

MIL-STD-461 REVISION COMMITTEE

A Tri-Service Committee has been formed to revise and to update MIL-STD-461, 462 and 463. The Technical Working Group is chaired by the Navy; and key representatives from the Army, Navy, and Air Force have been designated as members. Membership has been limited to assure an efficient, productive group.

Representatives from industry and professional groups were invited to attend the April 15, 1989 meeting of this Technical Working Group. The following representatives were present:

| ANSI | Dr. Ralph Showers | | | | | |
|-------------|-------------------|-----|--------|--|--|--|
| IEEE, EMC-S | Donald Heirman | and | Edward | | | |
| | Bronaugh | | | | | |
| SAE, AE-4 | Gerald Rothhammer | | | | | |
| EIA, G-46 | Arthur Haskins | | | | | |

Each invited representative was given the opportunity to present his organization's position and to relate activities pertinent to the update of MIL-STD-461/2/3. The Government agreed to keep industry informed of its activities and to consider industry inputs relevant to the revision of the standards. To reduce the volume of liaison work required of the Government, it was decided that the American Na-

tional Standards Institute (ANSI) would serve as the interface between the Working Group and the Government. A factor in this selection was ANSI's chartered purpose as both a coordination and a standards organization. Thus, Dr. Ralph Showers, Chairman of ANSI Committee C63, will assume responsibility of maintaining an effective flow of communication.

The Government Tri-Service Working Group will continue to meet four to six times a year over the next two-year period. As has been the practice in the past, the revised standard will be circulated through established channels for review and comment. During the preparation process, the professional and industrial organizations may, at their option, circulate available documents and other material for review and comment.

The Government also agreed that once or twice a year it should meet in an open forum with industry representatives. The annual IEEE EMC Society Symposium would appear to be the most logical forum for such a technical interchange. Planning has begun to arrange the first of such forums at the EMC-S Symposium to be held in 1990 in Washington, DC.

IEEE ELECTROMAGNETIC COMPATIBILITY SOCIETY NEWSLETTER is published quarterly by the EMC Society of the Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY 10017. One dollar (\$1.00) per member per year (included in the Society fee) for each member of the EMC Society. Second-class postage paid at New York, NY and additional mailing offices.

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CALL FOR VOLUNTEERS IEEE ADMISSION AND ADVANCEMENT COMMITTEE

The IEEE Admission and Advancement Committee is an Institute committee appointed by the IEEE Board of Directors. Its function is to review applications for IEEE member and for IEEE senior member and to make sure that applicants meet the IEEE membership grade requirements. The A&A Committee meets one day each month at various locations within the U.S. Two meetings occur each year in Boston, in New York, in Piscataway, and in Washington, DC. The other four yearly meetings are held in conjunction with the IEEE Board of Directors Meetings at various locations.

The A&A Committee is actively seeking new members. Volunteers will meet twice per year in one of the cities mentioned above. They must be either IEEE Senior Members or Fellows. Past experience in IEEE activities is highly desirable. The meetings last about half a day, usually from 9:30 a.m. to about 2:00 p.m. Typically, about 25 applications are reviewed at each meeting. The work is both interesting and challenging.

If you are interested in serving on the IEEE Admission and Advancement Committee beginning in January, 1990, please send a letter expressing interest and stating qualifications to: Roseann Schulz, Member Services, IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. Your help will be appreciated.



ELECTROMAGNETIC COMPATIBILITY SOCIETY

Gerald P. Rothhammer, Chairman **Public Relations** Assistant Director/**Professional Services** PLEASE REPLY TO: Eaton Corporation-EID 5340 Alla Road Los Angeles. CA 90066 Phone (213) 822-3061 FAX 213-306-1500 TELEX 910-343-6969

Dear EMC Member:

We offer you a challenge

The EMC Society wants a logo so we are going to have a logo designing contest. Your challenge is to design a winning logo! It is easy, all you have to do is come up with a sketch, something you think represents the EMC Society, and send it in. We'll notify the winner (assuming there is a winning sketch) prior to the 1990 EMC Symposium. Sound like fun? Want to enter but don't know how? Read on ..

Entries should be submitted to:

Janet Zack EATON CORPORATION 5340 Alla Road Los Angeles, CA 90066

Your design(s) need to be received prior to 31 December 1989. They can be in sketch form and should represent measurement as well as analysis --- most of all, they should be representative of the EMC Society.

As an additional incentive, we are offering a \$100 cash prize to the winning designer as well as notoriety at the EMC Symposium and in future EMC Newsletters.

We hope you'll accept this challenge and put your creative efforts to good use. If you need any additional information, call Janet Zack at (213) 822-3061.

Sincerely,

Gerald P. Rothtian

Gerald P. Rothhammer

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

PRESIDENT'S MESSAGE

PROFESSIONAL ACTIVITIES AND PRACTICES

The Professional Activities Committee for Engineers (PACE) is a major committee which functions under the IEEE United States Activities Board. Both PACE and USAB have served important functions within the IEEE since November, 1972. In past years the EMC Society has not participated in nor emphasized the PACE, but this year the Society has an active PACE chairman. Al Mills, a new Director, is the Society's PACE Chairman. He is now building a foundation for PACE activities within the Society and will be attending the National PACE Conference. I would like to present some background on PACE and to describe some of its goals, activities, and services.

When the IEEE was founded in 1963, its chartered purposes, as spelled out in its Constitution, were scientific and educational. Moreover, by omitting any constitutional reference, to non-technical purposes such activities were severely curtailed. Consequently, the Institutes functions were principally technical. It processed and disseminated technical information and recognized the competence and eminence of its members or of other professionals. However, during the history of the IEEE's two predecessor organizations, the AIEE and the IRE, some members had advocated that the organizational charters be broadened to include enhancement of the professional standing of the membership. Debate concerning this issue continued after the IEEE was formed. With the onset of heavy unemployment among members in the late 1960's, additional attention was given to the need for the IEEE to assume a broader role. At the same time, new technological advances had resulted in social pressures and growing concerns about the quality of life. Concurrently, the purposes of learned societies were coming into sharper focus; they had come to be regarded as the cornerstones of technological progress. Many IEEE members continued to advocate an expansion of the Institute's learned, somewhat insular functions. It was felt that the organizations's responsibilities should include concern for the society in which members practiced their professions.

As early as 1969, the IEEE had taken steps, within constitutional constraints, to provide assistance to its membership. However, it soon became evident that if substantial contributions were to be made, the IEEE constitution would have to be amended. An amendment was submitted to the voting members in 1971, but it failed to secure the necessary two-thirds vote. In 1972 the amendment was revised and resubmitted to the membership. This time the



from Donald E. Clark

amendment was approved by 86.8 percent of the members voting.

To deal with the new area of professional activities, the IEEE leadership created a United States Activities Committee (USAC) and levied a special assessment of \$5 on members of Regions 1 through 6 to offset the costs. In 1974, because of the wealth of programs in which it was engaged and the obvious need for a broader structure, USAC was granted Board status within the Institute. The programs of the United States Activities Board serve U.S. members in appropriate nontechnical professional areas including ethical, legislative, and social concerns. Even though USAB's activities are directed toward to the U.S. membership, many of its programs and much of its literature benefit the entire membership and the profession as a whole.

What are the objectives of PACE? Its activities are directed toward achieving the following three objectives.

Member Services deliver professional services to each individual IEEE member. PACE provides guidance to members concerned with issues which might present constraints to lifetime career practice. Guidance is provided in the areas of manpower, employment, pensions, patents, ethical practice, career development, age and sex discrimination, registration, salary surveys, service contracts, and student awareness.

Public Awareness voices the professional and public policy concerns of IEEE members. Public awareness is promoted by developing technology policies, by holding technology policy conferences, and by enlisting public support.

Government Action works to bring about changes at the local, state, and national levels. At the national level, the USAB Committee monitors legislation and drafts legislative proposals on professional and technological policy concerns.

PACE may assist all such efforts at the local level. At the level of state and local government, PACE has expert advisors to assist with technical issues.

