

19th International Wroclaw Symposium and Exhibition on EMC, June 11-13, 2008

By Elya B. Joffe, President, IEEE EMC Society

Welcome (Back) to Wroclaw!

Returning to Wroclaw (pronounced vrôt'sláf) was like returning home in many ways. Only persons who had previously attended the Wroclaw EMC Symposium and Exhibition, the oldest Symposium in Europe, would really know what I am talking about. The Wroclaw Symposium has always been a "family like" Symposium. It was a "get together" of regular colleagues and friends from around the globe, particularly from Eastern Europe, but in total from over 21 countries globally.

PHOTOS COURTESY OF VLADIMIR MORDACHEV, BELARUS



"Like a Family Reunion" From the left: Elya Joffe, Vladimir Mordachev and Kimball Williams

The first thing that strikes you (if you were in Wroclaw before) is the great changes the city has undergone in the last four years (I attended the Symposium in 2004 but missed the 2006 Symposium). The city blends now old and new, a historical city square with modern freeways now surrounding the city.

The City Center itself is a beautiful square, surrounded by brightly colored buildings. Its central focus is the Town Hall built during the 14th and 16th centuries. As can be seen in the photos below, some "little guys" (gnomes) were also hitching for a ride in certain corners.

I arrived in Wroclaw on June 10 in the afternoon, and was joined by Kimball Williams, Past President of the EMC Society and Dr. John Norgard, Vice-President for Technical Services, who arrived the following day, together forming a delegation of the Board of Directors of the EMC Society. The Board has been honored to be associated with this high-quality Symposium as technical co-sponsors as traditionally done for many years.

PHOTOS COURTESY OF BARBARA AND BILL LUTHER, USA



City Centre, Wroclaw Poland



Wroclaw, the "City of Gnomes"

Symposium Opening

The Symposium commenced with an opening ceremony on June 11 in the beautiful conference center in the Wroclaw University of Technology. Professor Tadeusz W. Wieckowski, Symposium Chairman, opened the Symposium with a short briefing of the history of the Symposium and its future:

"When, 36 years ago, a few enthusiasts from the Wroclaw University of Technology and the National Institute of Telecommunications (Wroclaw Branch) came up with the idea of the EMC Symposium, we did not have the slightest notion if it would work. It was era of a cold war and the so called "iron curtain" divided the world into deeply different two parts. In the divided Europe there was no common event organized on a regular basis..."

"...Our Symposium will celebrate its 20th edition in a quite new environment. In 2010, the Wroclaw EMC Symposium and EMC Europe will be organized in Wroclaw jointly, forming the biggest EMC conference in the European Community."

This was indeed a moment for a tear or two in the eyes (I know I shed a couple), this being a point in the history of the EMC Community, no more, no less, globalization (of the EMC community) in practice. The recognition that now, with the fall of the "iron curtain" and full cooperation between east and west, the need for a separate Symposium is over and "it is time to go on."

The program of this event reflects the steadily growing importance of electromagnetic compatibility. In the face of electronics penetrating almost every aspect of our life, it is imperative to create a compatible environment and it is hard even to imagine an incompatible situation which would lead to a halt in our development.

Some Stats

Some interesting statistics were provided by the Symposium Organizing Committee:

- **Papers:** 90 papers were submitted, of which 86 were accepted (many of which were invited, and underwent a special review process). 85 papers were printed and 78 were presented.
- **Sessions:** There were three plenary sessions, 22 regular sessions, two workshops and two company presentations. It is noteworthy that in the International Telecommunication Union (ITU)-sponsored sessions, 11 papers were also presented. Three sessions were held simultaneously.
- **Authors:** Authors came from 21 countries.

The Technical Program

The technical program of the Wroclaw Symposium has always been unique. As a result of the special blend between east and west, the Wroclaw Symposium became a platform for reporting developments in research of earth natural electromagnetic phenomena, spectrum engineering, management and monitoring, EMC measurements, antenna theory and wave propagation, EMC in power and railway systems, biological hazards of

electromagnetic fields and high power electromagnetic effects, natural and man-made alike, as well as the “traditional” topics in EMC design.

Of particular interest was the series of sessions sponsored by the ITU on spectrum engineering and management. These topics, particularly that of spectrum engineering and management, have for (too) long been omitted from the IEEE EMC Symposia and the Wroclaw Symposium has become their natural home.

