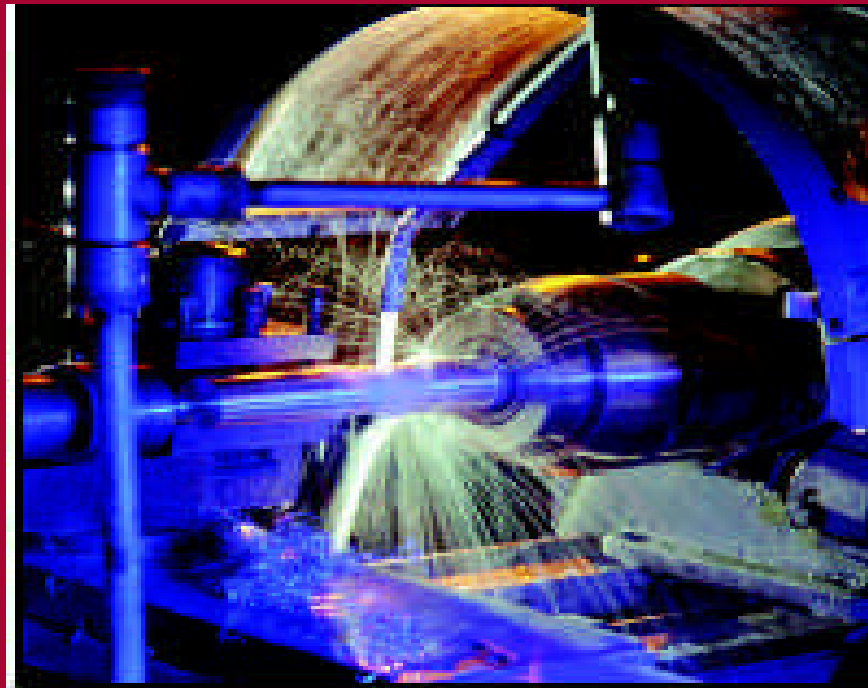


www.hse.gov.uk/metalworking



Outbreak of lung disease at Powertrain

Investigation and emerging
lessons

Why it matters

Outbreak has changed the perception of risk

Thousands of workplaces use metalworking fluids

Tens of thousands of workers are exposed

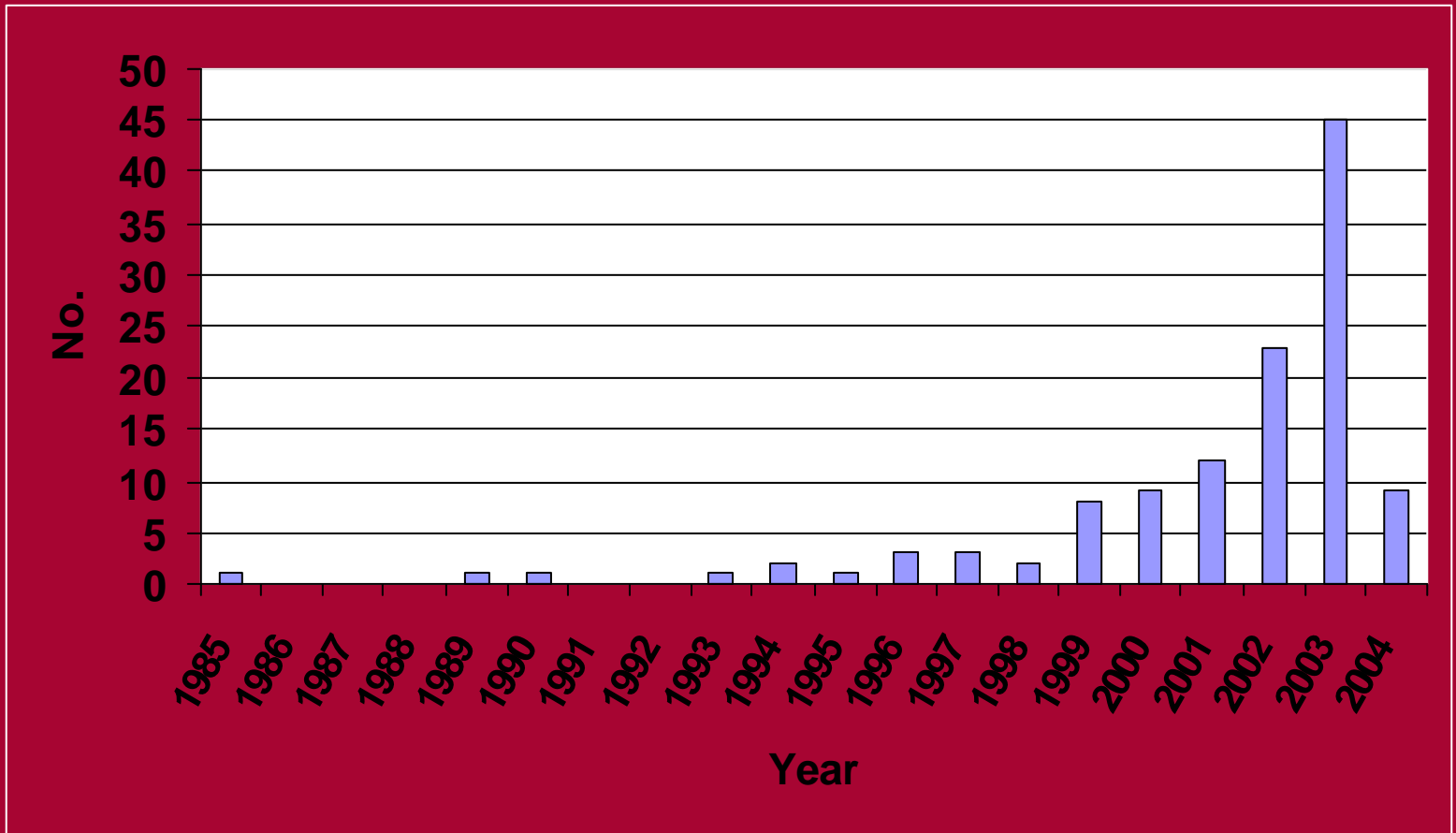
Investigation

- Multi – agency investigation
- HSE
- Health and Safety Laboratory (HSL)
- Birmingham Chest Clinic (BCC)
- Other experts and peer review

Outbreak – of what?

- The world's largest recorded outbreak linked to metalworking fluids (MWF)
- 101 definite and probable cases diagnosed
- 87 - occupational asthma (OA)
24 - extrinsic allergic alveolitis (EAA)
- Some have more than one disease
- Some very badly affected