One of the major services provided by PACE is the publication of career development literature for engineers. One publication is entitled "Professional Practices for Engineers, Scientists, and Their Employers." As the title indicates, this brochure contains guidance for the both the employer and the engineer. Much of the guidance for engineers applies to career development. Practices which an engineer should take to enhance his/her career include:

Take responsibility for your own career. Who is responsible for career development? Surprisingly, many engineers think that their boss or supervisor is responsible for their career development. Of course, the individual is responsible for his or her own career. A helpful "mindset" is to regard one's career as one's own "business". Each of us offers a service to our supervisor and to our peers.

Perform in a professional manner. As a professional member of the community, the engineer should have a sense of responsibility toward both other members of the profession and individual members of society, be familiar with and conform to the Code of Engineering Ethics, and have a sense of social concern and public service.

Be a mature realist. A professional does not assume that the employer will take care of him and that a job comes with tenure. Recognize that some organizations deal in highly volatile fields and that they are, therefore, subject to periods of both success and decline. In career planning, national economic trends and the vulnerability of the organizations's product should be taken into account. Businesses may prosper, or they may decline as social and political priorities change. Engineers enhance their careers by assessing their employment situations realistically and by taking steps, on their own initiative, to prepare for any career change which might occur.

Anyone who would like a copy of the brochure on professional practices should contact the IEEE-USA Office in Washington, DC and should request IEEE publication No. UH0163-6.

I strongly encourage each EMC Society member to learn more about the activities and services of PACE. It offers an IEEE benefit which should be utilized to enhance career and professional status.

POINT AND COUNTERPOINT

THE SILENT CRISIS SCREAMS - CONTINUED

This column takes up the topic explored in the Spring Issue of this *NEWSLETTER*. That column listed several reforms necessary for combating the "Silent Crisis" -- a coined term for the electromagnetic interference (EMI) which has resulted in serious operational problems in military aircraft and ship systems; in mission failures; in the loss of a ship and aircraft; and tragically, in the loss of life. This column will focus on one proposed reform -- *viz.*, the necessity of defining the external electromagnetic environment (EME) in the procurement documents for systems in aircraft, ships, satellites, and ground radars.

Since these systems will operate in the conditions unique to the EME, a study to identify an appropriate EME is a necessity. Moreover, this study should be completed prior to the issuance of any procurement documents so as to assure the design of a system which performs satisfactorily. Systems contractors would be required to identify the costs of attaining EMC within the defined EME. A further benefit would be the delivery of cost effective systems since



by Anthony G. Zimbalatti

retrofits costs would be unnecessary at best or at least considerably reduced.

Also if procurement documents were to contain incentive or penalty clauses based on achieving system performance guarantees, tied to the defined EME, the contractor would be motiviated to deliver compatible systems. Since present day procurement documents contain no such provision, design compatibility based on the EME is not a concern of the contractor, who can, with impunity, deliver unworkable or even dangerous systems or who can submit a "low ball" bid. Of course, there are pitfalls. Who will define the EME? Who will determine the performance guarantee or the penalty? How can a realistic, cost effective EME be defined?

INTER-SOCIETY ACTIVITIES

EEC DIRECTIVE ON ELECTROMAGNETIC COMPATIBILITY

The Council of the European Economic Community issued Directive No. 89/336/EEC on 3 May 1989. The Directive requires that member states take all appropriate measures to ensure that apparatus placed on the market or taken into service comply with all requirements of the Directive and be so constructed that:

- (a) the electromagnetic disturbance it generates does not exceed a level allowing radio and telecommunications equipment and other apparatus to operate as intended, and
- (b) the apparatus has an adequate level of intrinsic immunity to electromagnetic disturbance to enable it to operate as intended.

The Directive is broadly drawn to apply to apparatus liable to cause electromagnetic interference or liable to have its performance affected by such disturbance. Apparatus is defined to include all electrical and electronic appliances, as well as equipment and installations containing electrical and/or electronic components.

The Directive is to be adopted by 1 January 1991, and the provisions shall apply starting 1 January 1992.



by Donald A. Weber

ISO Adopts EMI Test Guidelines

The International Standards Organization has approved Standard 7737, which defines new guidelines for testing and for classifying the degree to which automotive electrical and electronic equipment be immune to electrical and electromagnetic disturbances by conduction. The new standard describes bench test methods for checking the immunity to transients and recommends various ways of improving equipment immunity. It defines five classes of failure mode severity -- the most serious of which is a non-reversible condition requiring repair or replacement for proper operation. The primary intent of the new standard is to provide common language and parameters for comparison of products.

The Working Group anticipates completing work on a standard for testing and classifying disturbances caused by capacitive and inductive coupling before the end of 1990.

The Working Group is also developing standard methods to evaluate the immunity of the whole vehicle to electromagnetic radiation from the environment based on a consensus that test methods which include the entire vehicle as a working system are the most realistic. The group is presently evaluating seven different methods for evaluating whole vehicle immunity of which the use of an anechoic chamber is considered the most appropriate test.

The seven test methods are: anechoic chamber, transverse electromagnetic cell (TEM), on-vehicle transmitters, bulk current injection, stripline, and parallel plate.

EDITORS' DEADLINES

The essential ingredient of a newsletter is informative and *timely* content. Mailing this NEWSLETTER and current information to all Society members depends upon prompt submission of all articles and features. All Associate Editors are reminded that the submission deadline for the Winter 1990 issue of the *IEEE EMC Society NEWSLETTER* is November 15, 1989.

PCs FOR EMC

APS-S SYMPOSIUM/URSI MEETING

Although this column is slated for October, it is being written just after the 1989 joint AP-S Symposium/URSI Meeting in San Jose, CA. By all accounts, it was a very successful meeting with more than 1130 registrations and some 727 papers listed in the program. The setting was a good one with all the meeting rooms under one roof, even though some distance apart - thus providing a good exercise opportunity. This time there was a workshop on Sunday, in addition to the now-expected Friday workshops and short courses. The exhibits were well-attended; and compared to my recollection of past meetings, the poster session seemed very lively and even more effective. Maybe its just that I'm adapting to them since I haven't been too fond of poster sessions in the past. In any case, the organizers are to be commended for their efforts on a job well done.

There were a number of items worth reporting from the San Jose meeting, and so many others have collected in my files that I hardly know where to begin. However, considering the issue of timeliness, I'll concentrate on happenings at the recent meeting.

CAEME Committee & Workshop

The CAEME Committee (Committee on Computer Applications in EM Education) is chaired by Professor Magdy Iskander of the University of Utah. This committee has submitted a proposal to the National Science Foundation, for the AP Society and under the auspices of the IEEE, to seek funding for the development of computer-based EM courseware. Magdy, the principal author of the proposal; was aided by contributions from AP-S President Irene Peden and Professor Arlon "Bud" Adams, Chairman of the Education Committee. Together, this group organized the workshop at the 1989 meeting. Although put together late and held on Sunday because of scheduling problems, the workshop attracted about forty participants; and about fifteen attendees made presentations and/or demonstrated software which they'd developed. All in all, the workshop generated a high level of enthusiasm among those attending and confirmed in various ways the need for taking advantage of computer technology in EM instruction not only to improve the "product" but also to attract more students to study in this area.

It seems apparent that there are distinct ways in which computer-based technology can be exploited in electromagnetics instruction. First specially-designed or adapted software can be incorporated into regular courses. In realtime, interactive work, students could use the software to solve



by Edmund K. Miller

and display the results of exercises. In this instance, the computer could replace routine mathematical "drudgery" and thus would allow the student to spend more time thinking about the physics involved. Also the student could conduct computer "experiments" with conceptual understanding as the primary goal.

Second, the computer could be used to develop and display the results of solutions to problems where complexity precludes realtime development and thus necessitates storage in some appropriate form. As computer technology continues to advance, the boundary between these two computer uses will continue to change. Advances should create diminished necessity for the "stored-solution" mode (SSM) and greater employment for the "generated-solution" mode (GSM).

For either the GSM or SSM, a key ingredient is the graphical display of the electromagnetic physics being solved. Consequently, the visualization aspect of electromagnetics is becoming ever more important. And this trend holds true for the entire field, not just for teaching. As workers in the field of computational electromagnetics (CEM), we have seen, in working with standard integral-equation models, the size of "large" problems move from the realm of a few dozen unknowns in the early 1960's to a few thousands now. And, with growing use being made of differential-equation models in both the frequency domain and the time domain, problems having up to hundreds of millions of field samples are beginning to become more common. Describing such problems to the computer, let alone interpreting the results obtained, obviously requires "massively graphical" display systems as well.

