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Target Audience:  
All HSE Inspectors

### THE CONTROL OF LEAD AT WORK REGULATIONS 1998

This OC describes the new and revised requirements of the above Regulations which came into force on 1 April 1998, and gives guidance on enforcement matters. It also provides information about the revised Approved Code of Practice and new forms for use with medical surveillance procedures carried out by appointed doctors and employment medical advisers (medical inspectors).

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## BACKGROUND

1. The Health and Safety Commission's 1994 Review of Regulation identified lead as one area where there was the need to reduce the legislative burden on industry by simplifying and consolidating existing regulations. The Control of Lead at Work Regulations 1980 were therefore reviewed and as a consequence new regulations came into force on 1 April 1998, as the Control of Lead at Work Regulations 1998 (CLAW 1998). In conjunction with this, the *Control of lead at work* ACoP was revised (COP2 - file 298) and the *Control of substances hazardous to health in the production of pottery* ACoP updated (now L60 - file 690).
2. In 1994, the Working Group on the Assessment of Toxic Chemicals (WATCH) reviewed the exposure and biological limits for lead, and subsequent proposals for new exposure and biological limits were included in the new Regulations.
3. To bring the new Regulations into line with the architecture of more modern health and safety legislation, and to help make them easier to understand, they have, wherever possible, adopted the format, control hierarchy and terminology used by COSHH. This will benefit those sectors of the lead industry who also need to comply with COSHH.

### Re-implementing the Lead Directive

4. The new CLAW Regulations also provided the opportunity to re-implement the 1982

Lead Directive (82/605/EEC) which was previously implemented by a combination of the old CLAW Regulations and its supporting ACoP. As a consequence, requirements previously set out in the CLAW ACoP have now been included in the Regulations themselves, which is the preferred implementation method for directives. Examples of provisions which have been transferred to the Regulations include:

- 1) the new occupational exposure limits for lead;
- 2) the suspension levels;
- 3) procedures for air monitoring;
- 4) the frequency of medical surveillance; and
- 5) providing employees with certain information.

### SCOPE OF THE REGULATIONS

5. The CLAW Regulations 1998 apply to all work that is liable to expose employees and others to lead where it is in a form in which it can be inhaled, ingested or absorbed through the skin. As such, their scope is unchanged from the CLAW Regulations 1980, except that, by virtue of the Health and Safety at Work Act 1974 (Application outside Great Britain) Order 1995, they apply to offshore installations, and certain activities associated with offshore installations and offshore pipelines.

### MAIN CHANGES RESULTING FROM THE NEW REGULATIONS (SUMMARY)

6. The main changes are:
  - 1) new occupational exposure limits for
    - a) lead and lead compounds other than lead alkyls, and
    - b) lead alkyls;
  - 2) new blood-lead suspension levels, with the introduction of separate, more stringent levels for young persons (aged 16-17) (YPs) and for women of reproductive capacity (WRC);
  - 3) new lead-in-urine suspension levels for exposure to lead alkyls with the introduction of a separate, more stringent level for women of reproductive capacity;
  - 4) the introduction of blood-lead action levels;
  - 5) a revised air monitoring method;
  - 6) the revocation of many previous prohibitions on work with lead by all women and by young people, and their replacement with a more limited range of prohibitions; and
  - 7) a revised biological monitoring regime.

### MAIN CHANGES OF THE NEW REGULATIONS (DETAIL)

### **New occupational exposure limits**

7. New occupational exposure limits replace the former lead-in-air standards and are as follows:

- |     |                             |                              |
|-----|-----------------------------|------------------------------|
| (1) | lead other than lead alkyls | 0.15 mg/m <sup>3</sup> ; and |
| (2) | lead alkyls                 | 0.10 mg/m <sup>3</sup> .     |

The change here is not to the actual value of the limits, but to their status. There is no longer the previous flexibility which allowed them to be exceeded under certain conditions. The term 'occupational exposure limit' has been used because they neither equate with an occupational exposure standard (OES) nor a maximum exposure level (MEL). Unlike an OES, the new limits are ceiling limits which should not normally (see ACoP para 57) be exceeded. However, they do not require the reduction of exposure to a level as low as is reasonably practicable and so they are not as stringent as an MEL.

8. Regulation 2 defines the OELs as time-weighted averages calculated over 8 hours and this will apply to the vast majority of employees who are exposed to lead at work. However, for intermittent work with lead totalling a few hours during a normal working week of 40 hours, a concession has been agreed whereby an employer may substitute 40 hours as the base reference period for the purpose of deciding whether a concentration of lead-in-air exceeds the OEL (see ACoP guidance para 20).

