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INDUSTRIAL CONTACT REPORT

Date: September 7th, 1972.

Visit to: CIGRE Study Committee No. 15
Working Group SC 15/WG-D5 "Askarels",
Meeting held at UNESCO, Paris.

Attended by: C.R. Coleman.

Summary and Conclusions

The principal concern of this meeting was to take action to counter an impending ban on the use of PCB's in Switzerland, expected to come into effect at the end of September 72. A sub-working group will be set up to produce a document based on the forthcoming ANSI document. However, it will appear too late to prevent the ban in Switzerland.

Prodelec introduced a new capacitor impregnant 'Chloralkylene 12'.

It was suggested that the Monsanto Company might give up PCB production.

Apparently, a market for capacitor askarel exists in Hungary.

DETAILS

A total of 29 delegates attended. The chairman (E.H. Reynolds) opened the meeting and welcomed the delegates. This was the 7th meeting.

1. The Minutes of the meeting held at Arnhem, Holland, on 2.6.71 were approved.

2. Matters Arising

Dr. Nakamura (Hitachi) wished to make a statement on behalf of Mr. Matsuo (Kanagafuchi), who was not present. He will do this later, in writing.

The Chairman said that IEC document RM 1500 TC10 'Unconfirmed Minutes of the Ljubljana Meeting 1972' should be available from National delegates.

The Chairman asked Mr. Jay if he had any details of the biodegradation of Pyralene 2000. Answer: not at present.

3. Title

The Chairman proposed to change the title of this working group from 'Askarels' to 'Dielectric Liquids other than Hydrocarbons.' Synthetic hydrocarbons would be excluded.

No objection was raised by the delegates.

4. Environmental Limitations on Use of Askarels.

Drs. Held and Praehauser called for an authoritative statement from CIGRE on the PCB situation. A document similar to that produced by NEMA covering the use and disposal of askarel should be produced.

The Chairman questioned Dr. Nakamura about the situation in Japan. His answers were somewhat indistinct. The ban is complete except for equipment which can be returned to the manufacturers after use. An example is the transformers used by National Railways who can continue to use askarel transformers until October 73. Mineral oil is now being used in capacitors and silicone oil to a limited extent. PCB is not now allowed. Dr. Nakamura was unable to say if there were any other exceptions and will notify the chairman later. (Dr. Nakamura's answers may have been different from the above, but he was not easy to follow.)

Mr. Boyer reviewed his document (15-72) WG-02 Boyer-1). The situation is now more urgent in that the law comes into effect on 30.9.72 (actual date - not a target). Swiss legislation had considered that the toxicity question was more important than the environmental question. Trichlorodiphenyl had been placed in class 1, but pentachlorodiphenyl in class 2. Dr. Knust asked if the law was available in printed form. Mr. Sohber said that the law had been framed without reference to users and without discussion within the electrical industry. Mr. Jay said Prodelec had written to Berne pointing out that, in terms of lethal dose, PCB's were 13 times less toxic than DDT. This working group should also write to Berne. The writer pointed out that the law

toxicity of PCB had led to its approval as hydraulic fluids used in coal cutting machinery in German mines. Mr. Wirsén described the situation in Sweden. Dr. Feiser said that there were no problems in Italy. There was only one producer, and he had warned users about the disposal. The Italian Electrotechnical Committee will publish a code of practice. The use in transformers was small.

Dr. Knust said that in Germany at present there was no restriction of electrical applications. The matter was under discussion with the ministries. There was a tendency to continue use in larger equipment. The 2kVAr limit, as in Sweden, may be different. The law regarding disposal may be the same as for mineral oil. They had suitable equipment for disposal. Dr. Held said that at least 2 firms should be available for destroying waste material.

Dr. Dakin reviewed the position in the USA. There were several places, other than Monsanto, St. Louis, that can incinerate PCB's, also paper and metal. The disposal of complete equipment has not yet gone far. The ANSI document was in preparation, final version expected in November. The Federal Government document issued in May reviewed the whole problem and permitted continued use in closed containers. Sanitary landfill is still used in some places for disposal of capacitors, but had been found unsatisfactory on occasions and was likely to be withdrawn. There were differences of opinion over this. The Monsanto Company might give up production of PCB's. There had been a 'hold harmless' agreement. The lawyers didn't like it but finally signed it. Alternatives to askarels are being sought. Aroclor 1016 was available for capacitors.

Mr. Jay gave the reference of the document alluded to by Dr. Dakin: US Dept. of Commerce; COM-72-10419; May 1972, "Polychlorinated Biphenyls and the Environment" - Interdepartmental Task Force on PCB's. (Washington DC).

Dr. Vermeer reviewed the situation in the Netherlands. The use was limited, there being few capacitor banks and few transformers. A law had been passed but was now being discussed. Cooperation with industry was good and a code of practice was being discussed.

Coleman read the OECD paper and distributed 12 copies.

4.5 To be discussed after item 6.

5. Toxicology

The Chairman referred to document (15-72/WG-02 Reynolds-5) "Toxicology Status of PCB's" compiled by Albert C. Kolbye, Deputy Director, Bureau of Foods and Drugs Administration.

Coleman read and distributed 12 copies of a paper by Messrs. Volden and Lidgett entitled "Biodegradation Studies of PCB's". Mr. Jay asked if figures 3 and 4 referred to pure isomers or mixtures. Coleman said that they referred to pure isomers. (This answer was wrong!).