Validating Model Results

The topic of software validation was covered at a Friday workshop. I was reminded of some experiences in running and validating model results. When I first became involved in Moment-Method applications a few (I wish!) years ago, there were few solved problems and guidelines from which to develope confidence in these "new fangled" numerical results. Every problem was a new one, where in the event of a discrepancy between the numerical result and measurement, there developed a saying, "Everyone believes the measurement but the experimentalist, while no one believes the computation but the modeler." Apparently, experiments are thought to reveal the truth, at least by those who are not directly involved in their conduct. On one occasion, my coworkers and I had computed the RCs of straight wires a few wavelengths long and had obtained good agreement with some measurements made by Val Liepa of the University of Michigan Radiation Laboratory. We then did calculations for some longer wires. We presented these calculations to our sponsors, who were appropriately skeptical because three or four wavelengths were not ten or twenty.

Lacking our own experimental facilities, we were fortunate to obtain a measurement from Keith Hazard (then of AVCO) for the RCs of a wire about eleven wavelengths long. We were chagrined to find that our model results, although tantalizing similar, were shifted in both amplitude and angle from the experimental data. After failing to find an explanation in the computer code (a forerunner of NEC) or in the model data, we reluctantly relayed this conclusion to Keith and asked if there were anything about the measurement which might be relevant. Further discussion revealed that the "thin wire" being measured was truly thin. Since it was not stiff enough to be self-supporting, it had been attached to a thin styrofoam rod for the measurement. Upon repeating the model computation using a frequency scaled upward by the square root of the rod's relative permeability, we were tremendously pleased to find this new result in much closer, albeit not perfect, agreement with the experimental data.

The crucial points in this case are that knowing the experimental conditions is vitally important for the modeler and that the numerical result can be just as correct in its way as the measurement is in its. It has been my lot (together with numerous colleagues with whom I've worked) to encounter other similar experiences, which I may describe from time to time. If any readers have had these kinds of things happen and would be willing to share the story, please let me know. I plan to include in future columns a continuing dialog on the general problems of software validation, including examples of "what can go wrong."

IEEE CONTRIBUTES TO EMC STANDARDS DEVELOPMENT

At the May 22, 1989 meeting Committee AE-4 (Electromagnetic Compatibility) of the Society of Automotive Engineers reviewed the status of standards used in various sectors of the EMC community. Meeting at the Radisson Hotel in Denver, CO, members were reminded that they were participating as individuals and not as representatives of any organizations. Participants turned their attention to the following topics:

Specifications for Space Station Program

Members of AE-4 were asked once again to join the Space Standardization Advisory Committee. The request for space standardization originated within NASA Headquarters since, at present, no suitable specifications exist for this program.

The present procedure is to tailor documents, but the amount of tailoring has become so extensive that the number of pages of tailoring now exceeds the number of pages of original specifications. The question of opening an EMI task was broached.

AE-4A Systems

The SAE has decided to issue the specification on system compatibility as an aerospace recommended practice. Preliminary information relating to a possible tailoring guide for the specification has been received, and the proposed ARP will be issued. Comments and discussion were deferred to the next meeting.

AIR 1423

An initial revised draft of AIR 1423 will be circulated for comment to people involved in gas turbine engine EMC. Comments will be incorporated and a review scheduled.

Damped Sine Wave Test Method

A revised test method was sent out as a National Committee Ballot. Many approvals were received, but some disapprovals were received as well. Several comments received involved in-depth technical issues. Technical experts will be consulted to resolve the areas of concern, and a revised method should be ready for review at the next AE-4 meeting.

Liaison

Developments in ongoing work with other organizations were noted.

- The American National Standards C-63.2, C-63.4, and C-C63.12 are currently being updated.
- The Federal Communications Commission has issued a new FCC Part 15.
- CISPR 22, the Information Technology Equipment Specification, has been adopted in Japan. In Europe, this standard is in use as European Norm EN 50022. Also CISPR "Handbook Publication 16" is being prepared in three parts; release is scheduled for 1990.

The IEEE EMC Society reported on its standards efforts:

Standards Status

| 139-1988 | [ISM] | Available from the IEEE Service Center as catalogue number SH-12377. | | |
|---|---------------------------------------|---|--|--|
| 140-1950 | [RF Heating] | The IEEE Standards Review Committee requires defini- tions before accepting this standard. | | |
| 187-1951 | [Open Field] | Comments from coordina- tion with ANSI C63 are awaiting resolution by the working group. | | |
| 299 | [Shielding] | Ed Bronaugh is working with the IEEE Standards Office to obtain a polished, typed version, suitable for review. | | |
| 475-1983 | [Field Sensors] | A reaffirmation ballot is due from the working group chair. | | |
| P478 and P482 | [Connector and Cable Shielding] | Updated at TC-4 Meeting in Denver. | | |
| P509 | [Gaskets] | Turned over to TC-4 for further action and recommendations. | | |
| P626 | [Grounding] | Status report is overdue; Working Group Chairman to update the Program Appraisal and Review. | | |
| P1128 | [Absorber Eval.] | Tutorial and Working Group Meeting held at Denver. | | |
| P1140 | [E & H Field] | Volunteers needed for writ- ing tasks; revised Program Appraisal and Review sub- mitted to NESCOM. | | |
| P1190 | [LISN Cal.] | Work program and target dates needed from the Working Group Chairman. | | |
| Note - Information supplied by EMC-S Standards Committee, Steve Berger, Secretary. | | | | |

1990 IEEE INTERNATIONAL SYMPOSIUM ON ELECTROMAGNETIC COMPATIBILITY

August 21-23, 1990

The IEEE International Symposium on Electromagnetic Compatibility (EMC) will be held in Washington, DC from August 21 through 23, 1990. The Symposium is sponsored by the EMC Society of the Institute of Electrical and Electronics Engineers. The EMC Society seeks original and unpublished papers on all aspects of EMC including the following categories:

EMC management
EMI control
Socio-economic implications
EM product safety
EMC measurements
Non-sinusoidal signals
Spectrum management
A call for papers has been issued; a 50-75 word abstract and a 500 to 700 word conclusion should be sent to: Dr. William G. Duff Atlantic Research Corporation 5390 Cherokee Avenue Alexandria, VA 22312

EM environment

For information on other aspects of the Symposium, write IEEE EMC International Symposium on the Electromagnetic Compatibility, P.O. Box 19342, Washington, DC 20036.

"Every man owes a part of his time and money to the business or industry in which he is engaged. No man has a moral right to withhold his support from an organization that is striving to improve conditions within his sphere."

-President Theodore Roosevelt-1908

BOD ACTIVITIES

BOARD OF DIRECTORS MEETING IN DENVER



by Donald N. Heirman

The second Board meeting of 1989 was held between 9:30 a.m. and 5:00 p.m. on May 22, 1989, at the Radisson Hotel in Denver, in conjunction with the annual EMC Symposium. Board members in attendance were Don Clark, Ed Bronaugh, Dick Ford, Bob Haislmaier, Don Heirman, Bob Hofmann, Gene Knowles, Henry Ott, Dan Hoolihan, Al Mills, Gene Cory, Don Weber, Len Carlson, Walt McKerchar, Charlotte Tyson, Herb Mertel and Chet Smith.

After approval of the agenda, President Clark discussed the Society's Plan for the Year. Acting secretary Dan Hoolihan reviewed the minutes from the February 18 meeting. After minor changes, the minutes were approved. Next, Dick Ford presented his Treasurer's Report. Our Society's net worth as of February 28, 1989, is \$325 K, approximately the same as that for October, 1988. Our long term investment is approximately \$180 K. Also the report closely tracks expenses against income for 1989 and projected expenses for 1990. The Treasurer's report was approved by the Board.

