

The Story of ICEFA

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Introduction

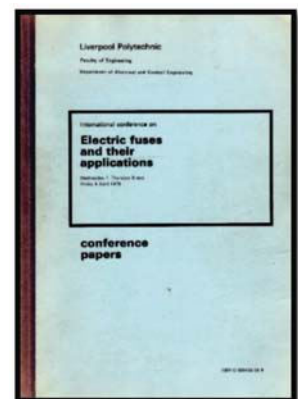
In the late 1960s I was a lecturer in power engineering in Manchester, when I was approached by Peter McEwan, a postgraduate student. He was employed by English Electric Ltd, a well-known manufacturer of fuses, and wanted to do a project connected with his work. I had an interest in heat transfer, so agreed to help, although I had very little understanding of fuses and how they worked. I probably shared the common view that there was little of technical interest – surely a fuse was "just a bit of wire".

Over the next few years I became increasingly interested, realising that there was much work to be done in this field, and that it was truly multidisciplinary. To understand the design, testing and application of fuses a knowledge of electrical circuits, electromagnetics, heat transfer, materials science and technology, mechanical engineering, and plasma physics was required. In addition, problems needed to be solved using numerical methods, so the *methods* of solution were also important.

There was very little help to be found in the published literature, so I thought it would be useful to bring together people whose names I had discovered while working in the library, by organising an International Conference.

Liverpool, UK 1976

One name that kept turning up in the literature was that of Prof. Tadeusz Lipski, who led a group of researchers working at the Technical University of Gdansk in Poland. Peter McEwan made a trip to Gdansk and asked Prof. Lipski if he would be prepared to give the opening address at a conference on fuses. Lipski accepted, and then I began the organisation of the first International Conference on Electric Fuses and their Applications, which was held at Liverpool Polytechnic on April 7th-9th 1976.



The conference attracted 35 papers from 20 different countries and included keynote addresses from the following speakers:

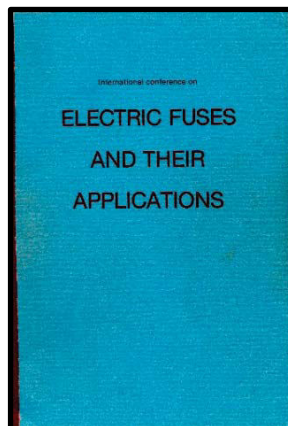
Tadeusz Lipski (Technical University of Gdansk)
Jack Feenan (GEC English Electric Fusegear, UK)
Henry Turner (Electrical Research Association, UK)

Most of the world's leading experts of the time were there, and these people formed the core for future conferences. I discovered that a few years earlier that Henry Turner and Tadeusz Lipski had formed an informal group called the Fuse Club, whose object was "to collect and exchange published and unpublished information in the field of electric fuses" between people who were interested in advancing our understanding of fuses. In those days before widespread travel and the internet, such exchanges were slow and difficult.

The Fuse Club is still in existence, with myself as Chairman and Dr. John Leach as Secretary. John was one of those present at the 1976 conference, where he presented a paper on the application of fuses for semiconductor protection. In the world of today exchanges of information are simple. The main role for the Fuse Club nowadays is to find volunteers to host the next conference.

Trondheim, Norway 1984

After the success of the International Conference on Electric Fuses and their Applications in 1976, several people asked me whether I could organise a second conference a few years later, but the organisation of the first conference had taken so much of my time that I was not able to do so. It appeared that there would not be a second conference. That it continues to exist is due to the energy and persuasive powers of Tadeusz Lipski. One summer he was on a cycling holiday in Norway, when he visited Dr John Kulsetas and persuaded John to organise the second International Conference on Electric Fuses and their Applications, which was held there on June 13th-15th 1984 at the Norwegian Institute of Technology, Trondheim, in collaboration with the Technical University of Norway.



Prof. T. Lipski

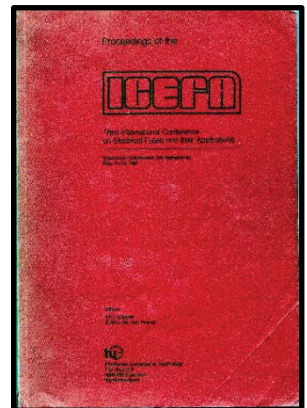
There were 29 papers and again the conference was opened by Prof. Lipski. His enthusiasm for the subject was limitless, and whenever he was present at a meeting there was no possibility of it being dull (or finishing early!).



Trondheim 1984. John Kulsetas is on the first row, on the left

Eindhoven, Netherlands 1987

At Trondheim it was agreed that the next conference would be held in the Netherlands, thanks to the efforts of Dr. Leen Vermij. Indeed after that we have always managed to find a volunteer institution to host the next conference. (In some years there has only been one offer, but sometimes there have been more than one, and the decision on the venue for the next conference has been made by a vote of Fuse Club members at the end of a conference).