### **New blood-lead suspension levels**

#### Lead, other than lead alkyls

9. The new Regulations introduce revised blood-lead suspension levels for adults and new, separate and more stringent levels for both women of reproductive capacity (WRC) and YPs. These are as follows:

- |     |                        |               |
|-----|------------------------|---------------|
| (1) | adults, other than WRC | 60 µg/dl;     |
| (2) | WRC                    | 30 µg/dl; and |
| (3) | YPs                    | 50 µg/dl.     |

10. The lower suspension levels for WRC are intended to protect any developing foetus from exposure to lead via its mother's blood, not because women themselves are more susceptible to the effects of lead. The term 'woman of reproductive capacity' is defined by the Regulations as 'an employee in respect of whom an entry has been made in that employee's medical record pursuant to regulation 10(9) by a relevant doctor'. Guidance is then given in the ACoP (paras 25-26 and Appendix 5 *Guidance notes for appointed doctors on the Control of Lead at Work Regulations 1998*). Essentially, a woman may be regarded as being of reproductive capacity if she is capable of conceiving.
11. The reason behind the revocation of many of the employment prohibitions on YPs working with lead is that there is no scientific evidence to show that they are more susceptible to adverse health effects than adults. There is, however, general concern that, as a group, they may need greater protection and hence they have a lower suspension level. This is because they may lack the awareness of risks from work with hazardous substances in general and the maturity to make judgements about

them. There may also be a tendency for them to be given the 'dirtier' jobs, meaning that they are more likely to be exposed to lead.

### **New lead-in-urine suspension levels**

#### **Lead alkyls**

12. The Regulations introduce a revised urinary lead suspension level and a new, separate and more stringent level for WRC:
- |     |                |                             |
|-----|----------------|-----------------------------|
| (1) | adults and YPs | 110 µg Pb/g creatinine; and |
| (2) | WRC            | 25 µg Pb/g creatinine.      |

As far as HSE is aware, the one UK manufacturer of lead alkyls does not employ any YPs or women on its manufacturing process and nor is it likely to in the future. Also, the UK Petroleum Industries Association reports that its member companies are unlikely to employ women on work cleaning out storage tanks which have held gasoline containing the anti-knock additive lead alkyls. However, YPs may be employed on this work and potentially be exposed to lead alkyls.

### **Blood-lead action levels**

13. For workers exposed to lead and its compounds, except lead alkyls, the Regulations introduce a new concept known as the action level. This is a blood-lead concentration whose primary purpose is to warn the employer that an employee's blood-lead level is approaching the suspension level, and to prompt them to investigate the reason urgently. The action levels are:

- |     |                        |               |
|-----|------------------------|---------------|
| (1) | adults, other than WRC | 50 µg/dl;     |
| (2) | WRC                    | 25 µg/dl; and |
| (3) | YPs                    | 40 µg/dl.     |

14. If the action level has been reached or exceeded, the Regulations require the employer to take steps to find out why and, so far as is reasonably practicable, to reduce the employee's blood-lead level below it. The ACoP (para 193) lists a number of considerations that the employer should cover in their investigation. The supporting guidance recommends that where the employer's investigation and remedial action fail to reduce the employee's blood-lead level to below the action level, the employer keeps a written record of the action taken, and repeats the investigation within 3 months.

### **Revised air-monitoring method**

15. Regulation 9(3) reduces the frequency required to carry out air monitoring from 2 to 3 months in accordance with the provisions of the Lead Directive. Monitoring can be further reduced to a maximum of 12 months where the conditions set out in reg.9(4) are satisfied.
16. The ACoP provides some guidance on air monitoring procedures, but a revised HSE publication MDHS 6/3 *Lead and inorganic compounds of lead in air: laboratory method using flame or electrothermal atomic absorption spectrometry* (file 298) sets

out in detail the revised method for measuring the concentration of lead-in-air. This uses the sampling procedure for inhalable dust as described in MDHS 14/2 *General methods for sampling and gravimetric analysis of respirable and total inhalable dust* and amounts to little more than a change in the type of sampling head. This is unlikely to have a significant effect on actual measured levels and, as such, this change can be phased in as equipment is replaced. MDHS 14/2 is based on the European Standards Organisation (CEN) convention for measuring the inhalable fraction of suspended matter.