Vice President Ed Bronaugh presented EMC-S Long Range Plan, dated May, 1989. The plan calls for a reorganization of the committee reporting structure for each Service Director, for the Executive Committee, and for other administrative functions. The BoD is to respond with suggestions or comments before its next meeting. One facet of this plan is the new Representative Advisory Committee (RAC), established to improve the work and the reporting structure of the following committees:

- Committee on Man and Radiation (COMAR)
- Energy Committee
- R & D Committees
- IEEE Standards Board
- U.S. National Committee of URSI
- CCIR Study Group 1
- ANSI C-63 Liaison
- CBEMA Liaison
- EIA G-46 Liaison
- SAE AE-4 Liaison

The RAC advisor is Andy Farrar. Andy is now organizing the RAC, which will report to the Director for Technical Services Don Heirman. Andy's telephone number is (703) 789-7505. Anyone interested in the above committee activity should give Andy a call. Next, Len Carlson presented his report on proposed changes of the EMC Society Bylaws. Changes would include practices for the nomination and election of members at large for the Board of Directors, the extension of terms of office of committee officers by the directors to whom they report, and the formation and maintenance of certain standing and ad hoc committees.

The remaining items discussed were as follows:

- 1. Director Bob Haislmaier (Communications Services) presented his report. Bob reported that there had been some problems with late mailings of the *EMC-S NEWS*-*LETTER* which were being corrected. Also the Board recommended that no abstracts be published for papers which are not readily available in English to Society readers. Moto Konda, *Transactions* editor, indicated his feeling that sufficient material was available; and he questioned the idea of publishing special issues.
- 2. Gene Cory, Symposium Committee Chairman, presented a report on upcoming symposiums. A \$3,000 advance was authorized for the 1991 Symposium in Cherry Hill, NJ. The Atlanta Chapter and the Board approved scheduling the 1995 EMC Symposium for Atlanta, GA. Also, Gene presented his revised "Guide for Organizing an IEEE EMC Symposium." Copies have been sent to the 1987, 1988, 1989, 1990 and 1991 chairmen for their use, review, and comments. Society members on steering committees should take this opportunity to pass along suggestions on items which might be improved. Anyone requiring a copy of the "Guide" should call Gene at (512) 736-0714.
- 3. Director Don Heirman (Technical Services) presented his reports. First, Don provided a report on the activities of the EMC-S Standards Committee. Project 1140 on Near-Field Electric and Magnetic Strength Measurements is active and has focused its work on the range 3 kHz to 30 MHz. Those interested in joining this effort should call Don at (201) 834-1801.
- 4. Henry Ott then presented his Education Committee Report, and Dave Hanttula, Chairman of the Distinguished Lecturer Program, indicated that Ed Bronaugh and Joe Fischer had been selected as new lecturers.

Their terms will end on June 30, 1991. Dave indicated that \$2,924 has been spent on travel and living for the lecturers. Thus far there have been eight presentations. For more information and a listing of all lecturers and their telephone numbers, call Dave at (415) 656-1661, ext. 249. Dave mentioned that next year there will be a concerted effort to present EMC lectures to outside organizations. Henry then described our interest in the IEEE Self-Assessment Program, which will be used by Society members to gauge their proficiency in EMC subjects. The assessment test on these subjects will be prepared by an ad hoc committee now being formed within the Education Committee. More on this topic in the next NEWSLETTER. Finally, Henry announced his resignation as Education Committee Chairman, a post he has held successfully for close to ten years. The Board then approved his successor Dr. Clayton Paul of the University of Kentucky. We all wish to thank Henry for his fine efforts on behalf of our Society.

- 5. Wilf Lauber, Chairman of the Technical Advisory Committee, presented his report. The symposium work required of the technical committees, its benefits, and problems were reviewed. He stressed the role of the TCs as a symposium resource for review of technical papers, session chairmen, and workshop/tuturial organizers. He spelled out the criteria for paper reviews used by the TCs. Wilf noted that both the 1990 and 1991 Symposium Technical Papers Committees will make full use of these TC Services. Any questions regarding this approach should be directed to Wilf at (613) 998-2377.
- 6. Director Bob Hofmann (Member Services) gave his report. Charlotte Tyson, Awards and Membership Chairperson, indicated that the EMC Society ranked fourth in growth among all societies. A ten percent increase brought Society membership up to 3530 as of December 31, 1988. By April, 1989, membership was up 11.2% when compared with that point last year. Dan Hoolihan, Chapter Activities Chairman, reported that indications of interest in chapter formation have been received from both Spain and Sweden. Bill Duff, Fellow Evaluation Committee Chairman, indicated that there are seven strong candidates for Fellow now being reviewed by his committee.
- 7. Director Walt McKercher (Professional Activities) handed out the new "EMC Society Membership" brochure. For copies, contact Walt at (206) 779-7069. Walt described an idea for a logo contest to create a more readily identifiable symbol for the EMC-S. The Board approved a \$100 award for the best logo. The contest is open to all members. Contact Walt for further details.
- 8. President Don Clark then discussed several items of old business. A discussion ensued on whether to consider the appointment of a permanent Symposium Exhibitor Chairman. The consensus of the Board was to retain the present process of using a local Exhibit Chairman, who is a member of the Symposium Steering Committee. The Board approved the organization of the Representative Advisory Committee (RAC).

- 9. Under new business, the Board approved the participation by Dan Hoolihan, Chapter Activities Coordinator, at the IEEE Congress. The purposes of this Congress is to enhance interaction within the Institute. Don Heirman discussed the response to a letter from Walter Poggi which questioned the role of the new Technical Committee on Product Safety (TC-8). Dan read the response from Rich Pescatore, Chairman of TC-8. Rich indicated that TC-8 would restrict its activities to product electrical safety and that there was no intention to influence other areas within the discipline of EMC, including existing or planned standards which do not specifically address the issue of product safety.
- 10. The Board approved cooperating with the SUMMA Foundation and the Antennas and Propagation Society in sponsoring a Nuclear Electromagnetic Pulse Meeting to be held May 28 through June 1, 1990 in Albuquerque, NM. Don Clark then discussed the meeting which he, Ed Bronaugh, and Don Heirman had with the Wroclaw Symposium Committee. This meeting took place at the 1989 Zurich EMC Symposium. Don Clark will need to appoint a Board, or other Society member, who is planning to attend the 1990 Wroclaw Symposium, to act as our EMC-S representative. Herb Mertel will handle the liaison question in his role as Transnational Committee Chairman. Herb can be reached at (619) 578-1480.
- 11. The Board agreed to approve participation by the EMC-S in the next Region 10 Collquium, scheduled for October, 1989. An amount up to \$3,000 has been allotted for travel and living expenses. The participant will present material on EMC to the participants. Next the Board approved the EMC-S Plan-of-the-Year. Don Clark gave his TAB report; and Len Carlson, Division IV Director, gave a report on recent divisional activities.
- 12. Herb Mertel, Chairman of the Transnational Committee, reported that twenty-three new EMC-S members were recruited at the IEEE booth at the Zurich EMC Symposium in March. A similar booth was scheduled for the Symposium in Nagoya, Japan.
- 13. Coordinator Al Mills gave his PACE (Professional Activities Council for Engineers) report. The various councils of USAB (United States Activities Board) were described. For more information, contact Al at (619) 463-2123. Bob Brook, Liason with the Society for the Social Implications of Technology (SSIT) submitted his written report which covered the information presented at the March 11 SSIT meeting in New York.

President Clark ended the meeting by announcing the date for the next Board Meeting - Monday, November 13, 1989, at the Innisbrook Resort in Tarpon Springs, FL. The EMC-S Standards Committee will meet for ninety minutes in the same room immediately preceding the Board Meeting. For more information, contact Janet O'Neil at 1-800-325-9814.

Respectfully submitted, Don Heirman, Associate Editor

EMC CERTIFICATION AND ACCREDITATION

PROGRESS REPORT

Certification of EMC technical personnel is gathering momentum. This phenomenon was in evidence at the August 1989 EMC Expo, sponsored by Interference Control Technologies and held in Washington, DC. The National Association of Radio and Telecommunications Engineers (NARTE) had provided individual bronze name tags for all certified EMC personnel. It was easy to spot those who had made the commitment. They wore the tag prominently and proudly. I wore mine! In fact, I have continued to wear mine on my jacket or shirt to catch the eye.

