Occupational health provision and health surveillance in the semiconductor industry

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Aims
To identify the nature of occupational health provision in UK semiconductor-manufacturing plants.
To identify the level of industry compliance with legal health surveillance requirements.

Method
A national inspection programme was carried out by Health & Safety Executive inspectors using a developed protocol.

Results
A wide range of occupational health provision was identified from none to use of an accredited specialist. The majority of work was of a reactive nature even where there was specialist occupational health input. Seven companies were identified as not meeting legal compliance and one as having unacceptable compliance for health surveillance.

Conclusions
The spectrum of occupational health provision was very wide. Where health surveillance was provided, it was poorly targeted with limited interpretation and feedback to management.

Key words
Health surveillance; occupational health provision; semiconductor industry.

Introduction
In 2002, the Health & Safety Executive (HSE) carried out an inspection programme of UK semiconductor-manufacturing plants to ensure compliance with legal obligations and a precautionary approach to control of exposure to substances potentially hazardous to health. The inspection covered health and safety management systems including occupational health.

The relevant legal obligations are encompassed in the Management of Health and Safety at Work Regulations 1999 [1] and the Control of Substances Hazardous to Health (COSHH) Regulations 2002 [2].

This paper presents a snapshot of the type and scope of occupational health provision across this industry in 2002.

Method
The national inspection programme was carried out between February and May 2002. The companies visited were identified by Standard Industry Classification code on the HSE database of companies, knowledge of the industry and from discussions with industry representatives.

All companies approached and those that carried out wafer fabrication were inspected, a total of 25 sites belonging to 23 companies. A protocol for use during the inspection was developed and refined by members of the inspection teams to ensure consistency of approach using risk control indicators, e.g. best practice, minimum legal requirements, below minimum legal requirements, unacceptable compliance and a questionnaire for occupational health management.

Information gathered during the inspection visits was fed into a database and analysed centrally within HSE. The full detail of all aspects of the inspections has been published [3].

Results
Four of the 23 companies (17%) had no occupational health provision.

Of the remaining 19, four (17%) employed occupational health nurses supported by either a general practitioner (GP) or occupational physician working as an external provider.

All other companies used the services of external providers. Nine (39%) contracted the services of a qualified occupational health nurse and an occupational health nurse working as an internal provider.

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physician. The remaining six (26%) used a contract occupational health nurse alone, GP alone or contract nurse and GP.

Most occupational health professionals linked to the company through personnel; links with safety professionals were less well established.

Almost half the companies had access to an occupational health physician on a part-time basis but very few had made site visits to familiarize themselves with the plant and processes. Site visits were much more commonly carried out by occupational health nurses, the majority of whom provided a full- or part-time service to one site.

Most sites had poor or non-existent policies in relation to occupational health and the majority of doctor time was spent on reactive work.

The inspection findings using the risk control indicators showed that 15 of the companies met minimum legal requirements, two of these were considered to follow best practice. Seven companies were rated as not meeting minimum legal requirements but tending towards this and one company was rated as having unacceptable compliance.

Eleven companies (48%) did not carry out any health surveillance; four of these had no occupational health provision, and of the remaining seven several had made a positive decision not to carry out any form of surveillance for arsenic but none had reviewed their chemical inventory looking to positively identify chemicals which might have required surveillance.

Of the remaining 12 companies, 10 (43%) carried out some form of surveillance for arsenic on the basis of use rather than risk assessment, one company carried out lung function assessments for solderers, identified on the risk assessment, and one company performed audiometry.

Many companies did not have a system for identifying carcinogens or other substances requiring health surveillance; the safety professionals did not consider this aspect and the health professionals were largely not involved in the risk assessment process. As a consequence, companies did not keep the appropriate health record, nor in some cases carry out health surveillance or health monitoring as required by COSHH Regulations 2002.

Many sites believed that there was minimal exposure to arsenic and for this reason did not consider skin surveillance or biological monitoring to be appropriate, but in most cases this view could not be substantiated by environmental sampling and inspection identified potential for exposure, particularly of maintenance staff involved in routine or breakdown maintenance. Where biological monitoring for arsenic was in place it was largely untargeted and the methodology poorly understood.

Discussion

The law requires every employer to appoint competent person/s to assist with compliance in relation to health and safety. The spectrum of occupational health expertise found in the industry was very wide, ranging from no provision to involvement of both an occupational health nurse and an occupational health physician. Four companies had no provision at all.

Where specialists were employed, the level of integration with other health and safety professionals was generally poor, with a few exceptions where individual occupational health nurses had established good links with the relevant personnel.

The majority of work carried out by all doctors was of a reactive or routine nature and did not utilize specialist skills, where they were available.

As most health professionals were not included in the COSHH risk assessment process, there was no opportunity to assess the need for health surveillance for current or new chemicals or processes, for intermediate products or to gain an understanding of potential exposures particularly in relation to breakdowns and routine maintenance.

There was poor targeting of employees and no sampling strategy where health surveillance and biological monitoring were in place. The results and their interpretations were poorly understood and feedback to management was often omitted.

The requirements for health surveillance in this industry are not large; however, the lack of involvement of occupational health professionals at the appropriate points in the chemical risk assessment process, coupled with the failure to specifically identify carcinogens, led to the lack of a competent assessment of health surveillance need.

Conflicts of interest

None declared.

References