The Technical Exhibition

In addition to the technical sessions, a technical exhibition was held, with 12 exhibitors participating. The EMC Society was also provided a membership booth, which was used both to promote membership in the Society as well as for promoting the 2008 IEEE International Symposium on EMC. Many thanks are due to Kimball and John for manning the booth throughout the days of the Symposium.

Polish Chapter Meeting

The Symposium provided an excellent opportunity to hold a meeting of the Polish Chapter, which took place on June 12, at the University. In the meeting, chaired by the Chapter Chair, Professor Karol Aniserowicz, Elya Joffe, President of the EMC Society, was invited to make a presentation on the State of the EMC Society. Another presentation was made on EMC and magnetic problems associated with electrical power meters.

After the formal portion of the meeting, a visit was arranged to the top-quality and well-equipped EMC Test Facility, which was also accredited by the Polish Authorities. The facility included a reverberating chamber as well as “conventional” test chambers. We were also lucky to be able to observe (and hopefully not interfere too much) with a test in progress, carried out by one of the students for his thesis.

We were told that on the same site a large EMC test facility will be built in the coming months, which is to support both testing but primarily the large interest in EMC in the local engineering community.



Elya Joffe presenting the “State of the EMC Society” at the Chapter meeting.

Social Events

“All work and no play make Jack a dull boy.” The Symposium offered two social events, a welcome party in the Mini-Brewery SPIZ in the City Center on June 11, and the traditional Symposium picnic on June 12. The latter was held in the Wroclaw Zoo, and included a free self-guided tour of the zoo itself.



M. Zielenkiewicz, E.B. Joffe, K. Aniserowicz, and J. Norgard (from left) visited the EMC test facility and reverberation chamber at the University.



Elya B. Joffe, Bill Luther, Kimball Williams, and John Norgard (from left) paused for a group photo on the way back from the brewery.



Elya Joffe (top) and Gennadij G. Chavka at the picnic.



The Wroclaw Zoo provided a wonderful setting for the traditional Symposium picnic.

In addition to the great food, the wonderful hospitality and the excellent music, those who wanted to also had the opportunity to dance to live music.

Summary

Attending the Wroclaw Symposium was truly a unique and remarkable experience, and for me, who attended several of the editions (2000, 2002, 2004 and 2008) each of them was truly a “Family Reunion.”

Now the Symposium is going on a new road, and from 2010 it will be held jointly with EMC Europe. In fact, in 2010, it will be meeting again in Wroclaw, as a type of a farewell and tribute to 40 years of being the oldest European EMC Symposium.

Hopefully, with the change in organization the spirit of Wroclaw will remain and that the joint Symposium will carry on attracting and serving as a meeting place for all engineers and scientists in the field of EMC and related disciplines, particularly since for the past 36 years, the Symposium was able to develop a unique program, a “regular” group of attendees and a wonderful spirit of hospitality.

The Wroclaw Symposium provided an excellent opportunity to meet and engage with our fellow Society members in Eastern Europe. The Symposium, the city, and the people made it a memorable experience, one that I hope to repeat. I can't wait to return in 2010 and wish the joint Symposium many, many years of cooperation, blending east and west.

International Wroclaw Symposium on Electromagnetic Compatibility:

Origin and Early Years

Short Notes by R. Professor Struzak (LF) and W. Professor Moron (LSM)

The origins of the International Wroclaw Symposium on EMC go back to early 1970. The conference was originally proposed by Jan Holownia, an assistant professor at the Wroclaw University of Technology, as a biannual national event with a few guests invited from abroad. The first Symposium, held from 14 to 16 September 1972, was organized under Holownia's leadership by a group of a few didactic workers from the University and researchers from the Wroclaw Branch of the National Research Institute of Telecommunications, EMC Laboratory headed at that time by Ryszard Professor Struzak. The group was composed of six people: Tadeusz Babij, Romuald Nowicki, and Ryszard Zarko from the University as well as Wladyslaw Moron, Wlodzimierz Stawski, and Ryszard Professor Struzak from the Institute.



Jan Holownia, initiator and Chair of the first Wroclaw EMC Symposium in 1972.