NARTE has processed certification for 241 EMC personnel. This number includes 184 engineers and 57 technicians. Thus far, only two applications have been deferred because they lack the minimum practice time required. The requirements are six years for an EMC technician and nine years for an EMC engineer. To qualify in both categories, the applicant must have met the required number of years for each discipline in separate time frames. In brief, there can be no overlapping. Also a person who qualifies as both a technician and an engineer must pay two renewal fees since NARTE must maintain two separate records.

Candidates for certification by eminence must submit a set of ten questions and solutions. These will be added to the examinations database to expand the number of questions based on actual experience. Currently the examination consists of approximately 500 questions which have been reviewed and refined so as to reflect the overall technical area. Questions which have been submitted by "grandfathered" candidates are currently under review. The first priority is to assure that the questions are written clearly. There can be no unexplained acronyms, no local or serviceconnected jargon, and no technical errors. Submissions from the practicing community have contained a number of these errors and have required more careful editing, but the benefit of obtaining examination problems based on real situations makes the extra effort worthwhile.

It would be most helpful if each question preparer would indicate the intended technical category - *i.e.* shielding, bonding, signal processing, etc. Often the examination board can find several categories into which a given question might be placed. Also there are several categories for which questions have not yet been developed. For future application packages, NARTE is preparing a flyer which lists categories short of questions. A future *NEWSLETTER* will publish a call for volunteers who will sit for portions of a "trial examination."



by Russell V. Carstensen Certified EMC Engineer

Meanwhile, real progress is being made in the area of laboratory accreditation. Thirty-two candidate assessors have been trained. The majority of the assessors are not Navy civil servants. The final training phase will be a "dry run" accreditation. This will be carried out at the Pacific Missile Test Center, Point Mugu, CA, a Navy laboratory. This choice means that a private lab will not serve as a "guinea pig." Six of the candidate assessors are at PMTC; thus, they will not be included in the first group of candidates because they will have to serve as operators for their lab.

Although there has been some anxiety over laboratory accreditation, every effort has been made to structure a balanced, impartial accreditation process. All assessor applicants must be proficient in MIL-STD-462 test techniques. Initially, no assessor applicants were accepted if they worked for a lab which might be expected to apply for accreditation. NIST made an exception for civil servants working in labs only when it became evident that there might not be enough trained assessors to process the possible upper limit of possible applicant labs. Candidate labs are protected from possible instances of conflict of interest. NIST provides the names of assessors assigned to the candidate lab in advance of their arrival, and labs may request alternatives without explanation.

There is a strong policy against creating any artificial shortage of accredited labs. Also laboratories will be accredited in groups so that no one lab will have a "jump" on the remainder. When assessing an individual lab, assessors will aim for correcting any deficiencies by working cooperatively with the applicants. Obviously, in the very act of applying, the lab has demonstrated a commitment and intent to adhere to NVLAP standards.

Part of the perceived anxiety concerning lab accreditation stems from the widely-recognized shortcomings of MIL-STD-462. In a separate effort, the Space and Naval War-

^{*} Editor's note - see page 1.

fare Systems Command has initiated a Tri-Service Review of MIL-STD-462. This review is expected to take some time for examination of the standard, the proposal of changes, and coordination of those changes with the technical community. This review presents an excellent opportunity, and any specific standard deficiency perceived during the accreditation process can be passed along to SPAWAR for consideration during the revision process.

The NVLAP accreditation process is entirely independent of the Navy. The National Institute of Standards and Technology is an agency of the Department of Commerce. The Navy has no control over the NVLAP administrative procedures. This relationship was created to assure objectivity and the accreditation of Navy-owned labs by the same standard to which the civilian labs are held.

Laboratory accreditation forms are now available. They can be obtained by contacting NVLAP

There is one last reminder. The "grandfather" period for certification as either an EMC engineer or EMC technician ends at midnight on 17 May 1990. Those with the requisite education and experience to qualify must postmark the application prior to 0001 on 18 May 1990. That deadline may seem a long way off, but it is less than nine months away. Apply early so as not to be caught off guard by the deadline.

CONTACTS FOR MORE INFORMATION

Application forms, the "Personnel Certification Handbook," and the "Study Guide" are available from NARTE. Their address is:

The National Association of Radio and Telecommunications Engineers, Inc. P.O. Box 15029 Salem, OR 97309 Telephone: (503) 581-3336

Application forms and the "NVLAP EMC Laboratory Accreditation Handbook" are available from NVLAP. The address is:

NVLAP National Institute of Standards and Technology Gaithersburg, MD 20889 Telephone: (301) 975-4020

Regular progress meetings on EMC accreditation and certification are sponsored by NAVAIR and are open to the public. For schedule information, contact:

Commander Naval Air Systems Command (AIR-5161) Washington, DC 20361 Telephone: (202) 692-8600

SIXTH ANNUAL REVIEW OF APPLIED COMPUTATIONAL MATHEMATICS March 19-23, 1990

The Sixth Annual Review will provide a forum for information exchange among practitioners of applied computational electromagnetics. It is sponsored by the Applied Computational Electromagnetics Society and DOD/USA ECOM, USAISESA, NOSC, and DOE/LLNL in cooperation with the IEEE Antennas and Propagation Society, the IEEE Electromagnetic Compatibility Society, and URSI Commissions A and B. It will take place at the Naval Postgraduate School, Monterey, CA.

Contributions by both users and developers of electromagnetic computer modeling codes are encouraged. Topics should be derived from experience gained in practical applications. The Review will highlight topics related to the design, selection, performance, and implementation of current and emerging electromagnetic modeling codes and techniques.

SUGGESTED TOPICS

Codes, modifications and applications Moment methods Finite elements and finite differences Spectral domain techniques GTD and asymptotic techniques Graphical input/output issues Code validation New mathematical algorithms

APPLICATIONS

Antenna analysis Electromagnetic Compatibility Electromagnetic interference Scattering MMIC technology Microwave components

Prospective authors are requested to submit a one-page abstract of their presentations by January 6, 1990 to the Program Committee Chairman. A camera-ready summary of the presentation will be required later.

> Dr. Scott Ray Program Committee Chairman Lawrence Livermore Laboratory P.O. Box 5504, L-156 Livermore, CA 94550

EMC PERSONALITY PROFILE





by William G. Duff

MYRON L. CRAWFORD

Myron L. Crawford was born in Orem, Utah on October 29, 1938. He received the B.S. degree in Mathematics from the Brigham Young University, Provo, Utah, June 1960, and the M.S. degree in electronic engineering from the University of Colorado, Boulder, January 1968. Mr. Crawford joined the Electromagnetic Field Division of the National Institute of Standards and Technology (formerly the National Bureau of Standards), Boulder, Colorado in 1960 and has worked in numerous positions since then. His first assignment, from 1960 to 1963, was with the RF Fields and Antenna Section where he worked to develop, improve and maintain the national field strength standards for field strength meters and for antennas calibration. He then transferred to the CW Power Standards Group where he developed and evaluated instrumentation for precision power measurements and calibration. While with this group, he developed a new design for a coaxial thermistor mount for precision cw power measurements, a new dualload coaxial calorimeter for use to 10 GHz as a national reference cw power standard, and directional couplers for use in precise cw power measurements.

In 1971, he transferred back to the Fields and Antennas Section and was given responsibility for projects related to EMC analysis and control, field strength and power density measurements, and antenna measurement theory and applications. He developed the most accurate measurement technique known for evaluating anechoic chambers using a new NBS-developed isotropic probe and scanning device to evaluate the reflectivity levels inside the chamber. He assisted radio and TV broadcasters in evaluating and minimizing radiation hazards associated with maintaining and servicing antenna systems and support towers, and he assisted in developing computer techniques and measurement procedures for extending planar near-field measurement techniques to broadbeam antennas either on or off aircraft. Since 1975, Mr. Crawford has been a project leader in the EM Fields and Interference Metrology Group at NIST which is responsible for the development and evaluation of techniques and equipment for measuring the EM susceptibility and emissions of electronic equipment. He is best known for his development and design of the TEM (Crawford) cells and reverberating chambers for performing EMC and TEMPEST measurements of electronic components and systems. The application of the TEM cell has grown substantially through his efforts and is now included in numerous EMC test standards used by the automotive, TV and home entertainment products, biological effects, and other electronic industries, as well as the Department of Defense. In December, 1984, he received the Bronze Medal Award, the highest award offered by NIST, in recognition for his "outstanding contributions to measurements and standards for electromagnetic interference." He is the author or co-author of over sixty technical papers and reports.

