



**Summary statement regarding:  
“IPPC: Incineration Sector; Managing the Implications for the Health  
Consultee”  
4<sup>th</sup> March 2005, Birmingham**

Introduction

1. Supporting Primary Care Trusts (PCTs) and Local Health Boards (LHBs) in responding to IPPC applications is a key Chemical Hazards and Poisons Division (CHaPD) responsibility. An effective response requires multi-disciplinary and multi-agency working. This is particularly important when dealing with technically challenging and/or potentially controversial processes. In addition, an efficient response also requires consistency and an appropriate concentration of resource on the most important processes.
2. Key dynamics include the quality of the application and a clear understanding of who does what. Experience has shown that the material presented by the applicant often does not address public health interests and there is the ever present risk of agencies duplicating assessment.
3. Increasingly the Health Protection Agency (HPA) and Environment Agency (EA) have been working together to address these issues and have committed to an early involvement of the HPA in the development of sector guidance and a programme of joint training. This is the second in a series of HPA/EA training seminars and focuses on a particularly controversial sector, **Incineration**.
4. Drawing from industry, regulators, academic researchers and public health practitioners the seminar aimed to raise:
  - awareness of the evidence from the literature of health effects associated with the incinerator sector;
  - awareness of the impact of incineration on dioxin exposure through the food chain;
  - awareness of the implications of the Waste Incineration Directive;
  - understanding of the determination process and the requirements of the Regulator; and
  - appreciation of the key issues in effective risk communication.
5. Speakers assessed the potential impact in an evidence based approach; critically appraising the literature and reviewing potential exposure pathways. Operators, regulators and consultees described their respective requirements and shared experiences. Finally, the issue of communicating risk with the public was addressed in both theoretical terms and through a case study.
6. The seminar attracted 67 delegates from all the key agencies and there was an extremely lively question and answer (Q & A) session. Feedback was overwhelmingly positive.

Summary of Proceedings

Public Health implications of the incineration process-review of the evidence

7. Professor Roy Harrison (Professor of Environmental Health, University of Birmingham) described that the incineration process resulted in three main sources of emissions:

- (1) to atmosphere,
- (2) solid ash residues,
- (3) cooling water.

Attendees were informed that emissions and discharges from a site could not be used as a direct measure of human exposure. The assessment of the health impact on an incineration must consider if a plausible exposure pathway exists. Attendees were informed that provided solid ash residues and cooling water were handled and disposed of appropriately, atmospheric emissions were the only significant pathway to human receptors.

8. The Small Area Health Statistics Unit (SAHSU) at Imperial College London studied cancer incidence among 14 million people living near to 72 municipal solid waste incinerators in Great Britain over the period 1974-1987<sup>1</sup>. On considering the study, the independent scientific advisory Committee on Carcinogenicity (COC) advised the Department of Health that it was 'reassured that any potential risk of cancer due to residency (for periods in excess of 10 years) near to municipal waste incinerators was exceedingly low and not measurable by the most modern epidemiological techniques'<sup>2</sup>. Professor Harrison informed attendees that no further published research warranted a review of this advice.
9. Scientific research has provided little evidence to support the hypothesis that incinerators cause an excess of respiratory disease. Such a conclusion is not surprising given that concentrations of air pollutants due to modern incinerators are small compared to background levels of air pollution due to traffic and other sources.
10. Fierens et al (2003)<sup>3</sup> reported that dioxin levels in the blood of people residing near incinerators were elevated in rural areas relative to urban areas, and is likely due to intake via consumption of locally grown food. Further extrapolation of these data showed that a significant increase in body burden of dioxins is likely to occur only when emissions reach 5ngTEQ/Nm<sup>3</sup> compared with the current regulatory limit of 0.1ngTEQ/Nm<sup>3</sup>.
11. Professor Harrison concluded that epidemiological studies had not demonstrated significant health problems (including additional cancer cases) due to incinerators, even when some studies examined older installations. Current levels of dioxins

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<sup>1</sup> Elliott P, Shaddick G, Kleinschmidt I, Jolley D, Walls P, Beresford J and Grundy C (1996). Cancer incidence near municipal solid waste incinerators in Great Britain. *British Journal of Cancer*, 73, 702-710.