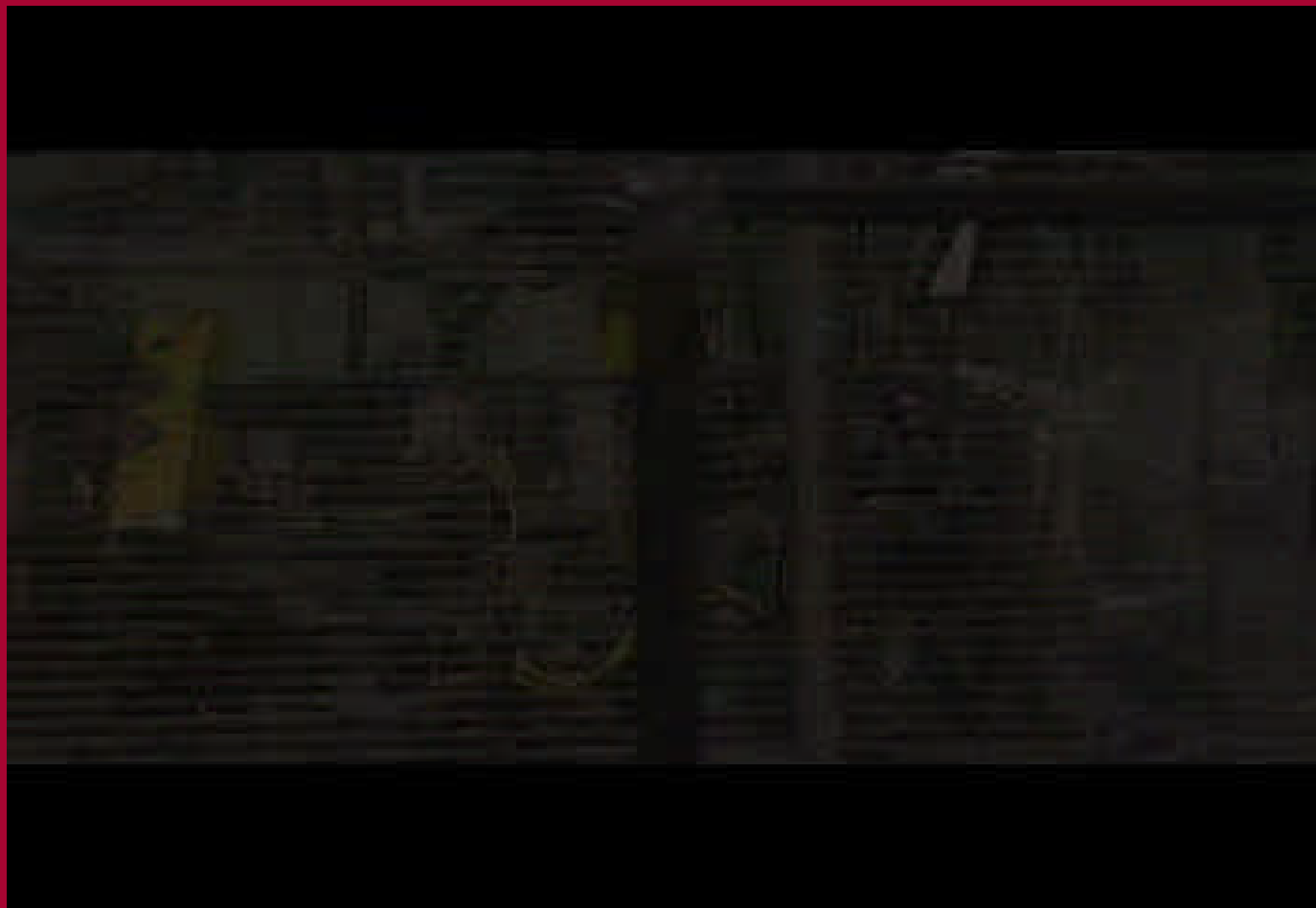
Outbreak – onsets of breathlessness - when?