Mr. Crawford is a member of the American National Standards Institute (ANSI) C63 EMC committee and a member of the Society of Automotive Engineers (SAE) EMI Standards and Test Methods Committee. He had served as chairman of the SAE EMI Committee from 1975 to 1985. He is also a member of the International Standards Organization (ISO) U.S. Technical Advisory Group for ISO/TC22/ SC3/WG3 (Road Vehicles/Electrical Connections/Electrical Interference), and a member of the U.S. Advisory Group to CISPR (International Special Committee on Radio Interference) Subcommittees A and E. He is a senior member of the IEEE and a member of the EMC Society.

His hobbies include service to the Boy Scouts of America as a scout master or explorer leader for over 20 years, a love for music, and church service.

CHAPTER CHATTER



Predictably, the summer season did not generate a great deal of news, but a last minute letter from the Tokyo Chapter brought word of these very active EMC-S members.

DENVER SYMPOSIUM

About twenty chapters were represented at the Chapter Chairpersons' Breakfast. Brief run-downs on individual chapter doings and plans were given. Favorable comments regarding the Distinguished Lecturer Program were made by several representatives. Al Mills reported briefly on the status of PACE activities. BoD President Don Clark and Gene Knowles also contributed to the meeting. [Thanks to Dan Hoolihan for the input.]

CENTRAL NEW ENGLAND

Chapter officers held a meeting in August to discuss 1989-90 program plans. Chet Smith also contributed. The only definite agenda item thus far is a talk by Dan Hoolihan, scheduled for October 18. The topic had not been pinned down by deadline. [Thanks to John Clarke for his input.]

NEW JERSEY COAST

The September 1, 1989 Chapter Meeting featured Dr. Ezekial Bahar, Durham Professor of Electrical Engineering at the University of Nebraska, Lincoln, NB. His topic was "Full-wave Theory Applied to Computer-aided Graphics for 3D Objects." Dr. Bahar's presentation compared his new reflection model with previous ones. He also explained the practical application of the model to computer-aided design of manufactured objects.

Columnist's Note - I don't believe that this joint EMC/VT/AP Chapter's clever logo has ever been published in this *NEWSLETTER* before so here it is below.



by Charles F. W. Anderson

TOKYO

Seven papers were presented at the April meeting in Matsuyama-shi. Two were particularly interesting. EMC-J 89-2 covered some theoretical investigations of near-field wave-impedance distributions for electric and magnetic dipoles, for half-wave dipoles, and for small loops and short helixes. EMC-J 89-5 described a ventilation panel using carbon-graphite threads for absorptive shielding. There were eighteen attendees, six of whom were IEEE members.

At the May meeting in Kofu-shi, eight papers were presented. EMC-J 89-10 was a report on investigations of absorption-type paints using ferrites. EMC-J 89-13 covered the location of resonant loops on PC boards by means of a short duration pulse excitation. EMC-J 89-15 compared UHF and VHF radiation measurements for lightning stroke location. It was noted that the UHF spectrum had much less background noise when compared with the VHF spectrum. There were sixty attendees at the meeting.

The June meeting was held in Kagoshima-shi. Incidentally, Kagoshima is on the island of Kyushu, over 900 kilometers southwest of Tokyo. Sixty attendees heard twelve papers covering a variety of topics. EMC-J 89-19 dealt with the effects of a human body on EM field patterns. EMC-J 89-22 covered the theoretical shielding effectiveness in magnetic dipole fields. There was also an account of a survey of problems in small-power communications systems, and Professors Sato and Echigo summarized the status of EMC education in Japanese universities.

Six papers were presented at the July meeting in Tokyo. Topics included a report on composite ferroelectric/ferromagnetic absorbing materials and an investigation of a means of reducing ambient noise in open space EMI testing -- which achieved over 30 dB improvement. Thirty-five attendees included fifteen IEEE members.

PRODUCT SAFETY

COMMITTEE REPORT

A traditional essay required by teachers at the beginning of the school year is "How I Spent My Summer Vacation." Usually a trip to some semi-exotic location becomes the central theme. By the fall of 1990, many product safety professionals should be able to describe their August visit to the EMC Society Symposium in Washington, DC. By next fall, the historic first of a Product Safety Session should be an accomplished fact. Some participants would probably include their thoughts and feelings about presenting their papers at the Session. Others might reminisce about their successful efforts to organize and to coordinate all the necessary details which made events run so smoothly. It is likely that most would emphasize the enlightening and enjoyable experiences which attendance at the Symposium made possible. And most significantly, the engineering discipline of electrical safety and everyone participating will have taken another step forward along the path of professional excellence.

Now I'll climb down from my soapbox and sit down behind the recruitor's desk. I am sure that everyone agrees that the goal of a Product Safety Session at the EMC-S Symposium is worthwhile and should be supported – at least theoretically. However, without practical support it cannot happen! Fortunately, the Symposium Liaison Chairperson will be happy to accept offers to contribute time to this cause. Please contact:

John Knecht c/o Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062 Telephone: (312) 272-8800, Extension 3416 Fax: (312) 272-8129

John will be looking for two kinds of participation – help in planning, setting up and running the Product Safety Session and the submission and 'presentation of papers. Although there has been no official "Call for Papers" as yet, considerable interest has been expressed. Contributors should not wait too long to submit proposals since presentation sessions at the Symposium will be limited. The Symposium presents a unique opportunity to advance an individual vision of product safety, as opposed to maintaining a company position. This statement is not intended as "subversion" but simply points out that individual interests and corporate interests do not always coincide. Exactly what does product safety mean to each of you? Of course, nothing will happen unless some good souls volunteer to



by John McBain

attend to the details of bringing the Product Safety Session into existence. Just say, "Yes!" Give John a call!

Meanwhile progress continues on other projects. "The Product Safety Newsletter" is conducting a reader survey for two purposes. First, the mailing list should be updated to include those truly interested in the "Newsletter." Second, the editorial staff wants to determine exactly who these people are -- i.e., what are their IEEE affiliations. Since the EMC Society is helping to support the publication of the "Public Safety Newsletter," we would like to know how many readers are actually EMC-S members. Also if a considerable number of readers belong to another IEEE Society, perhaps that Society would be interested in contributing support. To simplify considerably, two or more societies sponsoring a particular technical interest create a Technical Council, the next step toward becoming a fullfledged Society! Please return the reader surveys and pass along copies to others who might be interested.

Another exciting PSTC trend has been an increase in the number of inquiries regarding the formation of local groups. Individuals from California, Florida, and New Jersey are currently pursuing the possibility of holding organizational meetings. Anyone who's interested, who believes that others in the locale are interested, and who has the all-important time and energy to devote to the start-up should call me at (408) 447-0738. Raleigh, NC, I'm expecting to hear from you!

At the local level, established PSTC groups are starting new activities beyond regular technical meetings. The Santa Clara Valley group helped to judge a local Science and Engineering Fair and is planning to hold a Product Safety Seminar. The North East group announces its meetings in a four-page local newsletter, and other groups are following suit. The amount of interest and enthusiasm is great to see -- especially considering the time pressures every volunteer must face. And speaking of time pressures, it's time to end this column. Until next time!

DIRECTOR'S REPORT

DIVISION IV



by B. Leonard Carlson

Two meetings of the IEEE Board of Directors have been held since I was elected as Division IV Director on Electromagnetics and Radiation. As 1986/87 EMC Society President, I had been a member of the Technical Activities Board so I was prepared for business as usual. However, I am happy to report that under the guidance of Dr. Troy Nagel, VP for Technical Activities, many innovations have been instituted which focus TAB activities on policy issues important to the societies. One innovation was the establishment of a day-long Publication Workshop and a Society Presidents' Workshop and Forum during the TAB Meeting. Contrary to past practice, Division Directors are asked to participate; and they thus acquire firsthand knowledge of societies' problems, which can then be relayed to the TAB Op/Com and eventually to the IEEE Board of Directors.

