



RELIABILITY GROUP NEWSLETTER

Paul Gottfried, Editor
Booz Allen Applied Research
Bethesda, Md. 20014

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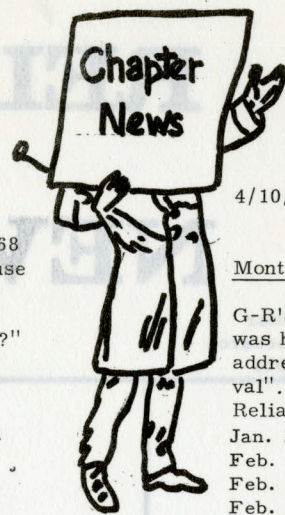
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Editor's Notes

In this issue, we present some additional information intended to encourage the strengthening of G-R by recruitment of new members and the formation of new chapters.

Your editor currently doubles in brass as chairman of the Washington chapter and is familiar with the frustrations of chapter officership; notably, the difficulties many chapters experience in getting the members to turn out for meetings. To quote Stephen Leacock: "The city in which I live is overrun with little societies, clubs and associations, always wanting to be addressed. So at least it is in appearance. In reality the societies are composed of presidents, secretaries and officials, who want the conspicuousness of office, and a large list of other members who won't come to the meetings." It is difficult to believe that G-R chapter officers are seeking conspicuousness -- most have been dragged into office kicking and screaming. It also is difficult to find out what would induce members to attend meetings: a survey of the Washington chapter last spring drew about a 30 percent response.

At the risk of incurring the wrath of the AdCom, some suggestions: By all means, the exploration of new-chapter possibilities is to be encouraged. Before deciding that the chapter is needed and wanted, find out how many G-R members are actively interested in meetings and how many pay the membership fee just to get the Transactions. When need and desire have been established, plan the program to complement the activities of other groups, not to compete with them. On subjects of general interest (but not broad enough for a Section meeting), schedule joint meetings with other Groups and other interested professional societies. Even in the quiet suburbs of Washington, D.C., a chapter meeting has to offer more than a way to get out of the house for an evening.



Baltimore

Recent reports cover two meetings held during the 1967-68 season. On November 27, 1967, A. Cucco of Westinghouse spoke on "Consumer Product Reliability in Action". On January 22, Dr. C. G. Green of Westinghouse discussed "Human Error and Machine Error -- Are They Different?"

Binghamton

At the September 23 meeting, P. W. Woodbury of General Electric presented a discussion on "Conservation of Material and Preservation of Lives". On October 21, P. O. Nerber of IBM spoke on "Warranty Cost Estimates for Avionic Systems".

Boston

Continuing a full schedule for the current season, the 1968 portion of which was announced in the October Newsletter, the Boston Chapter has planned the following:

- Feb. 20 Bayes Sampling Plans Dr. R. Schaffer
Hughes Aircraft
- Spring Lecture Series To be announced
- Mar. 20 Accelerated Life Testing Dr. N. D. Singpurwalla
Hughes Aircraft
- Apr. 24 All-Day Seminar To be announced

Canaveral-Daytona Beach

On September 12, Dr. L. W. Ball of Boeing presented a paper on "The Role of the Reliability Engineer in Systems Management".

Huntsville

The Huntsville Chapter was listed under "The Quiet Ones" in the July Newsletter as a result of a dearth of meeting reports. Reports recently received indicate that the Chapter had a busy 1967-68 season, indeed. Their calendar included:

- 9/28/67 Large Scale Integrated Circuits E. W. Massey
IBM
- 10/26/67 The Role of the Engineer in James Bain, Jr.
System Effectiveness Ohio State
- 11/20/67 Reliability Test To Failure H. J. Langlie
Philco-Ford
- 1/25/68 Reliability Assessment for E. J. Lytle, III
Management Federal Electric
- 2/29/68 Reliability of Electrical P. E. Sullivan
Support Equipment for the General Electric
Apollo Vehicle
- 3/28/68 Reliability Goal Allocations John Tuggle
IBM

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Second-class postage is paid at New York, New York.

