

UK Comments

Part 2 - Establishing Levels of Destruction or Irreversible Transformation

Background

1. Three generic approaches to this issue have been discussed by members of the Open-ended Working Group:
 - A. Direct monitoring of destruction efficiency;
 - B. Setting limits on emissions/releases to the environment; and
 - C. Requiring that technologies should be operated in accordance with Best Available Techniques (BAT).

A tabulation of these generic approaches and their main variations, along with the pros, cons and examples of regulatory approaches for each, is presented in Table 1.

2. Prior to OEWG-3, the considerable practical difficulties with establishing a direct measure of destruction efficiency had led to a proposal for combining the latter two approaches of establishing absolute levels on emissions and BAT. Issue Paper 2 prepared by Canada recommended:

'Recognizing that the destruction efficiency is a function of the POPs content, absolute levels could be established for each media based on feasible destruction efficiency at a particular input waste concentration. In establishing these absolute levels, consideration for the "best available technique (BAT)" is recommended'.

3. At OEWG-3, initial discussions were confused by different interpretations of the concept of 'absolute levels' (with one written submission defining this as a ratio similar to a destruction efficiency).
4. An informal group (of which the UK was a member) then met outside of the main contact group to try to find a way forward. This was the origin of a proposal to require:
 - (i) The use of technologies capable of 99.9999% destruction efficiency (DE) when they are operating with high (%) POPs waste, AND
 - (ii) Meeting agreed output concentrations in all media, AND
 - (iii) Processes should be operated in accordance with BAT.

5. The full contact group discussed the potential difficulties with this approach. Several modifications were necessary before the end of OEWG-3:
 - a. Point (i) was made more specific, referring to wastes above 1% POPs content, and specifically excluding technologies 'disposing of waste arising from the remediation of contaminated sites'.
 - b. Point (ii) was made more specific by indicating tentative concentrations in solid waste (to be discussed further), of [1-10 mg/kg] for PCBs and [5 mg/kg] for HCB and the eight pesticides; and referring to 'pertinent national legislation and international rules and standards' for emissions to air and water.
 - c. A caveat was entered that 'regarding PCDD/PCDF, a different approach ... might be necessary'.
6. The US has since submitted written comments on the proposal:
 - a. They propose amendment of the wording of the first point to read 'The technologies applied and waste treatment units used for treating POPs wastes should be capable of achieving a DE of 99.9999%,...';
 - b. They argue strongly for the use of DRE rather than DE (see Table 1);
 - c. They express reservations about the stipulation of a 99.9999% level.

Commentary

7. The UK has considerable reservations about the current proposals, which are underlined further by the US comments.
 - a. The definition of DE implied by the current proposal is inconsistent. The plenary session of the contact group saw that the approach proposed does not work when unintentional POPs are included, hence the wording as at Paragraph 3 of CRP.28 (quoted in para 5c above). DE is defined as $100 \times (\text{input} - \text{output}) / \text{input}$. The current proposal means that this calculation would be applied to each individual POP, and that unintentional POPs (e.g. PCDD/PCDF) produced in the treatment process would NOT be included.
 - b. DE is a theoretical measure that will be difficult to implement in practice. The intent of the original wording was that the *technology* should be proven capable of meeting the specified DE, not necessarily *each individual unit*. The US suggestion would change this, and in our opinion further undermine the practicability of the whole approach.
 - c. We echo US concerns regarding using DE rather than DRE, and with the specification of 99.9999%. Also, consideration of BAT, in this context,

generally implies that the 'required' destruction efficiency is met, so that e.g. in EU legislation, no specific direct monitoring of the destruction efficiency is considered necessary.

8. The UK has thus concluded that the approach brokered at OEWG is fundamentally flawed and is unlikely to work in practice.

UK Proposal

9. We propose that the way forward is based on a combination of generic approaches B and C (see Table 1), and in that respect builds on the recommendation in Issue Paper 2.
 - a. It is recognised that the destruction efficiency is a function of the POP content, is technology dependent, and is difficult to measure/monitor directly. *The UK does not support an explicit reference to DE/DRE as the defining element in identifying appropriate technologies for the purpose of destruction or irreversible transformation of POPs.*
 - b. *Setting a DRE of 99.9999% is neither a necessary nor a sufficient condition to ensure environmental protection.* In particular it does not apply to a "pure" POP, nor necessarily to non-incineration processes. For example, data for Super Critical Wet Oxidation treatment of DDT and PCB appears to indicate 99.997% and 99.99% DE respectively, with >99.8% DE for industrial TCDD sludge.
 - c. The UK approach is therefore based on the principle that any destruction or treatment process applied to a POP should be controlled such that its output does not cause harm to the receiving environment. Safe design and operating conditions, together with typical expected DE/DRE levels, should be set by developing BAT guidelines for each candidate process.
 - d. In order not to cause harm to the receiving environment, process emission limits should be defined. The appropriate technology and emission limits should be defined by BAT rather than by blanket application of a DE/DRE rule.
10. The proposed UK approach thus requires setting emission limits for each environmental medium, AND requires that each technology meets the criterion of 'best available techniques (BAT)' and is operated according to 'best environmental practices (BEP)'.
11. Our proposal builds on work already underway under the Stockholm Convention. Article 5 of the Stockholm Convention obligates Parties to promote in some cases and require in others the use of BAT, and to promote the application of BEP, for those processes which may produce 'unintentional' POPs (PCDD/PCDF, HCB and PCBs). A Working Group is currently compiling

