

United Kingdom

US carcinogen regulations urged in UK

ANIMAL tests should be relied on to indicate whether a chemical will be carcinogenic in humans, says a trade union document on occupational cancers published last week.

"When it comes to the interpretation of test results" says the document "the UK guidelines fall far short of their US counterparts. It is stated in the US guidelines that a positive result in animal tests is to be accepted as evidence of human carcinogenicity. Not so in the UK guidelines, where it is stated that 'extrapolation is a difficult procedure'".

Produced by Britain's half-million strong Association of Scientific Technical and Managerial Staffs, the report was launched at a press conference by ASTMS General Secretary, Clive Jenkins. "Too many of our members are dying" he said. "Tens of thousands of new chemicals have been introduced to the workplace since the war. Companies have acted irresponsibly. We want exposure to carcinogens reduced to zero. We want a new approach in law."

Sheila McKechnie, ASTMS Health and Safety Officer, said that her union "was not attempting to ban all chemicals". Of 7,000 or so chemicals that have been tested so far, says the report, "only 600-800 have shown any evidence of carcinogenicity".

Epidemiological studies — or 'body counts' as the report calls them — come too late: "keeping track of the effects of new (and existing) chemicals by observation of the effects on workers — if relied on exclusively — turns the work place into a giant laboratory for the conduct of an experiment in carcinogenesis. No trade union can accept this."

The evidence is that animal carcinogens are human carcinogens, says the report. "Even if subsequent research unearths some exceptions to this rule, it must be taken as a conservative regulatory principle, that is a principle erring on the side of safety. To refuse to accept the evidence of animal bioassays means, in practice, to insist on counting bodies as the only valid method of identifying carcinogens. This is the position usually adopted by industry — especially an industry threatened with the banning of some profitable commodity."

ASTMS is demanding a comprehensive licensing scheme for toxic substances. Under the scheme:

- Only potentially useful substances should be submitted for test.
- The tests should be carried out in public or independent laboratories and financed by a general levy on the industries supplying the substances.
- Only substances which pass these tests should be licensed for commercial use, subject to safeguards dictated by the results of the toxicity tests.



Jenkins: would love health strike

● All companies handling licensed substances should be compelled to keep comprehensive records.

The process of awarding compensation should also be completely overhauled, said Jenkins. "Some firms have internal compensation. We are urging our members not to accept it. One firm — I don't want to name it — went to a man on his death bed and persuaded him to accept the firm's compensation. He would have done much better in the courts."

ASTMS recommends that 'occupational cancer' be recognised as a broad category of industrial disease, and that cancer victims should be automatically entitled to compensation if they can show they were exposed to a known carcinogen, or were involved in an occupation that clearly shows an elevated risk of cancer. The scheme could be funded by a specially floated National Cancer Insurance scheme, drawing on both public funds and general levies on industry. "There is great sympathy in the Trades Union Council for our views" said Jenkins.

Would ASTMS take strike action over

this issue? "I'd love a strike over health" said Jenkins.

However, the US regulations urged by ASTMS are themselves under pressure, as reported in *Nature* (24 January, page 320). In the latest proposals of the US Occupational Safety and Health Administration, it is expected that the list of 'category 1' carcinogens (ones where scientific evidence of carcinogenicity is strong) will have only 150 chemicals, and only 10 of these a year will be selected for 'special attention'. US industry still feels the regulations to be too restrictive, while unions are attacking OSHA for lowering its sights.

At its press conference, ASTMS was attacked on the scientific basis of its report, which claims that 20-40% of cancers can be traced to occupational causes or synergisms. In particular two of its sources have been roundly attacked: Samuel Epstein's book, 'The Politics of Cancer', and a joint report of the US National Cancer Institute, National Institute of Environmental Health Sciences, and the National Institute for Occupational Safety and Health, titled 'Estimates of the fraction of cancer in the US related to occupational factors'.

However, said Sheila McKechnie, ASTMS did not want their recommendations to stand or fall on technicalities. If the proportion was 40% or 5% it was still too much.

So how will British industry respond? "We are trying to get unions involved in testing these chemicals, to make sure they are unbiased" said Sheila McKechnie. "Initially testing will have to be done in industry; but so far we have met no resistance from companies on the pre-testing of new chemicals. It's chemicals where companies are already deeply involved where there is a problem."

Robert Walgate

Coal produced electricity the cheapest, says US economist

AN American energy economics consultant who waged a successful environmental battle against the emissions of coal-fired power stations in the early 1970s argued last week that electricity produced from coal in the late 80s will be cheaper than nuclear electricity. If he were right, break-even would only occur in the UK if coal tripled in real price over the next eight years.

The consultant, Dr Charles Komanoff, presented his views at a joint session of the Parliamentary Liaison Group for Alternative Energy Strategies and the

environmental group Green Alliance. (Parligaes is a rapidly growing association of MPs and others designed to provide a source of information in the House of Commons alternative to that of the national energy bodies in the case of electricity, largely the United Kingdom Atomic Energy Authority and the Central Electricity Generating Board.) Later, Komanoff gave evidence before the House Select Committee on Energy.

In both fora, Komanoff based his argument on an analysis of capital cost escalation in the 162 power plants built in

the US between 1971 and 1978. Of these, 116 were coal plants, and 46 light water reactors (of which 33 were pressurised water reactors — PWRs).

Over this period the coal plants suffered a real cost increase of 68%. Almost all of this increase, said Komanoff, could be accounted for by new apparatus to control emissions, such as SO₂ scrubbers (half the increase), improved efficiency in electrostatic precipitators and the like.

The nuclear stations built over the same period became more expensive at almost twice the rate. They increased by 128% in real terms.