### **Employment prohibitions**

17. The new Regulations revoke 7 sets of old lead regulations introduced between 1907 and 1925, which imposed prohibitions on all women and/or YPs working in certain lead activities. In addition, they revoke a number of other pieces of legislation either in full or in part. A complete list of the revoked legislation is given in Schedule 3 to the new Regulations.
18. A far narrower range of employment prohibitions for YPs and WRC still remains in lead smelting and refining processes and some aspects of battery manufacture. Full details are given in Schedule 1 to the Regulations. The activities concerned are those most likely to result in blood-lead levels that would reach the suspension level for WRC (ie 30 µg/dl) even when an employer had applied all reasonably practicable controls. The prohibitions are intended to protect any developing foetus from exposure to lead via its mother's blood, and to give added protection to YPs who, because of their lack of experience and awareness, may be exposed to greater risk.

### **Biological monitoring requirements**

19. As well as introducing revised suspension levels and new action levels, the new Regulations introduce a more stringent regime for biological monitoring of employees. The main features are set out in the [appendix](#). Appointed doctors and medical inspectors (MedIs) began medical surveillance procedures based on the new blood-lead suspension levels and monitoring arrangements as soon as the Regulations came into force.

## **OTHER CHANGES**

### **Record keeping**

20. The length of time for keeping certain records specified in the Regulations has been increased and brought into line with the comparable requirements in the COSHH Regulations. Accordingly, employers are now required to keep:
  - 1) records of the examination and testing of control measures and of air monitoring for 5 years; and
  - 2) medical surveillance records for 40 years instead of 20.

Neither the new Regulations nor the Management of Health and Safety at Work Regulations (MHSWR) 1992 specify how long employers should keep records of the assessments they make. However, the new CLAW ACoP (para 52) advises employers that where an assessment involving exposure to lead needs to be recorded under the criteria imposed by the MHSWR, then it should be kept for a minimum of 5 years from the date it was made or subsequently revised, or

from the date on which the work to which the assessment related ceased.

### **Appeals procedure**

21. New reg.10(10) provides employees and employers with a right of appeal to the Executive against a decision recorded by the appointed doctor in the employee's health record. Appeals may be made against a decision that:
  - 1) an employee should not do any further work which would expose that employee to lead; or
  - 2) imposes conditions on any such work; or
  - 3) a woman is or is not of reproductive capacity.
22. The revised suspension levels may result in a significant number of employees having to be suspended from work involving exposure to lead. Generally, when an employee's blood or urinary lead concentration exceeds the suspension level by a few points, it will drop back to below the suspension level within about 6 weeks once the employee is removed from the source of lead exposure. That being the case, HSE does not expect that the anticipated increase in employee suspensions will necessarily result in a significant number of appeals.
23. Any appeals will be made under a procedure approved by the HSC. This requires that applications are sent to HD C, Rose Court (see ACoP paras 221- 222). HD C will then refer them to HSE's Head of EMAS. If the Head of EMAS cannot resolve the matter it will be referred to a review panel of doctors with experience of occupational health. Further details of this procedure can be obtained from FOD senior medical inspectors or from HD C.

### **LEADLESS GLAZES USED IN THE POTTERY INDUSTRY**

24. The Regulations introduce a revised definition of 'leadless glaze' to bring the former definition set out in CLAW 1980 into line with that in the Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (see ACoP Appendix 1).

### **OTHER NOTABLE FEATURES**

#### **'Significant' exposure**

25. In order to introduce the minimum of change for the lead industry, the new Regulations retain many of the principles adopted by CLAW 1980. In particular, they retain the concept of 'significant' exposure to lead, a threshold of exposure which triggers the extra requirements with regard to PPE, air monitoring and medical surveillance (regs.6(3), 9 and 10 respectively).
26. The term 'significant' in relation to exposure to lead is now defined in the Regulations themselves, and is based very closely on that set out in para 10 of the previous ACoP to CLAW 1980. It is specified as meaning exposure in any one of the following circumstances:
  - 1) where any employee is, or is liable to be, exposed to a concentration of lead in the atmosphere exceeding half the occupational exposure limit for

lead; or

2) where there is substantial risk of any employee ingesting lead; or

3) where there is the risk of contact between the skin and lead alkyls or other substances containing lead which can be absorbed through the skin.