<sup>2</sup> <http://www.advisorybodies.doh.gov.uk/coc/munipwst.htm>

<sup>3</sup> Fierens S, Mairesse H, Hermans C, Bernard A, Eppe G, Focant JF, De Pauw E. Dioxin accumulation in residents around incinerators. *J Toxicol Environ Health A*. 2003 Jul 25;66(14):1287-93.

emissions from incinerators are unlikely to increase the human body burden and indirect estimates of health effects have shown that waste incineration contributes a very small health impact.

#### Dioxin-like compounds and the food chain

12. Dr Stuart Harrad (University of Birmingham) informed attendees that 98-99% of non-occupational exposure to dioxin-like compounds is via the food chain. Dioxin like compounds partition into lipids in the body and are not readily metabolised or excreted therefore the concentration may accumulate in the food chain by several orders of magnitude. Human intake of dioxin-like compounds via air and water are insignificant in comparison to the food pathway. Expert opinion is that 7 dioxins, 10 furans, and 12 polychlorinated biphenyls (PCBs) display dioxin-like toxicity.
13. Individuals or populations consuming foodstuffs grown/reared in the vicinity of any major source of dioxin-like compounds are the groups most likely to be at risk of elevated exposures. Assessment of exposure to dioxin-like compounds should also consider that some foodstuffs are consumed away from the site of production and at present there are insufficient data available to be able to assess the risks from food sourced locally in the vicinity of an incinerator. Foods such as milk may also be batch processed resulting in a dilution and a reduction in the exposure to dioxins.

#### The Waste Incineration Directive and determination of applications by the regulator

14. Dr Amin Anjum (Environment Agency) provided information on the involvement and role the regulator had in overseeing the IPPC process and ensuring that incinerator operations were compliant with the European Commission's Waste Incineration Directive (WID) by 28th December 2005. Dr Anjum explained the requirements of WID which included an increased stringency of emission limits and continuous monitoring of nitrogen oxides (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), carbon monoxide (CO), total organic content (TOC) and hydrogen chloride (HCl) emissions and regular measurements collected for Hydrogen Fluoride (HF), heavy metals, dioxins, dioxin-like PCBs, PCBs and polyaromatic hydrocarbons (PAHs).
15. The decision making process for an IPPC permit for an incinerator plant would include a consideration of the human health implications made by the statutory consultees and the regulator must be satisfied that 'protection of the environment and human health is assured'.
16. The group were informed that permit application is a statutory requirement of all incinerator operators regulated by the IPPC regime. A permit issued to an Incinerator operator is legally binding and will specify: permitted categories of waste; plant operating conditions; emission limit values; monitoring techniques and equipment; immediate reporting of exceedences; and stopping the waste feed if abatement fails. The operator must inform the EA within twenty-four hours of any breach of emission limits. Permit issue is followed by site inspection which includes an examination of monitoring techniques and enforcement action if emission limit values are breached.

#### Regulator's requirements from the Health Consultee

17. Chris Smith (Environment Agency) informed the group that the EA has a statutory duty under PPC legislation to protect public health from environmental pollution. There is guidance provided by the HPA to help PCT/LHB fulfil their role in PPC consultation.
18. Control and regulation of existing sites currently being re-permitted will be improved through IPPC and the Waste Incineration Directive. At locations where background concentrations is already high, incinerator facilities will be re-permitted so long as emission limit values are not breached, because the relative contribution of pollution from the incinerator is small.
19. Health consultee comments on applications are expected to consider the emissions from an installation in context with other pollution sources. The EA anticipate that the PCT or LHB will be the focus for health advice in PPC and play their part in communicating the potential health risks associated with incinerators to the local community. In doing so the PCT/LHB should address the perception of risk by informing local communities that properly managed and regulated incinerators represent a low risk to public health.
20. In responding to IPPC applications, health consultees' comments should be objective, timely and consistent.