One issue which clearly bears discussion is the relationship between the chapters, the parent societies, and sections and regions. The "care and feeding" of the technical society chapter is the responsibility of both the TAB and the Regional Activities Board (RAB). According to the IEEE document entitled "Chapter Operations - A Guide for Sections" both the TAB and the RAB are considered guardians of the chapters. To quote this guide, "Chapters are units within IEEE sections formed to serve the specialized technical interest of Society members and to coordinate these with local activities of the Sections and broader activities of the parent Society." Additionally it states, "The Chapter, operating in concert with its parent Society and the Sections, plays a major role in fulfilling the objectives of the IEEE."

In other words, the chapters serve two masters - the technical society which founded the chapter and which reflects the technical interests of its members and the section which serves the geographical region in which the chapter is located. Both the TAB and the RAB have transnational responsibilities and interests, and it is the chapters which relay these priorities to the membership. Chapter officers should be made aware of these two masters and their roles in providing support. RAB is to ensure proper operation of chapters within its geographical region. On the other hand, the TAB, through the parent technical society, must provide the chapters the technical and financial support which assures the availability of quality programming. I know that many years ago as a chapter chairperson, I did not comprehend the interrelationship between the IEEE geographical section and the technical society.

To further understanding, the TAB and TAP Op/Com have passed a motion directing the RAB/TAB Chapters Committee to prepare a brief document covering the manner in which chapters interact with sections and societies. The documentation is to include such basic information as financial resources, the chain of command, and reporting requirements. Unfortunately, many societies believe that their chapters are alive and well because of reports in newsletters and coordination with the chapter chairperson. Meanwhile, the section is filing the chapter bankruptcy papers with the regional director because administrative requirements were not fulfilled!

There will be a Sections Congress in Toronto in October, 1990; and society chapter coordinators are encouraged to attend, to discuss chapter problems, and to provide guidance in their resolution. Another significant action taken by TAB/TAP Op/Com is a proposal allowing the IEEE General Manager to expedite chapter formation, providing that society presidents are notified of new chapters on a timely basis. Currently, to insure that administrative requirements are met, society presidents must approve formation of a new chapter. This new proposal means that societies will grant automatic approval for a limited time.

In conclusion, the chapter chairperson and his/her committee must be aware of the role of RAB/TAB in each chapter's well-being. Given the short corporate memory of the IEEE volunteer structure, this vital message requires continuing repetition. Any chapter officer with questions concerning chapter formation or administration, should contact the society chairperson or president. If all else fails, give me a call at (206) 773-6297.

TECHNICAL ACTIVITIES by Edward F. Vance

JOINT TECHNICAL COMMITTEE ON THE NUCLEAR ELECTROMAGNETIC PULSE

The Joint Technical Committee was established, as its name implies, as a joint committee of the Electromagnetic Compatibility Society and the Antennas and Propagation Society. Edward Vance is the co-chairman for the APS. Louis Libelo is vice chairman for the EMC-S. This committee was formed after the *Joint Special Issue on EMP* was produced by the two societies in 1978. [See EMC 20, February, 1978; AP 26, January, 1978.]

When a nuclear weapon is exploded above the atmosphere, high-altitude nuclear EMP is generated within Earth's atmosphere. Simultaneously, large areas of the surface below the bomb blast are exposed to a large transient field. We cannot simulate this large simultaneous exposure, and systems are not exposed to it during routine operations. Thus, engineers are faced with the need to understand EMP interaction without ever really experiencing it.

The Joint Committee is concerned with the generation of EMP, its interaction with systems, the protection of systems from EMP, and the protocol for verifying that the protection is adequate. Thus the Committee delves into fundamental issues of transient interaction with systems and into transient (broadband) interference control. Consequently, it is common to find EMP technologists who are also active in lightning research and high power microwave studies.

The current focus throughout much of the EMP community is on EMP protection procedures. This committee has provided recommendations for surge protection requirements to a Power Engineering Society Working Group. Also, it has evaluated the shielding properties of composite materials. A number of workshops have been organized; the most recent, on standards issues, was held at the international EMC-S Symposium in Seattle, WA in 1988. Often special sessions on EMP and related topics are organized for EMC-S symposia.

In addition to coordination with APS and other IEEE societies, TC-5 cooperates with the international community in organizing technical sessions for the Zurich International EMC Symposium and for URSI Commission E. It participates in the biennial Nuclear EMP Meeting held in the United States in even-numbered years -- i.e., Menlo Park, CA, 1988, and Albuquerque, NM, 1990.

Although it is not a formal activity of TC-5, the co-chairmen and other committee members regularly serve as faculty for the EMP Short Course, which has been given in such diverse places as Socorro, NM; Ann Arbor, MI; Nottingham, England; Interlaken, Switzerland; Yznerum, Sweden; and Karmiel, Israel. This September a course was held in Bangalore, India.

CALL FOR BOOK REVIEW EDITOR

A member of the EMC Society is needed to fill the position of Book Review Editor. The ideal candidate would be familiar with the body of EMI/EMC literature and would possess the initiative to solicit review copies of likely publications. Combining this scrutiny of current publishing efforts with an analytic turn of mind and the ability to meet dead-lines will provide a *NEWSLETTER* column which performs a vital service to readers. Of course, an added benefit is a unique opportunity to examine a wide variety of publications while aiding the EMC Society. Interested members should contact:

Robert D. Goldblum, Editor EMC-S NEWSLETTER 20 Clipper Road W. Conshohocken, PA 19428

EMCABS



by William H. McGinnis

In this issue we continue publishing abstracts of papers from previous EMC Symposia, other conferences, meetings and publications. The EMCABS committee is composed of the members listed below. By way of introduction to the community, they are listed with their company affiliations:

Mike Crawford, National Bureau of Standards Bob Hunter, Texas Instruments R. M. Showers, University of Pennsylvania Tasuku Kakagi, Tohoku University, Japan Daniel Kenneally, Rome Air Development Center Diethard Hansen, Asea Brown-Boveri, Switzerland

"HOW CAN I GET A COPY OF AN ABSTRACTED ARTICLE?" The answer to this frequently asked question follows:

Most large public libraries, some small public libraries, all engineering school libraries and most other college or university libraries have copies of publications in which articles appear. If they happen not to have the desired publication, such libraries usually can obtain it or a copy of the article from other libraries or sources. Many company libraries, both large and small, also have such arrangements. Many articles are available from the National Technical Information Service (NTIS) and/or the Defense Technical Information Center (DTIC). To retrieve an article or publication containing an article abstracted in EMCABS, it is suggested that you contact your company library, a nearby engineering school library, a university library, or your municipal public library. If the library does not have the publication, go to the librarian, explain what you need and he or she will help you get the publication on loan, perhaps from another library or, for a nominal charge, from NTIS. If you have a Department of Defense contract, the contracting officer or your company librarian can help you get publications from DTIC. The information needed is contained in the EMC abstract heading.