The conference was organised by Prof. Willem van den Heuvel and his team from the Technical University of Eindhoven and featured opening and closing addresses by Dr. Clara Turner and Dr. Leen Vermij. There were 31 papers, with strong interest being shown in *miniature fuses*. This was the first time that the full name of the conference was contracted to become ICEFA.

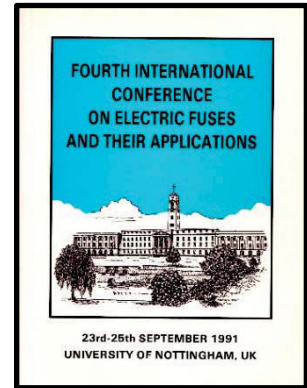


Eindhoven 1987. Clara Turner and Leen Vermij are seated in the middle of the second row

Nottingham, UK, 1991

Since 1987 ICEFA has been held regularly, every 4 years, and the next conference was held in at the University of Nottingham, UK from 23rd-25th September. The organisers were Dr. Alan Howe and Prof. Arthur Wright, with the support of Brush Fusegear Ltd. The opening address was given by Jack Feenan, and there was a large increase in the number of papers (50), which were of a very high technical standard.

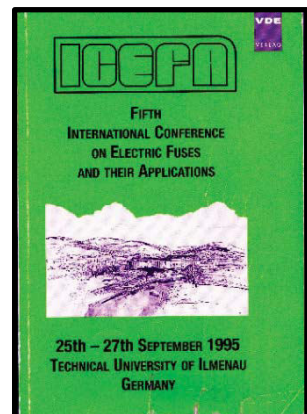
There was also an excellent social programme for delegates and their partners, which set a standard for following conferences. This was the first time that ICEFA was held in September. All the following ICEFAs were held in this month, which seems to be the most convenient.



Ilmenau, Germany, 1995

ICEFA was held in Germany for the first time in 1995. There were 40 papers, and the conference organiser was Dr. Gabrielle Nutsch and Prof. Wolfgang Rother in the Department of Electrical Engineering and Information Technology at the Technical University of Ilmenau from 23rd-27th September.

The keynote address was given by Prof. Manfred Lindmayer, on the subject of current limitation by superconductors and conducting polymers. There are polymer products available for low-voltage low-power applications, but as far as I am aware there are still problems to be solved for practical application in high power systems.

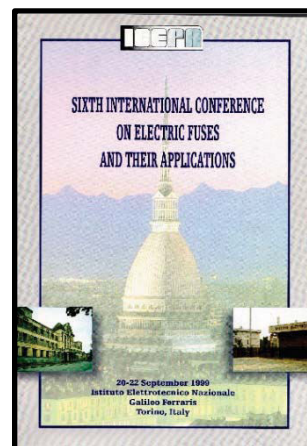


Turin, Italy, 1999

In 1999 ICEFA was held at the Istituto Elettrotecnico Nazionale Galileo Ferraris in Turin Italy from September 20th-22nd. For many years there had been a research group there, and the conference was organised by Dr. Giovanni Farina from that group.

This was the largest of all the ICEFA conferences, with 58 papers, and an opening lecture was given by Prof. Andrew Wolny from Gdansk, Poland, on "what fuses can offer for the next century".

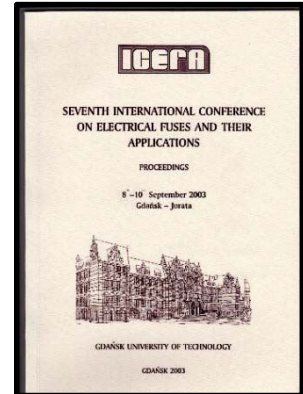
One example of what fuses can offer was provided by Vincent Saporita whose paper showed how current-limiting fuses were very effective in reducing arc flash hazards, a topic which had just begun to assume great importance, and still does. Vincent was awarded a prize for best paper at the conference.



Gdansk, Poland, 2003

In 1999 ICEFA was organised by Prof. Andrew Wolny of the Technical University of Gdansk, where so much work on fuses had been done previously. Tadeusz Lipski would have loved to be there, but unfortunately it was not to be, as he died in 2001.

After the conference opening in Gdansk, delegates went by boat to Jurata on the beautiful Hel peninsula, where the sessions were held. The conference attracted 34 papers, and began with a keynote lecture from Dr. Herbert Bessei on "The Future of Fuses". Also of note was an invited contribution from Gordon Newbery on International Standards. The conference was held in early September, from 8th-10th.



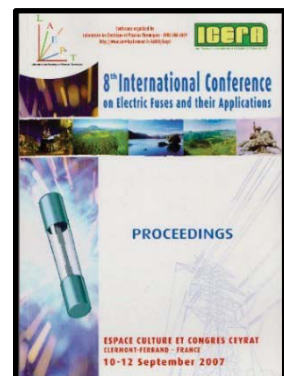
A paper from Tony Stokes and David Sweeting on arcing burn hazards was a landmark in the field of arc flash studies, while fundamental research presented by William Bussiere and David Rochette gained them the award for the best paper.