appropriate guidance, drawing as appropriate from existing sources such as the European Integrated Pollution Prevention and Control (IPPC) Bureau's BAT Reference (BREF) documents. This guidance will cover a number of the most widely available technologies for destroying POPs stockpiles (including incineration and cement kiln co-incineration).

12. It would thus be necessary only to extend this work to include also BAT/BEP guidance for the other commercially available technologies for the destruction or irreversible transformation of POPs, as listed in the *General Technical Guideline*. Much of the work which would underpin the BAT/BEP guidelines will be required in any case, in order to demonstrate that these technologies are indeed environmentally sound.
13. Emission limits for discharges to air and release limits for discharges to other environmental media have been defined in several jurisdictions (e.g. EU and US) for waste incineration, which are based both with regard to BAT, and on considerations of environmental protection. It is suggested that these or similar limits should be applied to all POPs destruction/treatment technologies, and that the EU/US values should be used as the starting point for further detailed discussions.
14. *With respect to emissions to atmosphere*, the EU limit for PCDD/PCDF (and similar PCBs) is 0.1 ng WHO-TEQ /Nm³, while the US limit is similar (but differs in the detail of the definition). The EU controls other emissions of organic compounds (including POPs) via the proxy measure of total organic carbon (which has the advantage of being both practicable and capable of continuous monitoring). This is also consistent with Germany's previous reference to Annex IV to the POP-Protocol under the UNECE-LRTAP Convention for major stationary sources as an appropriate reference source.
15. *With respect to releases to water*, effluent discharge limits for industrial discharges in wastewater have been set by most countries. Limit values vary depending on whether discharge is to sewer or to surface water, and also with the dilution capacity of the surface water. The US have quoted their Universal Treatment Standards for hazardous waste, which set limits for discharge in wastewater, based on discharge to surface water. It is a matter for discussion whether Basel/Stockholm need to define specific limit values, or whether reference can be made, e.g. to 'pertinent national legislation and international rules and standards'.
16. *With respect to solid process residues*, setting concentration limits may prove to be the most controversial part of this process. The arguments are summarized in Table 1. Largely for the reasons set out there, Germany had proposed in Issue Paper 2 that the 'low POPs contents' should be used here also. The current proposal (CRP.28) is based on the lower end of the ranges of 'low POPs contents' currently being discussed, specifically or [1-10 mg/kg] for PCBs and [5 mg/kg] for HCB and the eight pesticides, with no level being proposed for

PCDD/PCDF (as this fell outside of the methodology proposed). We would propose reverting to the German proposal in Issue Paper 2, i.e. using the 'low POPs content' for all types of POPs, including PCDD/PCDF.

17. As regards possible criticism that this proposed approach is not strict enough, our response would be that with a multiple definition, of the type proposed here, reliance in each instance will be placed on the strongest rather than on the weakest 'link'. To take the example of application of a thermal treatment technology to an oil containing say 100 mg/kg PCB, operation to BAT will likely generate a residue containing little or no measurable PCB, so the absolute level here does not come into play.

Concluding Remarks

18. The contact group has agreed that the first priority is to eliminate stockpiles of POPs, which are now largely located in developing countries. If we wish to do this over a reasonable period of time, we need to agree a practical, workable and affordable set of criteria for defining destruction levels, rather than seeking the 'perfect' definition that may be unattainable in practice for developing countries. Put another way, are we seeking to promote the best theoretical approach, or rather the use of a set of good technologies operated to 'best environmental practice'? The UK supports the latter.
19. We believe that our suggested approach is pragmatic and workable. We have taken into account the requirement for environmental protection, AND both existing (largely combustion based) and new(er) (including non-combustion based) technologies, AND also the needs and resources of developing countries.
20. Air and water pollution control generally concentrates the residual pollution from waste treatment processes into the solid residues, on the rationale that these are easier to manage so as to protect the environment. This applies in particular to processes that generate unintentional POPs. This supports setting a level for solid residues from such processes equal to the 'low POPs content' for PCDD/PCDF.
21. Our proposed methodology should work for all 12 POPs, including PCDD/PCDF (whereas the current proposal excluded the latter). In principle, it could also be extended to clean-up technologies for contaminated soil. However, the applicable set of technologies are different, so it might be preferable to continue to set this issues to one side in the short term, to allow the available resources to focus on establishing BAT/BEP for a shorter list of technologies.