| Electromagnetic Fields in Loaded Shielded Rooms E. Vanzura and J. W. Adams NIST, Boulder, CO Test & Measurement World November, 1987 ABSTRACT: Computer-controlled RF levels and installation of RF absorbing material can help smooth out electromagnetic field variations in shielded rooms. The amount, location, and size of RF absorber material required depend on the test volume's size and on field uniformity specifications. This paper discusses these trade-offs and includes field strength control, mapping the test field, test procedures used, and test results obtained both with and without RF absorbing loading. INDEX TERMS: Electromagnetic immunity testing, partial absorber loaded shielded enclosures | | High Frequency Electric Field Probe Development J. Randa, ¹ M. Kanda, ¹ D. Melquist, ¹ R. Sega, ² J. Norgard ² NIST, Boulder, CO, ¹ Electrical Engineering Dept., University of Colorado, Colorado Springs, CO ² EMC Expo 88 Proceedings Washington, DC, May, 1988 ABSTRACT: Various designs have been considered for electric-field probes for the frequency range 26-110 GHz. A fiber optic temperature sensor to detect the heating of a resistive strip was designed, built, and tested. With its increased sensitivity, this design may be capable of operating throughout this range. INDEX TERMS: High frequency electrical field measurements, E-field probe, fiber optic sensor | | | |
|--|---|---|---|--|--|
| Automated TEM Cell for Measuring Unintentional EMCABS: 02-10-89 EM Emissions M. T. Ma and W. D. Bensema NIST, Boulder, CO EMC Expo Proceedings San Diego, CA, May, 1987 ABSTRACT: This paper summarized the basic electrical properties of a transverse electromagnetic (TEM) cell and its underlying theory. Based on these insights, the authors explain the use of a TEM cell to measure accurately the emission of an unknown, unintentional leakage source. The theory and measurement are verified by the results of a simulated example and by two experiments using a spherical dipole radiator and a small loop antenna. Recent development of an automated measurement system is also included. INDEX TERMS: Automated measurement, EM emissions measurements, TEM cells | | Aircraft Field Degradation and Electromagnetic Compatibility K. H. Cavcey and D. S. Friday NIST, CO NBSIR NBSIR 88-3083, January 88 ABSTRACT: This report discusses the first tests studying the problem of field degradation in Army aircraft - viz helicopters and one fixed-wing airplane - caused by the deterioration of electronic and electrical systems. The electromagnetic compatability (EMC) of these systems was investigated by passive measurement of the aircraft as a collection of radio frequency sources. Methods for detection of these sources were developed. These methods were sensitive to both stationary and nonstationary noise. INDEX TERMS: Electromagnetic compatibility, data acquisition, noise sources | | | |
| Electromagnetic Fields Radiated by Electrostatic Discharge M. T. Ma NIST, Boulder, CO ISEM 89 ISEM 89 Proceedings ABSTRACT: This paper examines the importance of accurate estimation fields radiated by electrostatic discharges (ESD). Analytical and experin a simple theoretical model on a specific measurement system, are preser modeled as an electrically-short, time-dependent linear dipole situated a plane. The measurement system consists of a newly-developed, broadb antenna, a wideband digitizing oscilloscope, and a desktop computer. INDEX TERMS: Electrostatic discharges, radiated electric field, radiated domain technique | EMCABS: 03-10-89 n of the electromagnetic nental results, based on nted. The ESD spark is bove an infinite ground and, time-domain, horn ed magnetic field, time- | TEM-Driven Reverberating Chamber Design Concept Study - A Single Facility for Large System Radiated EMC Testing 10 kHz - 40 GHz M. L. Crawford National Institute of Standards & Technology, Boulder, CO EMC Expo 89 Proceedings EMC Expo, Washington, DC, August 1989 ABSTRACT: Researchers at the National Institute of Standards and Tec develop a single, integrated facility using a large, shielded enclosure conf mission line-driven reverberating chamber. TEM test fields are generate multimode cutoff, and mode-stirred test fields are generated at freque cutoff. The paper discusses a proposed design, its advantages and lim basis for the concept, and the proposed experimental approach for evalu- of a large enclose with a test volume of 8m x 16m x 30m. INDEX TERMS: EMC measurements, reverberating chamber, TEM cel | EMCABS: 06-10-89 chnology are working to igured as a TEM trans- ed at frequencies below encies above multimode hitations, the theoretical ating a 1/10 scale model 1 | | |

| Limits and Methods of Measurement of Radio Interference Characteristics of Household Electrical Appliances, Portable Tools, and Similar Apparatus | EMCABS: 07-10-89 | Guide to Voltage Fluctuation Limits for Household Appliances (Relating to IEC Publication 555-3) International Electrotechnical Commission | EMCABS: 10-10-89 | | |
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| International Electrotechnical Commission 3, rue de Varembe, P.O. Box 31 1211 Geneva 20, Switzerland <i>CISPR Publication 14</i> , 1985, 99 pp. | | 3, rue de Varembe, P.O. Box 131 1211 Geneva 20, Switzerland CISPR Publications 827, 1985, 23 pp. | | | |
| ABSTRACT: For various kinds of household appliances, limits of radio- terminals and auxiliary leads are formulated. Measurement methods fo and discontinuous interference (clicks, switching operations) are given. | interference on the mains r continuous interference An artificial V-network | ABSTRACT: IEC Publication 55-3: Disturbances in Supply Systems Caused by Household Appli- ances and Similar Electrical Equipment, Part 3: Voltage Fluctuations, published in 1982, had specified limits for the voltage fluctuations which might be produced by an individual appliance and had given methods of test and calculation. | | | |
| is used for measuring the interference power. A interpretation of the in for type tests and for statistical measurements of appliances in large sca four appendices which list explanations and examples. A number of figu easy to read and handy to use. INDEX TERMS: Appliances, emission limits, emissions measurements | terference limits is given le production. There are res make this publication | This subsequent (1985), comprehensive report explains how the limits and test methods were developed and the way in which they should be used. Following a review of the need for voltage regulation limits, this report goes on to detail the background for each of the clauses in the <i>Standard</i> . INDEX TERMS: Appliances, limit calculations, emission limits, voltage fluctuations | | | |
| Limits and Methods of Measurement of Radio Interference Characteristics of Household Electrical Appliances, Portable Tools, and Similar Electrical Apparatus, Amendment No. 1 | EMCABS: 08-10-89 | Radio Interference Characteristics of Overhead Power Lines and High-Voltage Equipment International Electrotechnical Commission | EMCABS: 11-10-89 | | |
| International Electrotechnical Commission 3, rue de Varembe, P.O. Box 131 1211 Geneva 20, Switzerland CISPR Publications 14, 1985, 12 pp. | | 3, rue de Varembe, P.O. Box 131 1211 Geneva 20, Switzerland CISPR Publications 18-1, 1982, 105 pp. | | | |
| ABSTRACT: This amendment (see EMCABS: 07-10-89) covers limits ference and provides revised tables of limits when peak and average number of revisions to the original text are included. INDEX TERMS: Appliances, emission limits, emission measurement | for narrow band inter- detectors are used. A | ABSTRACT: This informative publication concentrates on the generation and characteristics of radio noise from ac power lines and from equipment operating at 1 kV and above in the frequency ranges 0.15 MHz to 30 MHz (a.m. sound broadcasting) and in the frequency ranges of 30 MHz to 300 MHz (f.m. sound broadcasting and television). The special aspect of spark discharges caused by bad contacts is also taken into account. Other information includes the interference caused by dc overhead lines for which corona and interference conditions differ from those of ac power lines. Interference caused by the current collecting equipment of overhead railway traction systems is not included. INDEX TERMS: Power lines, overhead lines, high-voltage lines | | | |
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| Revised International Standards for Limits and Methods of Measurement of Radio Interference Characteristics of Fluorescent Lamps and Luminaires | EMCABS: 09-10-89 | Interference Limits for Industrial, Scientific, and Medical Equipment International Electrotechnical Commission 3, rue de Varembe, P.O. Box 131 | EMCABS: 12-10-89 | | |
| International Electrotechnical Commission 3, rue de Varembe, P.O. Box 131 1211 Geneva 20, Switzerland CISPR Publications 15, 1985, 47 pp. | | 1211 Geneva 20, Switzerland CISPR Publications 23, 1987, 25 pp. ABSTRACT: This report reviews the CISPR position on limits for protecting telecommunications | | | |
| ABSTRACT: This revised publication gives both limits and measuremen application concerning the radio interference of fluorescent lamps and tion is limited to the frequency range from 150 kHz to 1605 kHz as important part of radio interference caused by fluorescent lamps. This measurement of self-ballasted fluorescent lamps and of luminaires, whother topic covered is the interpretation of test results on a stat interpretation for large scale productions. An added dimension is the demonstrate topic distributes and allow the results of the distribute about allow the result of the result of the function. | t methods for world-wide luminaires. The publica- nd thus covers the most edition includes both the with or without starters. tistical basis including scription of methods and pent | from interference caused by ISM equipment and clarifies the ways in which the CCIR (Inter- national Radio Consultive Committee) and the CISPR should collaborate in their studies on these limits. In addition to sections on the derivation and application of radio interference limits, the publication contains four appendices which contain a model for calculating limits, background information, an appraisal of the contemporary situation, and a summary of proposals for deter- mining the limits. INDEX TERMS: ISM, radio interference, limit calculation | | | |
| special tools, which should allow the reader to build his/her own equipment. INDEX TERMS: Emission limits, fluorescent lamps, emission measurement | | در د | 6 | | |

CALENDAR 1989

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Contact: Mr. W. Moron EMC Symposium Box 2141 Wroclaw 12, Poland Telephone: 48-42-41

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