Clermont-Ferrand, France, 2007

Bussiere and Rochette and their colleagues at Blaise Pascal University organised the next ICEFA which was held in 2007 in Clermont-Ferrand, France, from September 10th-12th. There were a large number of sponsors and associated societies.

The introductory lecture was given by Dr. Jean-Louis Gelet, on "The Origins of Fuses".

There were only 23 papers, most of them of an academic nature. This was a cause for some concern for John Leach and myself, and we wondered what the future held for ICEFA.

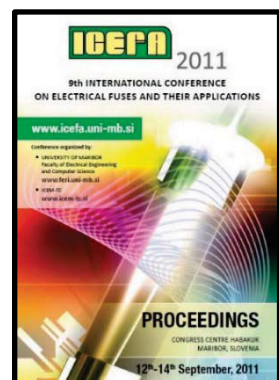


Maribor, Slovenia, 2011

Dealing with our concerns was a key challenge for the organisers of ICEFA 2011, and they rose very well to that challenge. It was very pleasing that the number of papers presented at Maribor increased to 26, but more importantly the percentage of papers from industrial sources rose, to almost 70%.

The conference was organised by Prof. Jože Pihler of the University of Maribor and Mitja Koprivšek from ETI.

The opening lecture was given by Dr. John Leach on the subject of "Standardisation and Electrical Safety". Mitja Koprivšek and I also gave review lectures, on varistor fuse technology, and fuse modelling methods.



Dresden 2015 and the future

The number of papers presented at the conferences over the years is illustrated in the graph.

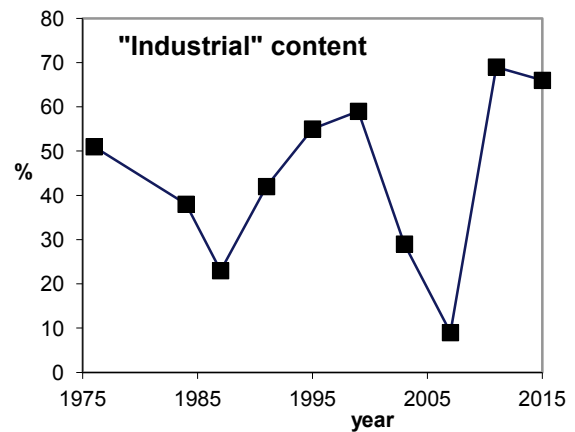
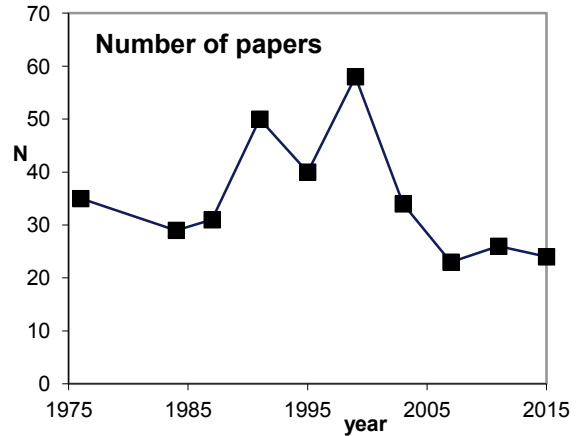
The figure for Dresden 2015 is based on the papers accepted at the time of writing, and the final number may differ from this. Nevertheless, the number of papers for the three most recent conferences has been around 25, which is sufficient for a viable conference.

Here we can see the percentage of papers which were of an "industrial" nature (i.e. not from a university or research association).

Following a dramatic reduction from 59% in 1999 to 9% in 2007, the situation changed. A deeper study shows that the type of contribution is also changing, with more emphasis on topics such as environmental issues, protection of renewable systems, electric vehicles, and smart grids.

Another key reason for the changes in the nature of ICEFA is that the number of fuse manufacturers in the world has fallen dramatically over the past twenty years, due to takeovers, mergers and globalisation. The very large companies produced by these processes tend to be dominated by non-technical people and have had their technical functions reduced and concentrated in one or two centres. The companies and research groups which contributed so much to the early ICEFA conference do not exist anymore.

Since its inception the ICEFA conferences have been responsible for the publication of 300 papers, which represents a very important knowledge base for the subject, and more than 20 will be added at Dresden. But despite all the good work that has been done, ignorance and misunderstandings about fuses are as great as ever. There is still work to be done.



Acknowledgements

My special thanks are to Dr. John Leach for his support of the conferences from the very beginning, and also for his work for the Fuse Club.

Thanks are also due to all the individuals and organisations who have given their time over the past 40 years organising the ICEFA conferences. It has been impossible to name them all in this short review.

Over the years many friendships have been made. Many of those friends are no longer with us, but they remain in our thoughts.

A watercolour by Toshiko Arai, widow of Dr. Sataoko Arai, who presented key papers to these conferences.



Conference: 10th International Conference on Electric Fuses and their Applications

Organized by: Dresden University of Technology
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