From this group, only Professor Moron and Professor Struzak have continued their active involvement with the Symposium until 2000, and later in honorary functions. Others changed interest in the meantime, or passed away. It is thus natural that Karol Anisierowicz, IEEE EMC-S Chapter Chair, asked the two veterans to write a few lines about the conference that (surprisingly) survived thirty-five years, and especially about its beginning that only a few people recall.

After the 1972 Symposium, Professor Moron and Professor Struzak pressed to make the Wroclaw EMC Symposium international as both gathered first-hand experience in successful international collaboration on technical matters and felt that internationalization of the Wroclaw Symposium would be beneficial to all. Professor Struzak participated in an international standardization project initiated by Tom Dvorak (then at VUS – the Czechoslovak Telecommunication Research Institute in Prague) and was actively involved in the CISPR, CCIR, and URSI studies. Professor Moron had a similar experience being for some years delegated to the COMECON International Standardization Institute in Moscow where he continued standardization work initiated by Tom, and successfully began to introduce CISPR and IEC EMC standards in the eastern block.

Holownia was not convinced that the Symposium should be internationalized, notwithstanding that in the US the EMC concept was already established at that time, and EMC conferences were regularly being held there. One should remember that in Europe, divided by the cold-war iron curtain, there was no such event organized on a regular basis. With time, however, the idea of organizing an international conference in Wroclaw found wide appreciation, creating an international fraternity interested in the development of the art and science of EMC.

The first opportunity to discuss the matter in Europe was the Zurich EMC Symposium organized for the first time in 1975 by Tom Dvorak three years after the first Wroclaw Symposium. Earlier, Tom left Czechoslovakia illegally to find refuge in Switzerland. Dvorak was supportive of the Wroclaw initiative but could not come to Poland because of political reasons. To avoid collision with the Polish Symposium and to continue working and friendly contacts, he chose the year 1975 for his gathering. Consequently, Dvorak invited Professor Moron to the first Symposium Council and Professor Struzak to the first Scientific Program Committee of the Zurich EMC Symposium (that in fact was convened in Montreux). Both participated in the 1975 Symposium and Professor Struzak's paper “EMC – Urban EM Environment: Facts, Models, Trends” won a special award citation and a monetary prize there.

Tom Dvorak's friendship facilitated collaboration. The first thing was to agree upon timing and we fixed the dates of the Wroclaw EMC Symposium in even years and the Zurich EMC Symposium in odd years. More difficult was the issue of program coordination and personal trust was decisive here, as usual. In 1975, Professor Frans Stumpers from the Netherlands chaired the scientific program committee of the Swiss Symposium. Earlier, he was the CISPR President and Professor Struzak had contributed significantly to CISPR work under his presidency. It was thus with no surprise that Stumpers supported the concept of the closest collaboration of both symposia, up to having a common program committee and proceedings format. To implement this idea, consultations with the Association of Pol-

ish Electrical Engineers SEP – the Symposium sponsor – and talks with Stumpers were needed. In his visit to Stumper's home in Eindhoven, Professor Struzak was thus accompanied by Jan Grzybowski, then the SEP Secretary. Stumpers supported the concept of one program committee for both symposia and gladly accepted the chairmanship of the common body. Later, unfortunately, various non-technical obstacles appeared one after another on both sides and the idea of one common program committee could never be fully implemented.

Hectic preparations took place in Poland in 1975, spiritus movens of which was Moron, Organizing Chairman of the 1976 conference, and all following ones up to 2000. As a result, since 1976, the name of Wroclaw Symposium has included the word "international". Its structure has been made close to that of the Zurich Symposium, with involvement of a number of persons as officers in both events. The 1976 Wroclaw Symposium Council was chaired by Professor Wilhelm Rotkiewicz, with two vice-chairs, Professors Fred Borgnis (Chairman of the Zurich Symposium) and V. Migulin (member of the USSR Academy of Sciences). Frans Stumpers chaired the Scientific Program Committee with Richard Kirby and Ryszard Professor Struzak as Vice-Chairmen. The Symposium became truly international, with English and Russian as its official languages (the Zurich Symposium has been in English only). Papers were accepted and printed in English or Russian with the summary in the second language. During sessions, simultaneous interpretation was offered in both languages with additional translation to Polish. This was possible thanks to the USSR Ministry of Telecommunications being kind enough to lend, on very favourable conditions, a team of professional simultaneous interpreters. Such a situation lasted until 1990. Several Symposia were convened in English only.