- 27. The assessment provisions of reg.5, which supplement those set out in MHSWR reg.3, require that employers carry out their assessments before exposing employees to lead, and determine whether any employee's exposure is liable to be significant. To help employers with their assessments, the ACoP gives examples of the types of lead work which are liable to result in significant exposure (para 36) and those which are not (para 37).
- 28. As in CLAW 1980, the term 'substantial risk' is not defined. When considering whether or not the risk of ingesting lead is substantial, overall exposure should be considered. Ingestion can occur not only as a result of bodily contact with contaminated surfaces and subsequent transfer to the mouth, but also from the contamination of hands and face by airborne lead. Thus, if the atmospheric lead concentration is approaching the significant level, the risk of ingesting lead could also be substantial. Evidence indicating the level of risk from ingestion can therefore be obtained from results of biological monitoring, measurements of surface contamination and measurements of airborne concentrations, as well as from general observations of work practices, welfare facilities etc.
- 29. The new ACoP (para 35) also requires that an employer should treat an employee as being significantly exposed and place them under medical surveillance if certain biological monitoring conditions are satisfied. This applies where, as part of the assessment, the employee's blood-lead or urinary lead levels are equivalent to or greater than the appropriate value specified below.

Blood-lead concentrations		
(1)	WRC	20 µg/dl or greater
(2)	all other employees	35 µg/dl or greater.
Urinary-lead concentrations		
(1)	WRC	20 µg Pb/g creatinine or greater;
(2)	all other employees	40 µg Pb/g creatinine or greater.

This is not a new requirement but simply a development of that formerly set out in para 10 of the ACoP to CLAW 1980.

- 30. However, the ACoP does introduce a new requirement concerning significant exposure. Employers whose work is liable to expose employees to lead are required to carry out an initial medical assessment on all new employees who have been exposed to lead at work in a previous job in the last 3 months. That medical assessment includes measuring the employee's blood or urinary lead level. If it reveals a concentration equal to or greater than the appropriate value specified above, the employee concerned is to be regarded as having been significantly exposed to lead and placed under medical surveillance.

### Architecture of the Regulations



31. The change in the architecture of the new Regulations ([see para 3](#)) means that the separate regulations within CLAW 1980 concerning RPE, PPE and cleaning no longer exist. Requirements on RPE and PPE have become integral to reg.6 (Prevention or control of exposure to lead) and reg.8 (Maintenance, examination and test of control measures) while stipulations for cleaning are expounded by ACoP paras 125-131 under reg.8. However, the separate regulation on eating, drinking and smoking (reg.7) remains, thus emphasising the importance of controlling the risk of ingestion.
32. Additionally, other recent health and safety legislation now has a bearing on the control of lead at work. In particular, this means that the previous separate regulations on welfare provisions which existed in CLAW 1980 are no longer contained in CLAW 1998, but are instead effected by the Workplace (Health, Safety and Welfare) Regulations 1992 (Workplace Regulations). In most cases the relevant statute and regulation are highlighted in the new ACoP, eg Workplace Regulations reg.25 (Providing rest facilities). Where necessary, the ACoP elaborates on these provisions, detailing the specific standards required for exposure to lead, eg ACoP paras 80 and 87 with regard to washing facilities for those employees who are significantly exposed. Note that there has been no consequent weakening of the overall regulatory regime with respect to these requirements, it is just differently expressed.

### **Revised ACoPs and employee's leaflet**

33. In accordance with new criteria approved by HSC for ACoPs, the 1998 edition of the ACoP concentrates on essential requirements and the preferred methods for compliance. Much of the residual material from the old CLAW ACoP which failed to meet the new criteria has been updated and included as supporting guidance. As the lead industry specifically asked to have all practical information on lead published in a single document, some of the guidance material from the 2 former guidance documents, EH 28 *Control of lead: air sampling techniques and strategies* and EH 29 *Control of lead: outside workers* has also been included. Revised guidance notes for appointed doctors and Medls who carry out medical surveillance procedures are also included in Appendix 5 of the ACoP. A revised free employee leaflet MS(A)1(REV) *Lead and you* has also been issued (file 298).
34. The ACoP *Control of substances hazardous to health in the production of pottery*, which gives guidance on the requirements of COSHH as well as CLAW 1998, has been updated to reflect the latter and the changes they introduce. However, this publication has not yet been fundamentally revised in accordance with HSC criteria. This will be done in due course to coincide with the revision of the other ACoPs on the COSHH Regulations.

