but it is straight off the bottom line. The holy grail is to reduce odour by process modifications that improve productivity. The cost of abatement can drive change and payback economics. In the end odour control is going to cost you money. Just make sure you spend it in the right place. Where an end-of-stack solution is required, it's important to make sure it's treating the right bit of your plant, that the performance requirements are clearly specified and that the kit is capable of meeting the required standard.

For the UKEAs, PPC is also a major challenge. It will be interesting to observe how effective the new approach to odour control will be, particularly how the large uncertainties in sampling, analysis and dispersion modelling will be taken into account when determining BAT. The benchmarks in H4 are still draft and many operators are likely to delay investment decisions until the guidance is confirmed.

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ally relied on a condition requiring "no offensive odour at or beyond the boundary fence as perceived by the authorised inspector". One of the main difficulties in assessing odour in the past has been how far operators would need to go to assuage public concern and what level of odour control was needed to satisfy Best Available Technology Not Entailing Excessive Costs (BATNEEC).

Odour benchmarks

H4, as currently drafted, requires that odour emissions do not cause "reasonable grounds for annoyance" and proposes the use of odour benchmarks when assessing Best Available Techniques (BAT). The odour benchmark ranges from an hourly average odour concentration of 1.5-6 odour units (OU)/m³, to be achieved 98 per cent per year, at receptors not the site boundary. For processes traditionally perceived as being offensive such as landfill, wastewater treatment works and animal rendering, the benchmark would be 1.5 OU/m³, whereas

tion. The aim should be to conduct a sufficiently detailed assessment in accordance with UKEA guidance. For some processes, a preliminary risk assessment will be all that is required, with questions such as, Is this a smelly process? Does anybody live nearby? Is there a record of complaint?

Where a more detailed assessment is required then a three-stage approach is usually appropriate. This structured approach will help with plant investment decisions as well as provide some insurance against rising public expectations in the future. The first step is to compile an emissions inventory. This should include point sources such as stacks, ducts, and exhausts, area sources such as open tanks and fugitive emissions from buildings, tanks and vessels. This can be a daunting task to start with, so it is advisable to consider emissions by process areas to make the task more manageable.

Before conducting any tests it is advisable to obtain as much data from existing sources: location, height, flow

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