4/10/68 Reliability Engineering Applied C. E. Heising
to Electric Utility Power Systems General Electric

Montreal

G-R's newest Chapter is off to a flying start. Its first meeting was held September 24, and Ernie Leitold of Canadian Marconi addressed the group on the subject of "Reliability Data Retrieval". The schedule for the season includes a four-lecture Reliability Training Session series:

- Jan. 28 Essentials of an Effective Reliability Program
- Feb. 4 Practical Aspects of Reliability Studies
- Feb. 11 Component
- Feb. 18 Failure Reporting and Analysis

Names of the speakers have not yet been announced. All sessions will begin at 7 p. m. and will be held at the Hydro Quebec Building; David Kiang (2442 Trenton Avenue., Montreal 16, 738-9441 Ext. 129) is Chapter Chairman and contact point for information. The chapter also plans a technical meeting March 18, possibly jointly with the Canadian Aeronautics and Space Institute.

New Jersey Coast

The joint G-R -- G-PMP Chapter heard J. P. Breickner of Fifth Dimension, Inc., at its October 16 meeting. Mr. Breickner spoke on "Testing and Packaging for Reed Relay Reliability".

Philadelphia

Please see "The Philadelphia Story" at the end of this section.

San Francisco

At its June 20 meeting, B. Croghan of Lockheed MSC addressed the chapter on "Parts Screening Techniques".

Washington

On October 16, R. Strauss of COMSAT discussed "Intelsat Communication Satellite Evolution". The Chapter sponsored a Washington Section meeting on November 12, at which "Computer-Aided Design" was debated by a panel consisting of Dick Granger, Keltec; Hal Jones, University of Maryland; Joe Mileta, Braddock Dunn & McDonald; and Bob Puttcamp, Harry Diamond Laboratories. A joint meeting with ASQC on November 20 was addressed by E. Codier of General Electric.

The Philadelphia Story

In honor of Jim Goodman, easily the most conscientious chapter Secretary in G-R, we publish his most recent submittal in full. Obviously, if every chapter provided as much news material we would be unable to publish it without condensation; equally obviously, we'd have a better Newsletter if more chapters had Jim Goodmans. Come on, you Secretaries, give him some competition for space!

I. Meeting Information

- A. Date: 4 February 1969
- Cocktail Hour: 6:00 P. M.
- Dinner: 7:00 P. M.
- Meeting: 8:00 P. M.
- Location: University of Pennsylvania
Faculty Club
Room B, 3rd Floor
36th and Walnut Streets
(Free Parking 37th & Walnut Sts.)
Philadelphia, Pennsylvania

Joint meeting of the Group on Reliability and Group on Aerospace and Electronic Systems.

Moderator: Dr. D. L. Birk, General Electric,
Missile & Space Division

Subject: Operational Aspects of Helicopter
Problems in Vietnam

Speaker: Mr. Paul Siegeman of the Boeing
Company, Vertol Division

A second speaker is in the process of being selected.

- B. Date: 12 March 1969
- Cocktail Hour: 6:00 P. M.
- Dinner: 7:00 P. M.
- Meeting: 8:00 P. M.
- Location: Presidential Apartments
The Madison House
City Line Ave. (U.S. Route #1)
and Presidential Blvd.
Philadelphia, Pennsylvania

Subject: "The Role of Reliability in
Systems Engineering"

Speaker: Mr. W. J. O'Leary, of RCA,
Missile and Surface Radar Div.

C. Failure Analysis Seminar

- Date: 22 May 1969
- Registration: 8:00 - 9:00 A. M.
- Sessions: 9:00 A. M. - 5:00 P. M.
- Luncheon: 12:00 noon - 2:00 P. M.

Seminar Chairman: R. E. Killion, RCA,
Missile and Surface Radar Div.,
Moorestown, New Jersey
Area Code 609 - 963-8000,
Extension PM 4428

Registration fee will include luncheon, proceedings,
and parking.