#### Public Health Consultee's requirements of the application process

21. Andrew Kibble (Health Protection Agency) re-iterated to the group that protection of health is central to IPPC and that the statutory consultee's role is an opportunity for public health to influence the regulation of industry. The health consultee should provide the regulator with information outside their expertise, an independent view on potential health impacts to the most relevant receptors and ensure that regulatory decisions are based on current health impact information. In doing so it is expected that the application considers the risk based 'source-pathway-receptor' model.
22. In responding to IPPC applications the health consultee should provide advice on the potential health impact of emissions and activities of a particular installation and place any risk into a local context; identify any existing local health issues that may be associated with the installation or its location; identify any future health issues that could be associated with the installation or its location; and provide reassurance to the local community if required. The health consultee should also assess the validity of emission data sets submitted with the application.
23. The health consultee should expect that the regulator: acts on advice provided by health professionals in making decisions on the risks to health from the industries they regulate. The regulator is expected to ensure that the installation is compliant with the EC waste incineration directive (WID) and to take action if significant pollution occurs (for example, if standards or WID are breached).

#### Experience from the Incinerator Industry

24. Ian Crummack (NEWLINC Development Ltd) described the permitting process for an incinerator located in North-East Lincolnshire from the applicant's experience. While the incineration of waste is a viable alternative to disposal by landfill,

operators face opposition from concerned members of the public, politicians and non-government organisations. It was noted that more local authorities are expected to investigate incineration, but that many incinerator projects fail before they reach the IPPC stage.

25. A risk communication and management strategy was described in which applicants should develop a company environmental management policy aimed at addressing public concerns. Mr Crummack advocated the development and implementation of a pragmatic and open communications strategy that included a community residents' panel. Good communications via the media, newsletters, local councils and public meetings was also recommended.

#### Experience from a Primary Care Trust

26. Mike Napier (North East Lincolnshire PCT) stated the importance of the different agencies working together during the planning and permitting process. Key points learnt from the NE Lincolnshire experience was a commitment to dialogue from all agencies right from start of the process which included joint meetings between relevant agencies and lay representation in the form of a non-executive director. Open and transparent communication with the public using a trusted authoritative figure e.g. local Consultant in Communicable Disease Control (CCDC) throughout the process was advocated. PCT/LHBS should allocate sufficient time (a minimum of 6 months) and resources in responding to the planning and IPPC applications from the incineration sector. Experience indicated that the message that waste from outside the local area was not being accepted was well received by the public

#### Dealing with the local population-a case study in managing public panic

27. David Kirrage (Health Protection Agency) presented a case study of an incinerator IPPC and planning application in Kidderminster. The application was rejected despite a County council independent report in favour, the generally positive IPPC response from Chemical Hazard Management and Research Centre (CHMRC), and a reassuring health impact assessment study by the Public Health Observatory at Birmingham. The eventual planning decision issued by the planning authority stated that the public concern was genuine and based on a very real fear of what they see as the unknown health effects of the incinerator. This public perception of risk was a negative factor of some significance in the scales of the decision-making process.
28. David Kirrage placed this decision in the context of the political situation at the time of the application. The local authority's decision was influenced by an unrelated issue of the downgrading of a local hospital, which had damaged the relationship with local health services in the area. In addition, the regional population was divided and did not see itself as a single 'community'.
29. Participants were reminded that community action groups can organise highly effective and 'transferable' campaigns. Risk communication becomes ineffectual if overly technical language is used while conflicting expert advice favours the default position of 'no change'. Public Health professionals also need to consider how they identify and characterise the local community.

### Risk Communication

30. Professor Bob Maynard (Department of Health) presented the complexities of risk perception and communication. People tend not to think in terms of risk to the population as a whole, but rather risk to themselves as an individual. A rational approach to risk would be easy to deal with, but many people have a totally irrational approach to risk, and this is difficult to deal with.
31. People perceive risks differently depending upon whether the risk is imposed upon them, or whether they take the risk through personal choice.
32. He described a risk algorithm; Worry = Risk x Fear, and Acceptability =  $1/\text{Worry} = 1/(\text{Risk} \times \text{Fear})$
33. Fear depends on the extent to which risk is explained. Acceptability is not necessarily rational.
34. This is discussed in Prof Maynard's publication<sup>4</sup>