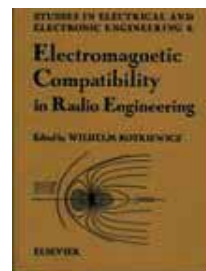
EMC Wroclaw 1978 Richard Kirby, Wladyslaw Professor Moron and Ryszard Professor Struzak discussing program issues (from left).

The Symposium could not be created, exist, and develop without the support of numerous individuals and organizations. In Poland, the backing of the Association of Polish Electrical Engineers (SEP), the Polish Academy of Sciences, and the Ministry of Telecommunications was crucial. As usual, behind organizational facades were committed people. Tadeusz Dryzek, President of SEP (and former V-Minister of the Interior) played a decisive role at the time of Symposium's inception. The Wroclaw Symposium owes a great deal to a number of ministers

beginning with Professor Edward Kowalczyk, minister in 1976. From the Polish Academy of Sciences, Professor Adam Smolinski, member of the Symposium council (1976-1988) supported the event for many years. It is worth noting that Smolinski organized the Polish Section of the IEEE in 1972, and a formal cooperation agreement between SEP and the IEEE was signed in 1973.



EMC Wroclaw 1976 Wilhelm Rotkiewicz, Chair of the Symposium Council from 1976 to 1982.



The first Polish (and one of the first in the world) book on EMC, published at the opening of EMC 1978. Its English version (above) appeared at EMC Wroclaw 1982.

Professor Wilhelm Rotkiewicz, Chairman of the Symposium Council from 1976 to 1982, deserves special mention. He initiated at the Wroclaw University of Technology studies on radio frequency interference in Poland, and most of the first-generation EMC engineers in this country (including Holownia, Professor Moron and Professor Struzak) are his former students. Rotkiewicz was also the founder and the first head of the EMC Laboratory at the Polish National Telecommunication Research Institute, Wroclaw Branch, and created what has been known later as the "Wroclaw School on EMC". The first Polish book on EMC (and one of the first in the world) was written under his leadership, and most chapters were written by his collaborators – the Symposium organizers. The book, published just before the opening of EMC Wroclaw 1978, enjoyed favorable reviews, was translated into English, and published by Elsevier under the title "Electromagnetic Compatibility in Radio Engineer-



EMC Wroclaw 2000 - Elya Joffe (left) at the IEEE EMC Society membership table.

ing". The English version appeared at EMC Wroclaw 1982.

From abroad, the support offered by the IEEE EMC Society, CISPR, URSI and ITU-CCIR was instrumental in the success of the Symposium. The IEEE EMC Society disseminated information about the Wroclaw event and encouraged its members to participate. Its presidents and officers attended the Symposium, and the Society's membership booth was present in Wroclaw on many occasions. As a visible outcome of that collaboration, a number of engineers joined the IEEE and created the Polish Chapter of IEEE EMC Society.

Liaison with CISPR goes back to the very first 1972 event, when Jean Meyer de Stadelhofen, inventor of the MDS method of measuring radio interference power, and future president of CISPR, was among the Symposium guests. URSI offered financial support for young scientists' participation, and its support culminated with the involvement of Professor Frans Luis H M Stumpers, Honorary President of URSI and our Program Committee Chair from 1976 to 1996. Stumpers also played a crucial role in coordination with EMC initiatives in Western Europe and contributed significantly to the prestige of the Wroclaw Symposium. In appreciation of his contribution, the Wroclaw University of Technology awarded him an honorary doctorate in 1992. It is worth noting that during these years, his working contacts transformed into friendship with the many Symposium participants which lasted until his final days.



EMC Wroclaw 1992 - Honorary Ph.D. Ceremony of Professor Frans Stumpers (shown at left).

URSI involvement provided the invaluable opportunity to spread the awareness of EMC issues in academic circles. So, indirectly, the Wroclaw Symposium contributed to the inclusion of EMC and spectrum management problems in URSI studies. As a result, the URSI General Assembly in 1984 created a working group on RF spectrum utilization and management and Professor Struzak became its first co-chairman.