### **Medical surveillance forms**

35. The medical surveillance forms used by appointed doctors and Medls have also been revised. Forms FOD MS98 *Initial medical assessment* and FOD MS99 *Surveillance record for person exposed to lead* were extensively revised during 1996 but have been further amended to reflect the changes introduced by CLAW 1998. Forms MS61D *Notification to employer of biological test results and record of medical surveillance* and MS61E *Certification of unfitness/fitness* have been redesigned and made compatible with the layout of the other 2 forms, and renumbered as FOD MS102 and MS103 respectively. These new forms should have been in use from when CLAW 1998 came into force.

## **IMPLICATIONS OF THE NEW REGULATIONS**

36. Of the above changes, the reduction in the blood-lead suspension levels is anticipated to have the greatest significance, particularly for adult males. It is estimated that there will initially be a fourfold rise in the number of total suspensions (to approx 300-400) across all industries, with a subsequent decline thereafter.
37. Difficulties of compliance with the new levels are expected to arise principally in the scrap and demolition industries and some parts of the battery industry. In the case of the scrap and demolition industries, this amplifies already existing problems of enforcement under the previous CLAW Regulations and is not due to inherent difficulties in controlling exposure. The battery industry may, however, need to go to extra lengths to improve control.
38. It is also anticipated that the battery industry will incur the largest costs in complying with the new lead OEL.
39. The revocation of many of the employment prohibitions on YPs and WRC may result in more of them taking up work in sectors of the lead industry. The relatively low suspension and action levels for WRC in particular could mean that problems of overexposure will soon occur. A possible consequence of this is that employers may respond by excluding them from such employment, thus, potentially, giving rise to equal opportunity issues. It is important that inspectors are aware of this possibility as they could get drawn into these. There is, however, little that they can do other than suggest that the complainant(s) contact the Advisory, Conciliation and Arbitration Service (ACAS).

## ACTION BY INSPECTORS AND ENFORCEMENT GUIDANCE

### Assessments

40. Employers have had sufficient time to familiarise themselves with the new Regulations, and to review and revise their assessments accordingly. During preventive inspections of premises where there is exposure to lead, inspectors should ensure that, where appropriate, the employer has carried out a revision of the assessment. If the employer has achieved little or nothing, inspectors should require them to take prompt action and, where there are further unjustifiable delays, issue an improvement notice (IN).
41. If revised assessments have identified the need for additional control measures or for further employees to be placed under medical surveillance, then inspectors should ensure that these have been implemented or that a reasonable timetable exists for them to be done. Where inspectors consider assessments to be inadequate in that they do not properly identify:
  - 1) the risks or the means to control them; or
  - 2) the need for appropriate medical surveillance

then they should consider issuing an IN, involving RSG/SSG occupational hygienists and Medls where necessary.

### Women of reproductive capacity and young persons

42. Inspectors should be particularly vigilant to ensure that WRC and YPs are not subject to exposure above their respective biological limits, as a result of changes in

employment practices arising from the revocation of employment prohibitions for these groups. Where WRC and YPs are employed in activities that were previously prohibited, inspectors should ensure that revised assessments particularly address their risk of exposure.

43. With regard to YPs, this includes checking that employers have fully carried out their assessment requirements under the Health and Safety (Young Persons) Regulations 1997. Inspectors should also attempt to discourage employers from allowing school students under 16 on work experience programmes to do any work where their exposure to lead is liable to be significant (see ACoP guidance para 22), although this cannot be enforced apart from those activities where prohibitions for young people in general remain.
44. Exposure to lead alkyls is particularly hazardous and its absorption into the body can produce a rapid toxic effect. Inspectors should ensure, therefore, that adequate and proper safeguards are in force to protect the health of any young person employed on storage-tank cleaning work which could potentially expose them to lead alkyls.

### **Occupational exposure limits**

45. As stated previously, the new OEL should not normally be exceeded. The lead industry as a whole has accepted the 'ceiling' concept of the new limit, but some sectors may find it difficult to comply. As long as employers can demonstrate that they have a programme in place to reduce exposure to below the OEL, inspectors should enforce with a degree of flexibility, especially if employees' blood-lead levels are below the appropriate action level. Employers should agree the timetable for this with inspectors who should consult the relevant FOD sectors (or CHID OSU) on what control strategies are appropriate to particular industries and processes.
46. For those employees exposed to airborne concentrations in excess of the OEL, inspectors should ensure that they have been issued with adequate RPE, but this should not detract from efforts to reduce exposure as far as is reasonably practicable to below the OEL by means other than RPE.
47. Although the Regulations do not require control of lead concentrations further below the OEL, employers may wish to reduce exposure to half the limit or below, thus removing the additional requirements associated with significant exposure.

