Note on the derogation on the use of asbestos in electrolysis cells

Written by the European Trade Union Institute for the European Trade Union Confederation

1. The political context to the derogation

The European Commission has had regulatory powers to ban asbestos since 1976. At that time, a number of Member States had or planned to bring in national prohibitions. Other States were against the idea. It was not until 20 years later, in July 1997, that the European Commission put an EU-wide blanket asbestos ban on the agenda. Most of the then-fifteen Member States backed the idea, but three - Spain, Greece and Portugal - were opposed. Some States - Germany in particular - called for exceptions or derogations to be attached to any prohibition. When the Technological Progress Committee (of Member State representatives) examined the Commission proposal for a directive in May 1999, Germany made its support dependent on a derogation being included to let Member States authorize the use of asbestos in electrolysis cells. The chief beneficiary of this was the chlor-alkali industry.

There was no question but that this derogation was for a transitional period. The document put forward by the Commission for the second stage of social partner consultations on the protection of workers from the risks related to exposure to asbestos at work\(^1\) is very clear on the timetable. It says, “This situation (the document refers to the increasingly reduced use of asbestos) will be remedied by 1 January 2005 at the latest, the deadline for the implementation of Commission Directive 1999/77/EC, which bans the marketing and use of chrysotile asbestos and products to which it has been deliberately added, with one exception (diaphragms used for electrolysis) until 1 January 2008”.

The conclusion therefore has to be that Directive 1999/77/EC provided a provisional derogation to avoid unnecessarily delaying the asbestos ban and to give firms that used asbestos diaphragms in electrolysis cells an extra three years over other firms that were using asbestos in different production processes.

Additionally, maintaining the derogation hampers the application of Integrated Pollution Prevention and Control Directive 96/61/EC of 24 September 1996, which requires the use of the “best available techniques” defined as “the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole”. In 2001, the Commission defined what were the best available techniques for chlor-alkali production, emphasizing that, “The selected process technology has a major impact on the energy use and emissions from the manufacture of chlor-alkali. Best available technique for the production of chlor-alkali is considered to be membrane technology. Non-asbestos diaphragm technology can also be considered as BAT”\(^2\).

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2. Economic context

The great majority of firms concerned have taken steps to modify their technology and to use electrolysis cells operating with membranes\(^3\) that contain non-hazardous substitutes. In 2004, even before Directive 1999/77/EC had entered into force, chlor-alkali production in asbestos diaphragm cells had fallen to no more than 17.4% of total EU production\(^4\). That percentage has fallen further in the past four years. Most European groups - like Rhodia, BASF, Bayer, AKZO Nobel, Arkema - do not use asbestos diaphragm technology. The Solvay Group is reportedly poised to replace asbestos diaphragms in the only factory where it still uses them (Rheinberg). Opposition to a blanket asbestos ban now seems to come only from Dow Chemicals which is against this change in Europe (the Stade factory in Germany) and the Polish manufacturer Zachem (Bydgoszcz plant).

Elsewhere in the world, asbestos is also gradually falling out of use in chlor-alkali production processes. In Saudi Arabia, asbestos diaphragms will be unlawful from 2010. The State of Rio de Janeiro in Brazil has also decided to prohibit asbestos diaphragms. All facilities in Japan now use membrane technology. In the United States, which still has many asbestos diaphragm cell plants, no new installation built since 1984 uses the technology, described as obsolete in a chemical industry reference book in 1991\(^5\).

Dow Chemicals, the main producer concerned in Europe, puts forward no technical case for its stance. In fact, it is changing the production technology at its Freeport (USA) plant and says that the change to a new membrane cell technology will make the plant more energy efficient\(^6\).

3. The Commission document

As far as can be ascertained, the DG Enterprise paper entitled “Review of the derogation on chrysotile asbestos diaphragms under Commission Directive 1999/77/EC” is the only document available in which the Commission seeks to justify its decision not to withdraw the derogation allowing Member States to authorize the use of asbestos in electrolysis installations\(^7\). The review paper was cited by Commissioner Verheugen in his reply dated 8 November 2007\(^8\) to the question tabled by Ms Kartika Liotard in the European Parliament.