The CCIR support materialized through the activities of Richard (Dick) Kirby, CCIR Director, and Jerzy Rutkowski, CCIR senior officer, whose interests in radio interference and

IEEE members have always attended and been associated with the Wroclaw EMC Symposium. IEEE members have served the Symposium as chairpersons of its organizing committees. For several years, Struzak (LF) and Moron (LSM) have been supported by a bit younger generation represented by Karwowski (SM), Wieckowski (SM), and Zielinski (M). The role of the Symposium in facilitating the establishment of the IEEE EMC community in Poland would be difficult to overvalue. Involvement in the Symposium gave rise to establishing the IEEE EMC Society Polish Chapter that was founded by Karwowski in 2005. The two last editions (in 2006 and 2008) of the Wroclaw Symposium have been technically co-sponsored by this new organizational unit.

spectrum management contributed to the success of the Wroclaw Symposium. Dick persistently supported the Symposium, independently of the political barriers between West and East in those times. For his contribution, he was awarded one of the highest Polish National Distinctions in 1992.

On the basis of these contacts, and making use of the special position of the Wroclaw Symposium between the East and West, the International Telecommunication Union (ITU) convened its two important events in Poland in conjunction with the EMC Wroclaw 1994 Symposium. These were the ITU-VGE Information Meeting on Proposed Simplification of Radio Regulations and the ITU Regional Seminar on Developments in Spectrum Management.

The Wroclaw Symposium has been a common endeavor of many individuals, too many to list all of them here. Carl Baum (USA), K. Bullough (UK), J.S. Chang (Canada), Henryk Cichon (Poland), Jasper Goedbloed (the Netherlands), Georges Goldberg (Switzerland), Alexander Gromov (USSR), Masashi Hayakawa (Japan), Michel Ianoz (Switzerland), Hiroshi Kikuchi (Japan), Herbert Lorke (Germany) Robert Mayher (USA), David Middleton (USA), Alexander Pavliouk (USSR), Ralph Showers (USA), Don Spaulding (USA), Titus Spoelstra (the Netherlands), T. Takagi (Japan), Valery Timofeev (USSR), and Takeo Yoshino (Japan) are only a few of the many meritorious names that ensured its excellent reputation.



EMC Wroclaw 1992 – F. Stumpers, A. Pavliouk, R. Kirby, R. Mayher, J. Rutkowski, and H. Kikuchi (from left) were honored at the occasion of the 20th anniversary of the Symposium.

Acknowledgment should also go to the colleagues from the National Institute of Telecommunications, Wroclaw Branch, who were responsible for all preparatory work and keeping data



EMC Wroclaw 2000 – W. Moron, R. Professor Struzak, D. Bem, T. Spoelstra, G. Goldberg, M. Ianoz, H. Kikuchi, M. Hayakawa, and T. Yoshino (from left) were recognized as the Symposium's most meritorious participants.

bases, to the colleagues from the Wroclaw University of Technology and to the team of the ORBIS Congress Bureau. Without their imagination and invaluable hard work behind the scenes, the Symposium would not be possible.

From the very beginning, the Wroclaw Symposium offered various social activities, including get-together cocktail parties, excursions, picnics and artistic performances.

We always tried to bring together individuals interested in various aspects of EMC, theory and practical applications, to enable their interaction in the belief that new ideas often sparkle on the borders of different fields of activity. As a result, Wroclaw became a meeting place of people involved in research of natural EM phenomena; people working in spectrum engineering, management and monitoring; radio astronomers fighting for a clear spectrum for their observations, people involved in researching of various aspects of EMC proper; people working in wave propagation and antennas; people involved in counteracting EM terrorism. It worked and people were supportive to such a wide range of topics that resulted in



EMC Wroclaw 1994 - Wladyslaw Professor Moron (left) and Carl Baum rest during a very hot day.



EMC Wroclaw 1994 - Artists' performance at the Symposium picnic.

more than 10,000 pages published through the year 2000.

The years that have passed since the inception of the Symposium witnessed many changes. About fifteen generations of electronic technologies appeared, according to Moore's Law. Thirty generations of engineers left universities to start professional careers. The iron curtain disappeared. The European Union was born and grew. EMC problems did not cease, however. On the contrary, they became much more pervasive.

Contributed by Andrzej Karwowski, founder and first chairman of the Polish IEEE EMC Chapter, and Technical Program Chair for the 2008 Wroclaw EMC Symposium. EMC



The beautiful scenery in the old city of Wroclaw, Poland.

PHOTO BY FRANZ SCHLAGENHAUFER