### Questions and Answers

#### Morning session (Technical and scientific aspects of incineration and IPPC)

35. Roy Harrison took questions immediately after his presentation:
- Q.: There are not many studies on health effects of incinerators. Why? Is it publication bias (absence of evidence not evidence of absence)?**
- A. Cannot say why there are so few studies. It may be that the SAHSU study was so comprehensive, it was thought that it couldn't be added to. Publication bias (i.e. it is easier to publish positive results than negative results) is unlikely.
- Q. We have talked about direct effects, but what about indirect ones e.g. fear and worry?**
- A. Cannot comment on this as not expert in this field.
- Q. We need to be better at attributing pollutant sources, better at communicating e.g. this amount comes from cars, this amount from incinerators etc. Can we produce maps etc?**
- A. Agree that we are not very good at that. Defra and I have tried to put risk into context before. Contribution to pollution from incinerators is very small compared to other sources.
- Q. Has the time come to say that we should do no further epidemiological studies, as we have done them all, and move on to spend time on better risk communication?**
- A. Yes. We reached this point a long time ago. Emissions are now much smaller too. Resources would be better spent on communication.

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<sup>4</sup> Maynard, R.L. (2001). Acceptable risk of environmental air pollution. Int. J. Hyg. Environ. Health 204, 203-206

36. The remaining speakers (Stuart Harrad, Amin Anjum, Chris Smith and Andrew Kibble) held a joint Q&A session at the end of the morning's presentations:

**Q. We have been told that this is a local health issue, but I haven't felt obliged to go out and tell the public through our normal consultation processes. How is the process made public? Which website? How can we follow it?**

**A1. (Andrew Kibble, Chemical Hazards and Poisons Division, Health Protection Agency):** IPPC is an 'open to the public' process. HPA doesn't recommend that public opinion is canvassed on every application - this should reflect public concern. If there is a particularly controversial application the regulator would like the PCT to be involved in dealing with the public on a face to face basis. IPPC documentation is available on public registers.

**A2. (Amin Anjum, Policy Advisor (incineration) Environment Agency):** Responses by consultees go on the public register and this is the same for Local Authority and EA regulated applications. They are not advertised, but the public has the right to see the information.

**A3. (Andrew Kibble):** HPA intends to make all its responses to the PCTs available on the HPA website. The Freedom Of Information (FOI) act means that the public can get hold of them anyway.

**A4. Mark Evans (CCDC Wiltshire Health Protection Team):** There has been a formal request under the FOI act to a PCT with respect to documentation regarding a controversial application for recycling fuel in a cement kiln in Wiltshire.

**Q.: Communicating the information about dioxins is complex. Is there a simple publication that translates the information about dioxins into a simple form?**

**A1. (S. Harrad):** We have a lot of knowledge about waste incineration, emissions and exposures, but communicating this to the public is the biggest problem we face. But no, there is no such document.

**A2.** It is very difficult to translate the information into lay man's terms. We must be careful not to be patronising. There is no easy answer and the problem must be dealt with on a case by case basis. Time and effort must be put in to listening to and addressing the public's concerns.

**Q. Communication is a partnership role. What is the role of the Regulator post IPPC?**

**A. (Chris Smith):** Monitoring, inspecting and a no surprises approach.

**Q.: Will there be a regular dialogue and communication?**

**A. (Amin Anjum):** Review of the permit is required every 4-5 years

**Statement. (Andrew Kibble):** There is a need for dialogue. The PCT should hear from the EA, not pressure groups, if there is a breach of conditions.

**Statement. (Sarah Evans, Housing and Public Protection Department, Wrexham CBC):** Remember the Local Authorities. They are there and can help.

Afternoon session (case studies and risk communication).

37. David Kirrage took questions immediately after his presentation:

**Q. How do you deal with any conflict of interest e.g. if you live in the locality yourself?**

**A.:** You have to show that you are scrupulously clean and present the pros and cons. You cannot give an opinion. I thought that the Health Impact assessment should have been used, but the local authority refused it.

**Statement. (Andrew Kibble): 450,000te rubbish is landfilled at present.**

**Q. The final planning permission commented on the public perception of risk.**

**A.:** The decision maker never referred to the material in public. It was considered in private and then the decision was declared.

38. The remaining speakers (Ian Crummack, Mike Napier and Robert Maynard) held a joint Q&A session at the end of the afternoon's presentations:

Discussions were held with respect to the management of IPPC between the Department of Health, Primary Care Trusts and the Health Protection Agency. It was felt that the management of the process had now improved.