### **Blood-lead action levels**

48. Appointed doctors and MedIs should normally disclose to employers the names of employees for whom action levels have been equalled or exceeded. During preventive visits, inspectors should make a point of asking whether action levels have been equalled or exceeded and if so, enquire:
  - 1) how many employees were affected;
  - 2) what parts of the process or premises gave rise to this; and
  - 3) what remedial steps have been taken or planned.

If the employer has not initiated measures to bring blood-lead concentrations, as far as is reasonably practicable, below the action levels, inspectors should consider issuing an IN. Once blood-lead levels have dropped to below the

action level, further enforcement action will not be appropriate but, depending on the process, further reductions in lead absorption may be reasonably practicable and inspectors may consider information on blood levels with other evidence to demonstrate that control is inadequate.

49. In some cases, information on blood-lead results may only be recorded in terms of categories as indicated in Table 3 on page 50 of the ACoP. Inspectors should refer to this table to determine whether employers have breached the action levels. For WRC, further enquiries may be necessary to establish whether this is the case.

### **Suspensions**

50. Where medical surveillance is not carried out by a medical inspector, the ACoP (para 213(c)) stipulates that the appointed doctor should forward a copy of the record of any employee, whom they have certified as being unsuitable for work with lead, to the appropriate MedI within 7 days. On receiving this, MedIs should inform the relevant inspection group responsible for the premises that a suspension has been notified.
51. Before making preventive inspections to relevant premises, inspectors should check to see whether any suspensions have been notified and then, during the inspection, ensure that the employer has complied with the requirements of the reg.10(5) and the ACoP (para 210), and has made efforts to identify and rectify the factors which have caused suspension levels to be exceeded. Where the employer has not implemented measures to bring blood-lead levels back below suspension levels and, where reasonably practicable, to below action levels, inspectors should consider issuing an IN. In cases where inspectors judge failure to act on suspension levels as posing a serious risk to health, a prohibition notice and/or prosecution may be more appropriate. Inspectors should consider prosecution where repeated breaches indicate that the employer has failed to manage the risk overall, even if they implement remedial measures after each single breach.

### **Blood-lead levels - general**

52. Information other than whether suspension and action levels have been breached can also be usefully obtained from blood-lead levels. Trends of results can give indications of the effectiveness of control measures and sudden changes may be significant. Inspectors should encourage employers to monitor results to look out for these, although any interpretation should only be done with the advice of the appointed doctor and after consulting the workforce. If inspectors wish to interpret such data themselves, they are advised to consult RSG/SSG MedIs and occupational hygienists.

### **Significant exposure**

53. When examining employers' assessments inspectors should check on whether any employees have been identified as likely to be significantly exposed, and for those that have, ensure that:
- 1) they are under medical surveillance, with appropriate health records maintained;
  - 2) they have been issued with suitable protective clothing;
  - 3) air monitoring is carried out at the appropriate intervals.

If these matters are not complied with, inspectors should consider issuing an IN.

54. When assessing whether there is significant exposure arising from a substantial risk of ingestion of lead, inspectors should pay particular attention to the degree of contamination of surfaces in the workplace and work items (tools, cloths etc) and how lead can be transferred from these to body surfaces. Improved techniques now exist for measuring surface contamination and inspectors are encouraged to use these, consulting RSGs/SSG for advice. They should also take into account atmospheric lead concentrations ([see para 28](#))
55. Before an assessment of significant exposure is reduced to 'not significant' as a result of additional control measures, inspectors should check that the reassessment takes into account the confidence which can be placed in the new control measures and the likelihood that they will be able to guarantee a continued and reliable reduction in exposure. Where there is reliance on the use of RPE to minimise exposure there will probably not be sufficient confidence in this as a control measure to allow an assessment of significant exposure to be reduced purely because RPE is provided. It may be advisable to seek specialist advice here.
56. With respect to skin exposure from work with lead alkyls, adequate PPE is essential. The correct use of PPE should ensure that employees are not significantly exposed. When judging whether this is the case, inspectors should ensure that the employer has satisfactorily addressed the following aspects:
  - 1) the training of operators;
  - 2) the supervision of the wearing of PPE;
  - 3) the arrangements for the decontamination, repair and renewal of PPE; and
  - 4) the discipline on site.

If there is any evidence that employees do not always wear protective clothing as required, then they should be regarded as being significantly exposed.