The document makes a technically flimsy case. It is disturbing to find such an important decision based on such superficial evidence. Two basic arguments are advanced. One is that changing to asbestos substitutes would increase power consumption. This argument is

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\(^3\) For completeness’ sake, it bears pointing out that diaphragms can still be used, replacing the asbestos with other substances like Polyramix or Tephram. The general industry trend, however, is towards replacing diaphragm with membrane electrolysis cells.


\(^5\) *Kirk-Othmer Encyclopedia of Chemical Technology* (4th Ed. 1991, Vol. 1, p. 957): “Because of the ecological and economic advantages of the membrane process over the other systems, membrane cells are currently favored for new production facilities”

\(^6\) Dow Chemicals press release dated 29 January 2008. See [http://news.dow.com/prodbus/2008/20080129b.htm](http://news.dow.com/prodbus/2008/20080129b.htm), in particular, “The Dow Chemical Company announced today that it will break ground this year on a state-of-the-art membrane chlor-alkali production facility in Freeport, Texas. The new, more energy efficient facility is designed to provide a long-term reliable supply of chlorine to derivative products”.


refuted by the facts. Most (non-asbestos) membrane plants operate on the same voltage as those using asbestos diaphragm technology. Plants where a substitution has been made have experienced no significant increase in energy consumption per tonne produced. To the contrary, Dow Chemicals claims that substitution will be a worthwhile investment that will reduce energy consumption ... in its US facilities! The industry organization Belgochlor cites as one of the benefits of membrane technology that the process affords “low energy consumption, akin to that of diaphragm cells”.

The evidence of information collected is that all the plants - whether diaphragm or membrane cell - in practice operate on very similar voltages varying between 3.2 and 4 volts. The differences depend not on the technology used (diaphragm or membrane) but on other factors like the saturated brine concentration (usually about 300-315 g/l), temperature (normally 85°-98°) and, above all, current density. Variations in current density are not determined by the use of a particular technology. Membrane cells at Solvay’s Rheinberg facility operate at the same current density as asbestos diaphragm installations at Dow’s Stade plant. One specific feature of membrane technology is to enable lower energy consumption. Using oxygen depolarized cathodes (ODC) in chlor-alkali electrolysis can reduce cell resistance by approximately 1 volt, reflected in substantial energy savings.

The second argument is that asbestos diaphragm technology is safer because it reduces the potential risk of explosion from a reaction of chlorine with hydrogen. This holds little more credibility than the energy consumption argument. There are no such reported accidents within the past thirty years, despite the expansion in membrane technology plants in Europe. This is a surprisingly irresponsible claim by DG Enterprise, which appears to have overlooked the fact that the Commission itself identified membrane electrolysis as a best available technique for reducing the environmental risks of chlor-alkali production. Were such a solution to harbour major accident risks, it would certainly not have won a consensus among the experts consulted by DG Environment.

Even more striking than the flimsiness of DG Enterprise’s case is the extremely casual manner in which such a big decision was taken. No thorough assessment was made of national derogations. No study was done in firms that had implemented substitute technology. A derogation in Sweden for a hydrogen producer is mentioned in passing without further clarification. The health impacts were not assessed. So crucial an issue as waste treatment is not even touched on.

Directive 99/77/EC specifically provided that the derogation would be reviewed before 1 January 2008 and that the Committee on Toxicity, Ecotoxicity and the Environment would be consulted. There is no evidence of the procedure followed by DG Enterprise having fulfilled this requirement.

The European Trade Union Confederation believes that the period of adjustment provided for by Directive 1999/77/EC must now end. It calls on the Commission to comply with the criterion laid down in the Directive that the derogation must end when “suitable asbestos-free substitutes become available”. The Commission needs to give a decision on this now, and tackle the issue rationally, based on an assessment of the facts instead of simply parroting the lobbying arguments put out by firms that are not giving health and the environment the same level of protection in Europe as they do in the United States. Maintaining the derogation is a barrier to technical progress and represents a risk to the environment and human health.

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