For information, registration and hotel reservations
contact:

Miss Helen B. Yonan
IEEE Office, Philadelphia Section
Moore School of E. E.
University of Pennsylvania
Philadelphia, Pennsylvania 19104
Telephone Area Code 215 - 594-8106
or 594-8134

II. Meeting Postscripts

A. The first meeting of the season on 17 September 1968 consisted of a panel discussion and seminar on the problems and techniques of subcontractor reliability control and coordination. Purchasing, Engineering and Supplier were represented on the panel moderated by Mr. Walt Ochsner of General Electric. Mr. Leo Landrey of Burroughs represented Engineering - Reliability, Mr. Joseph E. Questa of Questa and Co., Inc. represented the supplier and Mr. Dougherty of RCA represented Purchasing. A well attended meeting which resulted in extensive comments from the floor had to be terminated only due to the lateness of hour at nearly 11:00 P. M.

B. A panel discussion was featured on 16 October 1968 on the topic of "Computer Reliability Through Computer Software and the Software-Hardware Interfaces". A most knowledgeable group of panel members from the Auerbach Corporation who are consultants to industry and government in their respective fields sparked a lively discussion. Panel members, moderated by Mr. R. Brass of Auerbach, Inc., were the Messrs. J. Hildebrand, J. Brandstetter, and G. Cadwallader.

C. The last meeting of 1968 was held on 26 November 1968 on Micro Circuit Reliability. With the use of excellent slides, including some humorous ones, the topic was covered by two speakers from Philco-Ford. Mr. William Berger spoke on "Infrared Detection of Micro-circuit Failure Mechanisms" and Mr. Paul Rogers discussed "In-Process Control Techniques in Micro-circuit Manufacturing". The meeting proved to be one of the most interesting ones held this season, setting forth techniques directly applicable to users of micro-circuits in their incoming inspection or failure analysis activities.

III. Miscellaneous

In order to continue and enhance membership interest and increase meeting attendances a telephone squad has been placed in operation by Mr. J. Chalupa, Chairman Publicity Committee. A prize is in the offing to the squad member who achieves the largest number of attendees from his restricted list of members at his own company. Also the upgrading of present members is being pursued by the squad members at the same time. Squad members call their prospects one to two days prior to each meeting encouraging attendance. Flyers announcing each meeting continue to be sent to all members one to two weeks prior to the meeting date.

Hints & Kinks

Paul Gottfried
Booz, Allen Applied Research Inc.
Bethesda, Maryland

Every successful innovation in engineering in time becomes a routine tool. What once would have been seen as a challenge to the designer's ingenuity then turns into an exercise in leafing through handbooks in search of pat solutions.

This process of "maturation" is a necessary one; without it, the useful application of engineering knowledge would be limited by both the availability of talent and the cost of original work. In other respects, however, its consequences may be deadly. When it seems that all problems in a field have handbook solutions, the innovative engineer is driven to seek more fertile ground, and stock solutions are applied to problems to which the fit is far less than optimal. In time, the field may become a backwater of obsolescent technology.

It may be this process that is responsible for the bad light in which engineering is seen in the context of the modern city and its transportation problems. The current cry calls for involving the sociologist and the artist -- and any other non-technically oriented specialist -- in teams to define the paths, form, and appearance of roads and mass-transport systems. The engineer, roused from years in which innovation consisted of adding stainless steel in rounded contours to decades-old chassis or providing an extra half-inch of asphalt on existing sub-structures, finds himself trying to follow the dictates of the "experts" on aesthetics and urban utopianism. Is this because engineers as a group no longer are able to mold technology to social needs, or simply because the innovative engineers long ago went elsewhere?

Our own field of reliability engineering shows signs of reaching the stage at which the handbook viewpoint becomes dominant. Most of the mathematical theoreticians have gone out of sight in a maze of abstract models and refinements far removed from the world of obtainable data. Some of our physicists are doing worthwhile work in fundamental processes, which can form the basis for

engineering but does not constitute engineering. In the meantime, technical clerks grind numbers through formulas while junk continues to flow from the production lines. Are we heading for sterility, and if so can we halt the process?

These are gloomy thoughts, but the intent of their publication is not to spread doubt or despair. Much remains to be done in reliability, by engineers and others. On the one hand, we are in need of advances of the kind identified recently, in these pages, by the Advanced Technique Committee. On the other, enough solid progress through application of existing techniques has been demonstrated -- as in the history of spacecraft and the concurrent growth of complexity and reliability in data processing equipment -- to show that real benefits from reliability engineering are possible. If we can convince our managements and customers, in government and in the civilian economy, that support of technology advancement is not a luxury to be postponed in the hope of looser budgets and that application of existing technology to commercial products can yield near-term payoffs, we will find that more than enough challenge remains to keep our field active and interesting for many years to come.