### **Air monitoring**

57. Inspectors should encourage employers who carry out air monitoring to phase out the current single-hole sampler in favour of one which meets the specifications given in MDHS 6/3 and MDHS 14/2. However, inspectors should not attempt to force them to make the change.
58. Air monitoring is required when exposure is considered significant and this should also apply when significant exposure arises principally due to the risk of ingestion and/or skin absorption. These are often associated with high airborne lead concentrations and airborne monitoring can be justified on the grounds that it is useful to know the extent to which air contamination is under control.
59. Where exposure to lead is not significant, occasional air monitoring may nevertheless be desirable to ensure that control measures are effective and airborne levels are not likely to exceed half the occupational exposure limit.

### **Welfare provision**

60. It is important that employers give proper consideration to the provision of welfare facilities in the overall strategy to control exposure to lead. Inspectors should, therefore, ensure that employers have taken into account the relevant requirements of the Workplace Regulations (or, in the case of construction or demolition, the Construction (Health, Safety and Welfare) Regulations) and should be prepared to enforce these where this is not the case, even where the explicit requirements of CLAW 1998 themselves have been met. Inspectors will need to gauge carefully the level of enforcement in proportion to the risk of exposure by ingestion resulting from the inadequacy of welfare facilities. Where these are manifestly substandard in relation to the requirements of the Workplace Regulations as interpreted by the lead ACoP, inspectors should consider prosecution.

### **Information, instruction and training**

61. Regulation 11 of CLAW 1998 states requirements regarding information, instruction and training. Employers should issue a copy of *Lead and you* to each employee or their own leaflet which gives equivalent information and be prepared to provide this if requested by employees (see ACoP para 228). This will be in addition to providing information on air monitoring and medical surveillance which has now become an explicit requirement under this regulation. Inspectors should ensure that employers comply with this, but where the levels of exposure are routinely low, they may judge that a leaflet concentrating on personal hygiene, but not giving detailed information on suspension levels, is adequate.

### **Long service**

62. During preventative visits, inspectors should establish whether the employer concerned has any employees who are covered by the 'grandfather provision' ([see Appendix, para 7](#) and ACoP paras 197-199) and, if so, what information the appointed doctor has provided on the most recent blood-lead measurements of these employees. Inspectors should make suitable enquiries to determine whether the employer is making every reasonable effort to reduce their blood-lead concentrations to below 60 µg/dl.

### **Demolition and scrap industries**

63. Under CLAW 1980, both the demolition and the scrap industries gave rise to relatively high percentages of employees whose blood-lead level exceeded the suspension level. The itinerant nature of the employment in these industries may mean that some workers who are significantly exposed to lead are not under medical surveillance, probably resulting in under-recording in HSE's medical surveillance figures in this area, which gives further cause for concern. With the lowering of the suspension level under CLAW 1998 this situation is expected to worsen.
64. When planning preventive visits to premises involved with the processing of scrap, inspectors should attempt to identify those activities where employees are liable to be exposed to lead, especially where hot cutting work is carried out. Inspectors should then target these activities during visits to check that employers are complying with the requirements of CLAW 1998, considering all matters in paras 40-60, but particularly ensuring that employers:

- 1) comply with the requirements of significant exposure;
- 2) provide suitable RPE for employees exposed to levels above the OEL;

3) make available and properly maintain suitable washing and changing facilities and encourage employees to make use of them; and

4) comply with the requirements for YPs, where the latter are employed.

65. When coming across demolition work liable to cause exposure to lead, especially where this involves:

1) burning off lead paint (which can contain up to 40% lead); or

2) hot cutting lead-painted or lead plumbing materials (which can give rise to high concentrations of lead fume)

inspectors should check that employers have made assessments under CLAW 1998, again paying particular attention to the matters in [para 64](#).

### **Construction (Design and Management) (CDM) Regulations and work with lead**

66. In the construction/demolition industry, lead is most likely to be encountered during the demolition or refurbishment of structures containing lead paint or plumbing materials. Clients should provide information on the presence of any such materials, for inclusion in the pre-tender health and safety plan.

67. Where there is likely to be burning off of lead paint or hot cutting of lead-based materials, designers should have adequate regard to the risks of these operations and follow the hierarchy of risk control required by CDM reg.13(2). Where the risks cannot be avoided (eg by removing the need for hot work), the designers should provide the planning supervisor with information for inclusion in the pre-tender health and safety plan.

68. In developing the construction-phase health and safety plan, principal contractors should include reference to the management of lead work and involve any contractors who will be carrying out, or may otherwise be affected by, the work. The management of such work should include reference to the requirements of CLAW and in particular, how those who are likely to be significantly exposed to lead are to be identified and put under appropriate medical surveillance.