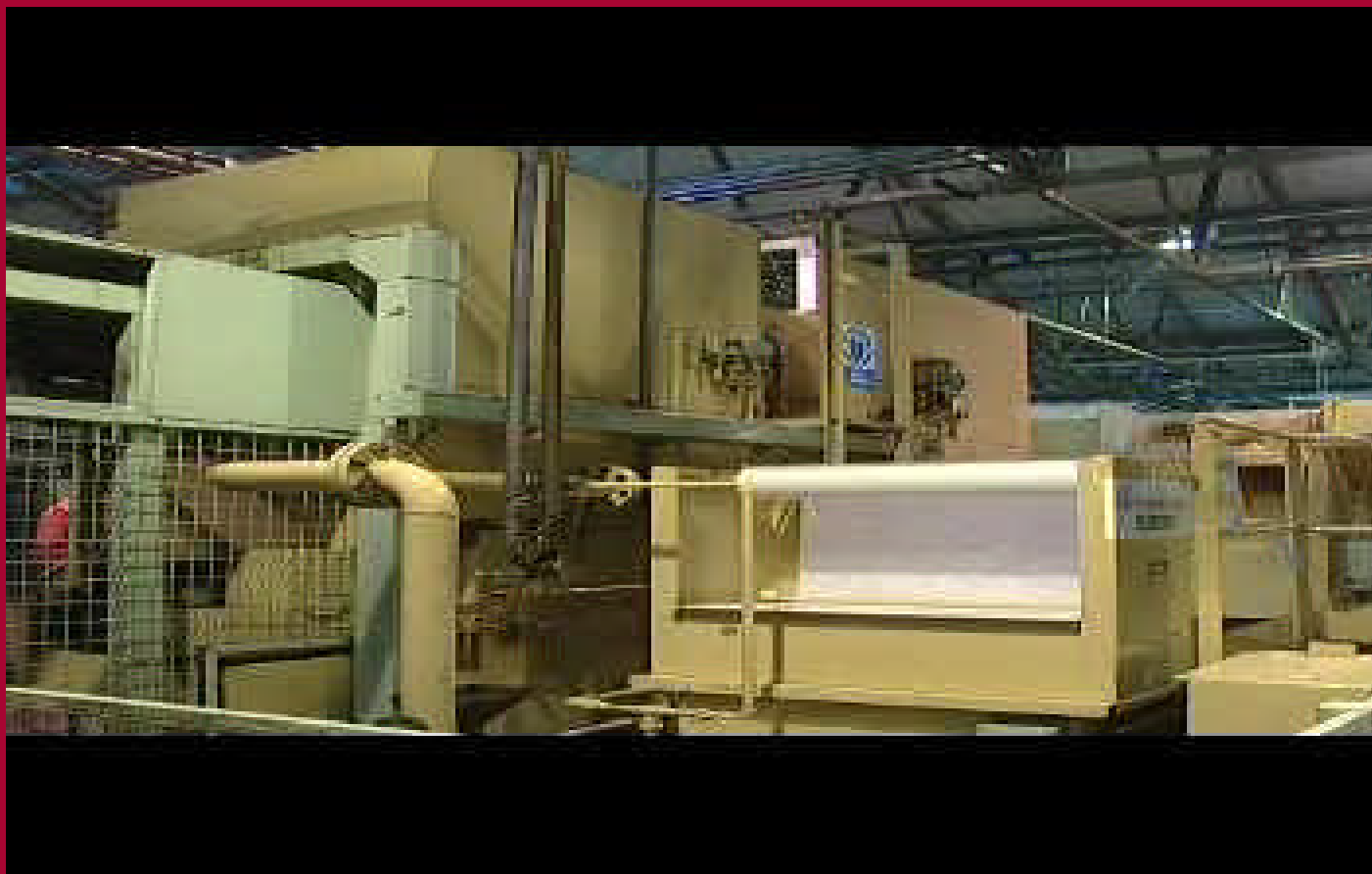
Outbreak – cause?