Mr. Jay asked Dr. Nakamuta about details of a culture in Japan that is said to destroy PCB's. He couldn't remember the name. Dr. Nakamuta was unable to help.

6. Handling of (PCB's) Askarels

National delegates were asked to state the position in their respective countries regarding a code of practice.

The answers were as follows:-

France: Spent Askarel is collected from transformers and re-processed.

Sweden: Draft has been circulated: this was noted in Wirsén's write-up.

Hungary: Discussions are going on. Manufacturers hope to be able to use in capacitors (!!!). There are very few transformers. They do not yet have a code of practice.

Belgium: None

Italy: Starting now, expected to be ready by end of the year.

Switzerland: No official draft. Companies have drafted a code.

Netherlands: No draft available.

Japan: No code of practice.

Yugoslavia: No code of practice.

Germany: There exist 2 guides for the handling of PCB's but they are 10 years old: 1) for the user and 2) for the manufacturer. They cover both health hazards and environmental problems. They are now being improved.

U.K.: No official code of practice. Only 1 manufacturer who has privately notified customers of necessary precautions.

The discussion returned to item 4.5 of the agenda "To attempt to formulate a view on the likely continuing availability and approval of PCB's in heavy electrical equipment."

Dr. Held expressed the view that CIGRE should issue a declaration to ensure the continued use of askarels. Dr. Vermeer agreed. Dr. Dakin suggested that the ANSI document could be used as a basis.

The Chairman prevailed upon Mr. Jay to lead a sub-working group to prepare this document. Those selected were:- Dr. Knust, Mr. Boyer, Mr. Volden (if available), Mr. Bozzini, Dr. Müller, Dr. Fournié.

Dr. Held suggested that the document should be sent to the highest official authority in each country. Mr. Peiser thought it better to deal via the National Committees of IEC or ISO. Dr. Dakin said he would like to comment on the final draft. Dr. Praehauser said that the document should not contradict any national laws. Dr. Held considered that it should merely answer the questions:- 1) What is PCB, and 2) its toxicity. The Chairman said it should be a scientific document and technologically sound. There was no need to publish it in Elektra for the moment. Dr. Held suggested the title 'Askarels, their properties and handling in electrical equipment.'

Further matters were to be left to the sub-working group to decide.

7. Substitutes for askarels

Mr. Jay questioned the value of the resistivity of transformer askarel given in the chairman's paper (document 15-71/WG-02 Reynolds-1).

Mr. Boyer mentioned having carried out tests with silicone oil. Mr. Schober wondered if askarels will increase in price to take care of disposal arrangements. Drs. Knust and Held questioned the toxicity of the new materials. The Chairman pointed out that Du Pont's Freon was now cheaper than trichloroethylene. Dr. Dakin said that higher temperatures in transformers were not required so long as cellulosic insulation continued to be used.

Mr. Jay read a document 15-72(WG-02)-Jay 1 entitled 'Substitute impregnant for capacitor askarel - Chloralkylene 12'. (Dr. Held pointed out that the tables on pages 10 & 11 were too high by a factor of 10). Mr. Jay said it had been produced for mixed dielectric capacitors and not for environmental reasons. He answered further questions about its flammability (Gros Lambert) and its viscosity and his experimental capacitor test (Boyer). He told the chairman that large samples are now available and it will be available on an industrial scale at the end of the year. Dr. Dakin suggested that governmental agencies should be approached regarding its classification as a PCB or otherwise. Mr. Jay asked Dr. Nakamura if it was likely to be allowed into Japan. The reply was that it was a question of toxicity. Mr. Jay said that the LD50 for Chloralkylene 12 is 3000 mg/kg compared with 2000 mg/kg for trichlorodiphenyl; not a significant difference.

Time prevented further discussion.

8. Purification of dielectric liquids by electro dialysis

The Chairman asked that the last paragraph of his document 15-72/WG-02 Reynolds-6 should be deleted since an internal memo had been circulated in error. No discourtesy to these workers had been intended.

Mr. Jay drew attention to the work of Felici and his school at Grenoble. With askarels these methods had not given superior results to those obtained by conventional earth treatment. One reason was that the viscosity was too high and therefore the ion mobility too low. With new membranes, moreover, there was more adsorption than extraction, and the level of purification was not maintained. Experiments with coloured liquids had shown this.

9. Measurements

The Chairman said that Dr. Flessner of BICC had read the document produced by Mr. Serena (IEC 10 (Secretariat)) and agreed with it entirely. He drew attention to a report dated 26th Aug. 1971 by Glen O'neal Jr. of the FMC Corporation, on a new design of cell for thin films.

There was no interest in reopening a discussion on the relation between tangent delta and resistivity measurements. It was considered that this had been adequately covered in the past by the late Mr. Coquillon.

10. Dublin Conference on Dielectrics

Mr. Krasucki read his report (document 15-72(WG-02)Krasucki-2). He apologized for inserting his own interpretation of the experiments of Matuszewski, et al of Gdansk. The conference proceedings will be published and copies will be available from Dr. T.J. Gallagher of Dublin University.

11. Liquified Gases

The Chairman presented his bibliography (15-72/WG-02 Reynolds-7). He said that the ambit of the working group could be extended to cover this topic if members so wished.

There was insufficient time for further discussion.

12. Other business

None.

13. Next Meeting

Probably in London during September 1973.

Colin R. Coleman.

C.R. COLEMAN

CRC/HR
26.9.72