



Dr Monigatti ACC Toxicology Panel Denial of Arndt Vs ACC Case for Occupational Cancer Compensation

TOXICOLOGY PANEL

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16th January 2020
Mr Sebastian Bisley
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Dear Mr Bisley

Arndt v ACC (BUD-LIVE.FID855866)

On 3rd December, 2019 ACC's Toxicology Panel reconvened to give further consideration to Mr Brian Arndt's claim for occupational cancer. Specifically, the Panel reviewed some answers by Ms O'Brien, an Australian scientist, to Mr Arndt's questions about his exposure to the lead scavengers ethylene dibromide (1,2 dibromoethane) and ethylene dichloride (1,2 dichloroethane), and other substances including benzene during his time at the Marsden Point Refinery between 1966 and 1974. Mr Arndt implicates this exposure as the cause of his prostate, breast and skin cancer.

The Panel noted that there had been two cancer studies on workers exposed to ethylene dibromide with neither reporting a statistically significant increase in cancer mortality – however, these studies were considered inadequate due to confounding factors. Several animal studies have indicated that long-term exposure to ethylene dibromide increases the incidences of a variety of tumours in rats and mice in both sexes by inhalation, gavage (being placed in the stomach) and



on application to the skin. The International Agency for Research on Cancer (IARC) found sufficient evidence for the carcinogenicity of 1,2-dibromoethane in experimental animals but inadequate evidence for carcinogenicity in humans. Their overall evaluation was that it is probably carcinogenic to humans.

The Environmental Protection Agency (EPA) uses mathematical models, based on animal studies, to estimate the probability of a person developing cancer from breathing air containing a specified concentration of a chemical. The EPA estimates that if an individual were to continuously breathe air containing ethylene dibromide at an average of $0.5 \mu\text{g}/\text{m}^3$ over his or her entire lifetime, that person would have no more than a one-in-10,000 chance of developing cancer as a direct result of breathing air containing this chemical. The Panel observed that Mr Arndt's exposure to ethylene dibromide during his eight years at Marsden Point would have been a tiny fraction of that.

In regard to ethylene dichloride, the Panel noted that epidemiological occupational studies have not been able to link exposure to ethylene dichloride specifically with excess cancer incidence. An increased incidence of colon and rectal cancer in men over 55 years of age exposed to ethylene dichloride in the drinking water has been reported but the study population was concomitantly exposed to other chemicals. Following treatment by gavage or topical application, increases in incidence of several tumour types including gastric, breast, lung and liver have been reported in rats and mice. As with ethylene dibromide, the International Agency for Research on Cancer (IARC) had found inadequate evidence for carcinogenicity of 1,2 dichloroethane in humans but sufficient evidence for carcinogenicity in experimental animals. Their overall evaluation was that ethylene dichloride was possibly carcinogenic to humans, whereas EPA classified it as a probable human carcinogen.

EPA estimated that continuously breathing air containing ethylene dichloride at an average of $4.0 \text{mg}/\text{m}^3$ over an entire lifetime would result in not greater than a one-in-10,000 increased chance of developing cancer. Again, the Panel noted that this level would far exceed anything Mr Arndt might have been exposed to at the oil refinery.

The Panel noted that benzene is a well-established cause of cancer and that the IARC has classified it as Group I (carcinogenic to humans). Benzene is known to cause acute myeloid leukaemia and there is limited evidence for causation of acute and chronic lymphocytic leukaemia, non-Hodgkin's lymphoma and multiple myeloma. It is not a recognised cause of prostate, breast or skin cancer.

Having considered Ms O'Brien's evidence the consensus of the Panel was that any distant occupational exposure Mr Arndt may have had to ethylene dibromide, ethylene dichloride, benzene or other substances was less likely than not to have caused his skin or other cancers.

J R Monigatti

Convenor