Conferences

February 19-21	1969 IEEE International Solid State Circuits Conference, Sheraton Hotel, Philadelphia	May 19-21	1969 National Aerospace Electronics Conference (NAECON), Sheraton-Dayton Hotel, Dayton, Ohio
March 24-27	1969 IEEE International Convention, New York Hilton Hotel and Coliseum	June 16-21	Fourth Congress of the International Federation of Automatic Control, Warsaw, Poland
April 15-18	1969 Conference on Computer Aided Design (IEE, IERE, IME, IEEE, University of Shouthampton), Hampshire, England	June 22-27	1969 IEEE Summer Power Meeting (Theme: RELIABILITY), Sheraton-Dallas Hotel, Dallas, Texas. Manuscript Deadline February 15, IEEE Headquarters
April 16-18	1969 International Geoscience Electronics Meeting, Marriott Twin Bridges Motel, Washington, D. C.	June 30-July 4	Conference on the Application of Operational Research to Reliability, organized by the NATO Advisory Panel on Operational Research under the aegis of the NATO Science Committee, Turin, Italy. Registration deadline May 1. For details, contact Mr. E. M. Scheuer, The Rand Corporation, 1700 Main Street, Santa Monica, California 90406.
April 23-25	Southwestern IEEE Convention & Exhibition (SWIEEEO), San Antonio, Texas	July 7-11	1969 IEEE Annual Conference, Nuclear and Space Radiation Effects, co-sponsored by IEEE/G-NS and Pennsylvania State University, University Park, Pennsylvania. Summary deadline February 17, E. A. Burke, AFRL (CRWH) Stop 30, L. G. Hanscom Field, Bedford, Massachusetts 01730.
April 30-May 2	1969 Electronic Components Conference (IEEE, EIA), Washington, D. C.		
May 5-8	1969 IEEE (3rd) International Congress on Instrumentation in Aerospace Simulation Facilities, Polytechnic Institute of Brooklyn Graduate Center, Farmingdale, New York		
May 5-7	1969 Electrical and Electronic Measurement and Test Instrument Conference (EEMTIC & IM), Ottawa, Canada		

Short Courses

Newsletter policy with respect to short-course announcements, as established by the AdCom, is to provide publication for information only. No endorsement is implied, and no check on course content or instructor qualifications has been accomplished.

University of Wisconsin

Statistical Experimental Design: February 25-26, Madison campus. Two days, \$70.00. Write: Prof. William W. Wuerger, Institute Director, 725 Extension Building, 432 North Lake Street, Madison, Wisconsin 53706

Technology Forecasting Institute, Inc.

State-of-Art Lectures -- Nondestructive Testing, Quality Assurance. February 20-21, Biltmore Hotel, New York City; April 17-18, Hotel Intercontinental, Geneva. Two days, \$200.00. Write: Technology Forecasting Institute, 150 Fifth Avenue, New York, New York 10011

IEEE

Computer Programming for Electrical Engineers: January 23-24 (following Reliability Symposium), February 14-15 (following AES WINCON), March 27-28 (following IEEE International Convention), April 24-25 (following SWIEEEO); also (tentatively) April 17-18 (following INTERMAG). Two days; fees not stated in release. Write: Education Registrar, IEEE, 345 East 47th Street, New York, New York 10017

Problem Solving for Electrical Engineers Using Time Shared Computers: as above.

Fellow Awards

Among the 127 IEEE members advanced to Fellow grade as of January 1 are the following G-R members:

Alfred F. H. Bischoff, Daytona, "For technical contributions to loran, nuclear weapons, and Apollo reliability, and for inspirational leadership in personnel technical growth."

Louis J. Libois, France, "For contributions to the application of computers to telecommunications and to the progress of microwave links."

John C. McAdam, San Fernando Valley, "For original and continued engineering accomplishment in the field of heat dissipation, leading to greater reliability of electronic equipment."