- Mist from metalworking and possibly also washing machines

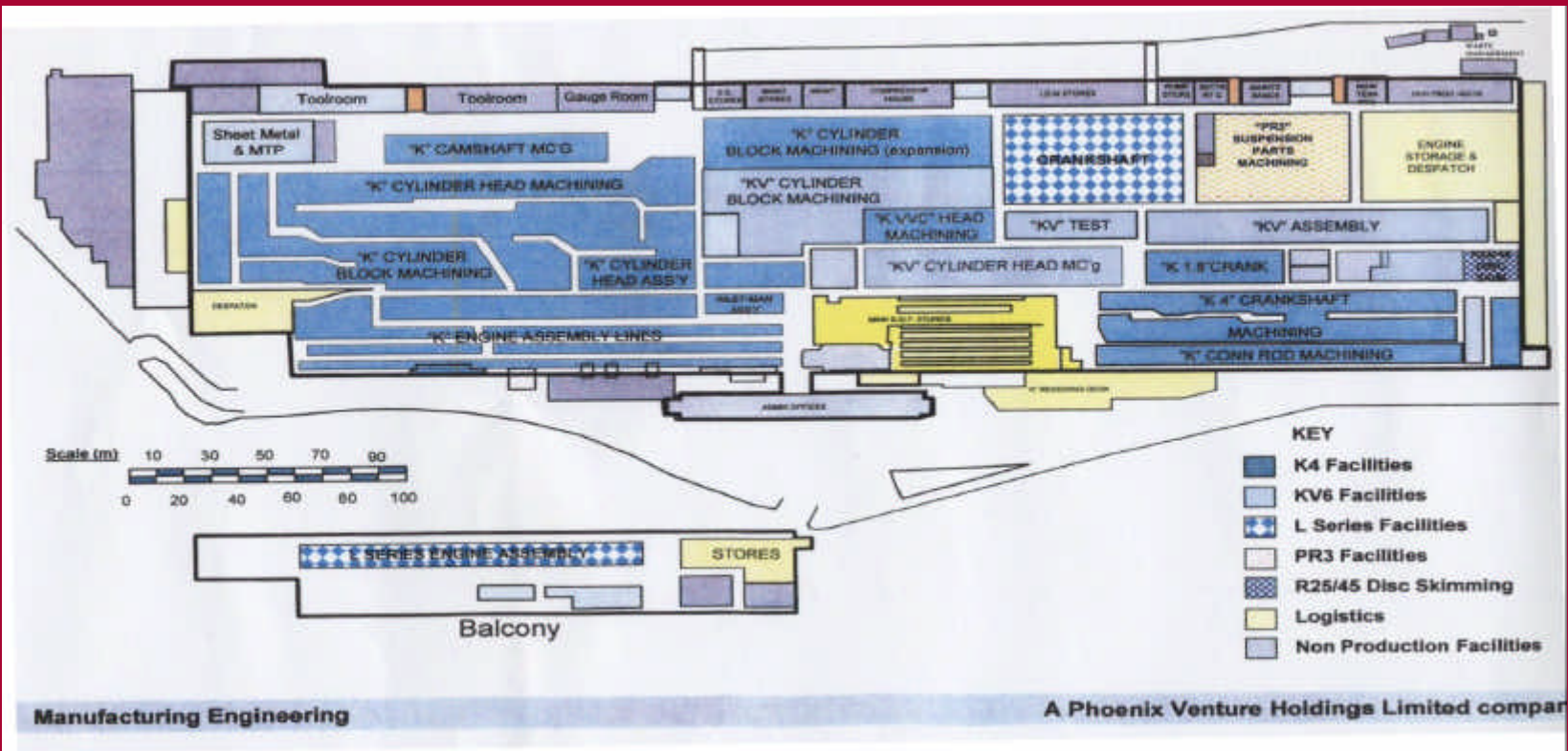
Mist from metalworking



Mist from washing



Mist – where?



How much mist was there?

- Amount of mist variable
- When measured during the outbreak found to be within guidance values
- 1mg/m^3 for mwf concentrate and 3mg/m^3 for mineral oil
- Guidance values now withdrawn

What was in the mist?

- Metals from machining
- Chemicals – additives
- Micro- organisms, including bacteria
- Proportions and make – up of constituents change in use

Metals and chemicals

- Metals, potential sensitisers and chemical constituents
- But none calculated to be at harmful levels
- No reaction to unused mwf from large sump

Bacteria (measured in 2004)

- Large MWF sumps had traces of two types of bacteria (*Ochrobactrum* and *Acinetobacter*)
- Smaller MWF and washing machine sumps had up to 10 million bacteria (including *Ochrobactrum* and *Acinetobacter*) and 300,000 endotoxin units per ml
- No *Mycobacterium* found

Bacteria tests

- Sera from 3 workers with EAA and 2 with OA showed response to extract from large Mayfram sump
- Sera from 10 workers with EAA showed response to *Ochrobactrum* and *Acinetobacter* from Mayfram
- Larger scale tests showed a few responses to specific bacteria

Chest Clinic Breathing Challenge tests

- One worker with EAA and one with OA
- Significant reaction to samples of used MWF from largest (Mayfram) sump
- No reaction to samples of unused MWF for same sump

Cause summary

- Used mwfs
- Bacteria played a part in EAA
- Low likelihood of other causes
- Enough information gained to clarify risk factors and warrant new guidance

Research

- Continuing epidemiology
- How fast can bacteria grow in fluids?
- Can mist transfer bacteria between machines?
- How dangerous are other processes in other industries which produce a lot of mist?

Emerging lessons

- Risk assessments need to address risk of serious lung disease, including EAA
- Fluid management needs to include measurement and control of bacteria in fluids
- Better prevention/control of mist needed
- Health surveillance needed where there is exposure to mist

Doing better – how?

- Updated guidance at www.hse.gov.uk/metalorking
- Reducing risks at large users – questionnaires with follow - up
- Reducing risks at small users – road shows with follow – up
- Publicity – HSL workshop, articles, MACH'06



Outbreak reports

- Emerging lessons (HSE)
 - Epidemiology (BCC)
 - Immunology (HSL)
 - Links to reports will be at
-
- www.hse.gov.uk/metalworking

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