"If we are to project these trends" said Komanoff "we need an hypothesis for the increases". In the coal case, the reason was environmental controls. In the nuclear case, "it is impossible to attribute specific costs to specific controls, as regulations ripple through the whole plant". The provision of emergency core cooling, a containment vessel, protection against fire, the provision of monitoring instrumentation, protection against seismic events — all had their effect on costs, he said.

A further hypothesis, he suggested, was that regulations become increasingly stringent to hold down total environmental costs. If the number of coal stations were doubled, there would be demands to halve their emissions. The same applies to nuclear power, Komanoff believes "to keep total risk constant, the probability per reactor of an accident must fall".

In both the coal and nuclear case, he calculated, station costs increased by 50% for each doubling of the corresponding sector.

Moreover, the lessons of Three Mile Island have yet to affect power station costs. "The Kemeny findings are not the end of the story. The Nuclear Regulatory Commission, and the Advisory Committee on Reactor Safeguards are constructing proposals which will lead to sweeping, thorough, and comprehensive improvements in reactor design." These alone would continue the upward trend in nuclear costs "and if a Welshman sees certain safeguards applied to a reactor in Virginia, he will want them in Wales too".

In the UK, coal station costs would also rise, thought Komanoff, because "at the moment you export all your SO₂ to Scandinavia and Germany" so there would be pressure for controls, but this would not be so strong as the purely internal pressure in the US — which has now had its major effects.

The net result, he said, was that a 1150 MW nuclear plant built in the US in 1988 would produce electricity at 4.74 cents/kWh. A 300 MW coal station built at the same date would produce electricity at 3.83 cents/kWh, allowing for interest on capital costs. The capital costs would be: nuclear, \$1684/kW; coal, \$945/kW.

But, said David Widdicombe, QC, who was chairing the Parliagaes/Green Alliance meeting, the crucial question was

whether there were reasons to expect the British experience to be different.

There were, said John Jukes of the CEBG. First, progress towards the coal production targets of the National Coal Board were slow; and coal will be needed for other purposes (such as substitute natural gas), pushing its price up. "The US has plenty of cheap coal, so relativities are bound to be different". But, said Komanoff, even a tripling of coal costs would only equalise coal and nuclear electricity prices.

Further, said Jukes, the UK has an appalling record on large construction sites and "until we get that right no-one will know the costs."

"Also the regulations in the US have been piled on one after the other in a not very efficient way." Britain should avoid a detailed licensing procedure like that in the US, said Jukes, where every component has to be certified.

"We won't know the costs until we place the orders for the next advanced gas-cooled and pressurised water reactors" said Jukes, backed up in this by a colleague Mr F P Jenkin, head of the system planning branch of the CEBG. "The CEBG has no commitment to build plant which are too expensive" said Jenkin.

However, a broad call was made at the meeting for the CEBG to expand on a term in its own costings, prepared for the meeting by Mr Jenkin, where the whole cost advantage of nuclear stations comes in a single item: 'net system savings'. (See table). This term contains most of the important assumptions, said Komanoff; will the CEBG not spell them out?

"There is a strong feeling in this meeting that more information is needed" said Widdicombe. "I will certainly accept that" said Jukes.

On the other hand David Pearce, of the Department of Political Economy,

University of Aberdeen, and a prominent critic of the Windscale inquiry into the expansion of nuclear fuel reprocessing facilities in Britain, attacked Komanoff's own assumptions. "The average load factor for a coal plant in the US is 55%, not the 72% he assumes. And I found his results are very sensitive to coals costs. If coal rose to three times uranium costs, his coal/nuclear balance would be reversed."

At the Select Committee on Energy, Komanoff was also subjected to close criticism. "If nuclear reactors are uneconomic" asked Arthur Palmer "why do the utilities continue with them?" Because, said Komanoff, they feel they are fighting a holy war. "But does that eliminate the profit motive?" asked Palmer. There is no profit motive, said Komanoff, because utilities' profits are guaranteed by state law, which guarantees an electricity rate which will cover running costs and give a return on capital investment.

Komanoff recommended that if Britain were to have an expanded nuclear power programme, it should not chose the PWR. There are more PWRs in the world than any other reactor type; "and if you leave yourself open to design reviews of PWRs the world over, you will constantly face escalating costs. On the other hand if you go for a minority reactor . . ."

"If I wanted to destroy the CEBG's nuclear programme" said Komanoff "I would recommend a large Westinghouse PWR". The average load factor of the 13 such reactors over 800 MW in the US was 44% last year. "And over 50 reactor-years the average load factor has been only 52%."

Smaller coal plants, of 200-400 MW, said Komanoff, should be able to operate at 70-75% "if the electricity supply system were properly planned".

Robert Walgate

Table: net effective costs of new stations (March 1980 prices)

	Nuclear			Coal Fired		
	(a)	(b)	(c)	(a)	(b)	(c)
Capital cost of station including initial fuel (£/kW) in the case of nuclear	850	1000	1150	416	490	564
Net effective cost (£/kWpa)						
Capital charges	71	84	97	35	41	47
Decommissioning	2	2	2	0	0	0
Other operating costs	12	12	12	10	10	10
Net system savings	-121	-121	-121	-30	-30	-30
Total	-36	-23	-10	+15	+21	+27

Notes:

- For both nuclear and coal fired stations, (a)×(c) represent -15% and +15% respectively on the central estimate of capital cost.
- Capital charges include those on associated transmission works.
- Capital charges include the annuitisation of interest during construction.
- Decommissioning costs include plant scrap value allowance.
- Other operating costs cover salaries and associated costs, repair and maintenance, rent, rates, insurance, etc.
- Net system savings are system savings after deducting station fuel cost.