Wolfgang J. Poppelbaum, Central Illinois, "For significant contributions in computer hardware design and in graduate education."

Cornelis J. D. M. Verhagen, Benelux, "For contributions to the development of interest and education in the field of instrumentation and control."

Personalia

Richard M. Jacobs has been appointed Assistant Secretary for the International Electrotechnical Commission TC 56: Reliability of Electronic Components and Equipment. Dick has long been active in G-R affairs and has most recently been serving as Treasurer.

D. R. Earles is shown receiving the R. J. Armitage, Jr. Award of the Society of Logistics Engineers in this photograph "borrowed" from Raytheon's "The Missile Messenger". Don is with the Advanced Systems Program Office, Missile Systems Division, Raytheon Company, and is a member of the Boston Chapter, G-R. The award is made annually to recognize literary achievement in Logistics. (Also in photograph: J. C. Goodrum, R. J. Armitage, Jr., E. F. Rosholdt, J. L. Carpenter).



Plans were made for obtaining the signatures required on the petition. Multiple copies were made and an interested person in each company represented on the interested party list was given a copy upon which to obtain signatures.

In the succeeding years, the company representative idea continued to provide the best way the chapter has found to maintain communications, provide publicity, and encourage attendance at meetings. It is the usual practice for these representatives to send out local announcements in the company mail prior to each meeting. A reply coupon is attached with its return to the representative indicated. Just prior to meeting day, but with enough time left for meal reservations, he calls those who have not replied, and ascertains their intentions. This gives an opportunity for personal encouragement.

Incidentally, with the exception of the organizational meeting, all have included a dinner. Dinner is served at 7 P. M. with a half to three quarters of an hour social period preceding. Usually 3 or 4 more persons arrive as dinner is concluding and the actual meeting gets underway at 8 P. M. It runs for about an hour, with a question and answer period ensuing. Cutoff is usually 9:30, but some particularly interesting programs have been hard to close at 10:00.

For the record, four technical meetings were held the year 1963/1964 with an average attendance of 40 members and guests, and an official group enrollment of 37 as of August 17, 1963.

A set of Bylaws were specifically tailored for the chapter in July, 1964, and they were, with minor changes, approved by the administrative committee.

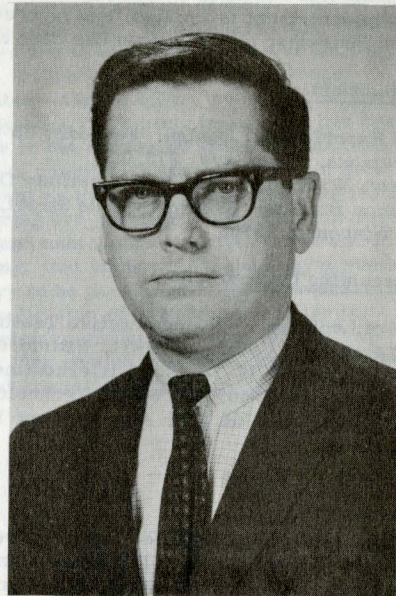
MEET YOUR ADCOM

Joe Naresky, Chairman of the G-R Reliability Definitions and Standards Committee, is Assistant Chief of the Engineering Division, Rome Air Development Center, Air Force Systems Command. He received his BA in Physics, summa cum laude, from Syracuse University and the MME degree from the same school. He is engaged in additional studies in Engineering Administration.

Joe has been working in military electronics since 1941, in military and civilian capacities. He is currently responsible for planning and directing the technical aspects of RADC efforts in microelectronics, reliability, maintainability, system effectiveness, site hardening and survival, data presentation and display techniques, and electronic security devices.

He has written and presented numerous technical papers on reliability technology and prepared the reliability sections in the *Encyclopedia of Electronics* (Reinhold, 1962) and the *Industrial Engineering Handbook* (2nd Edition, McGraw-Hill, 1963). He is a member of Sigma Pi Sigma, a Senior Member of IEEE, and an Associate Fellow of AIAA, and serves as a member of the AIAA Committee on Reliability and Maintainability.

Joe, his wife Jean, and their four children (Michael, John, Laura, and Steven) make their home in Rome, New York.