69. Inspectors should ensure that all appropriate parties comply with the above requirements.

### **Lead battery manufacture**

70. Most exposure to lead occurs in the early stages of battery manufacture. Once pasted plates have been assembled into their cases, there is a reduced risk of exposure in the later stages of the process. The production process can be divided as follows:

1) grid casting;

2) lead oxide manufacture;

3) lead paste mixing;

4) plate pasting; and

5) plate assembly (into cells or batteries).

Any other handling of pasted plates (especially when dry) may lead to significant lead exposure.

71. In all of the above areas, exposure to lead may occur by inhalation of dust (or fume at casting process) or ingestion following contamination of hands or work clothes. Effective control of lead must target the areas in which these exposures are occurring. Dust minimisation (by wetting) and regular cleaning of contaminated areas are important control measures where dust is likely to be inhaled. Attention to personal hygiene and minimising contamination of clothing are crucial in preventing ingestion of lead. An Engineering & Utilities Sector Information Minute will be issued shortly to give further details of controls and action required.

### FEEDBACK ON THE NEW REGULATIONS

72. The impact of the new Regulations will be reviewed in about 2-3 years' time, when the suspension and action levels for adults (other than WRC) may be brought into line with those for YPs. In order to assist this the FOD Occupational Health and Environment Unit (OHEU) and CHID Operational Strategy Unit request that inspectors forward brief reports arising from both preventative inspections and enforcement visits which highlight particular difficulties with compliance and detail the measures taken to overcome them.

29 March 1999

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### APPENDIX (paras 19 and 62)

### BIOLOGICAL MONITORING REQUIREMENTS

#### All employees

1 Employers whose work is liable to expose employees to lead are required to have an initial medical assessment carried out for all new employees who have been exposed to lead at work in a previous job in the last 3 months, irrespective of whether their exposure in their new job is assessed as 'significant' (ACoP para 182).

2 An initial medical assessment should be carried out, so far as is reasonably practicable, on all new employees assessed as liable to be significantly exposed to lead **before** the employee starts work involving exposure to lead, and in all cases, no later than 14 **working** days after exposure. The former fall-back period of 14 days has been extended to 14 **working** days to help smaller employers who do not employ a full-time appointed doctor, and who may have difficulty in complying with the former 14-day requirement during periods when the appointed doctor they use is on leave or otherwise unavailable (ACoP para 185).

3 The interval between periodic medical assessments should not exceed 12 months (ACoP para 188).



### Exposure to lead and lead compounds, except lead alkyls

4 The conditions for reducing the frequency of measuring an employee's blood-lead level have been made more stringent; the revised conditions are set out in the Table 3 of the ACoP (para 189).

### Exposure to lead alkyls

5 The intervals for carrying out periodic urinary lead measurements have also been tightened and are summarised in Table 6 of the ACoP (para 205).

### Young persons and women of reproductive capacity

6 Those who are significantly exposed to lead (other than lead alkyls) and placed under medical surveillance should have their blood-lead, (and, if appropriate, urinary lead levels) measured at least every 3 months (ACoP para 191).

### Long-service and more elderly employees

7 The ACoP to CLAW 1980 contained a concession for long-service employees and more elderly employees whose blood-lead levels exceeded the suspension level. This was commonly known in the lead industry as the 'grandfather clause or provision'. The employees concerned did not need to be suspended from work involving exposure to lead so long as certain biological conditions were satisfied. The same concession has been retained in the new ACoP (para 198(a)) for employees concerned who satisfied its conditions **before** the new CLAW Regulations came into force. At the request of the TUC and unions who wanted to preserve the jobs of the employees who fell into the 2 categories concerned, a new concession has been introduced for the same categories of employee who satisfied other more stringent conditions on or after the new Regulations came into force (para 198(b)).

8 For those older and longer-serving employees who are not removed from work involving exposure to lead, employers should nevertheless make every effort to reduce the employee's blood-lead level to below 60 µg/dl.

### Employees whose exposure is intermittent or infrequent

9 An employee's exposure to lead may be infrequent or intermittent during a working week of 40 hours, but it may nevertheless exceed half the OEL when averaged over 8 hours, and so be significant as defined by the Regulations. Paragraph 23 of the ACoP sets out the conditions which, if satisfied, allow the employer to treat the employee's exposure as not significant and so avoid the need to place the employee under medical surveillance.