J. J. Naresky

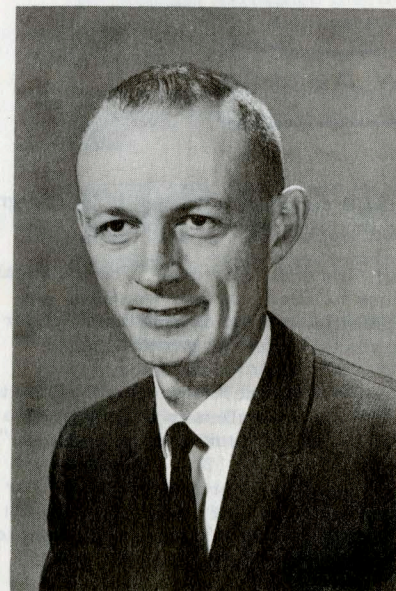


Harry Reese has served on the Administrative Committee since 1964, first as Treasurer and since 1966 as Vice Chairman for Technical Operations. He is Manager, Requirements and Integration, Mission Assurance Programs in General Electric's Space Systems Organization in Valley Forge, Pennsylvania. He received his BSEE from Tufts University and his MS in Statistics from Villanova University.

Having worked in most facets of the Annual Reliability Symposium Management Committee over the past ten years, Harry was General Chairman of the 1968 Symposium in Boston and is now Chairman of the Board of Directors. He has been Chairman of the Philadelphia Chapter G-R and is a member of AIAA.

At Philco, Burroughs, and General Electric Harry has several times exchanged reliability responsibilities for equipment engineering and parts engineering.

He is sometimes known as "the" Lil Reese's husband. They live with their three children in rural Charlestown, Pennsylvania, where he enjoys the local politics of the township Planning Commission.



H. E. Reese



Reliability Membership

G-R membership has been growing and has reached the point where there is potential for a number of new chapters. This is clearly indicated by the "Reliability Statistics" in the following table:

Section	Number of Members
Syracuse	23
Dayton	39
S. E. Michigan	20
Milwaukee	25
Dallas	45
St. Louis	28
Phoenix	23
Tokyo	76

Information on how to form a new chapter in your area may be obtained by writing to Mr. V. R. Monshaw, Vice-Chairman of Meetings, Chapters, and Membership, RCA/Astro Division, Box 800, Princeton, New Jersey. In addition, the article below on how the Baltimore Chapter was founded should provide you with good ideas in this area.

"A Professional Group Chapter on Reliability Emerges on the Shores of Chesapeake Bay"

The Baltimore Chapter, Professional Group on Reliability, came into actual being at an organizational meeting held at the Westinghouse Defense and Space Center September 23, 1963. The twenty-two persons in attendance elected a chairman, vice-chairman, and secretary/treasurer. Floyd Wenger of the Air Force Systems Command and a long time resident of the Baltimore-Washington area was the invited speaker who gave the officers and members present many words of wisdom derived from his earlier experiences in organizing the Group on Component Parts in Baltimore and his contacts with other groups. He was then on the Executive Board of the Washington Group on Reliability.

Among his good recommendations were admonitions to stay away from narrow technical subjects, sticking to matters of wide general interest and a caution against having too many meetings. Four to five per year was considered the ideal. Baltimore's first technical program was held in the month following, on October 28, 1963, with 28 present.

Behind this successful launching lay a bit of advance planning, approvals, and publicity dating back to February, 1963. Exact details have been lost with the passing of years and transfer of files from secretary to secretary, only one piece of correspondence coming to light. That was a copy of the "Call for Interest" questionnaire dated March, 1963, and sent out to all Baltimore IEEE section members by Headquarters at the request of R. L. Williams, the organizer.

It seems that back in early February he and one of his co-workers at the Westinghouse Aerospace Division in Baltimore were discussing the desire for a local professional group chapter and wondering why someone had not promoted one. Taking the attitude that there ought to be one and that someone must start, Williams called Doctor Willis C. Gore, at Johns Hopkins University, who was then the Baltimore section chairman and inquired if any plans were underway for a chapter and if not, did he think there would be interest in starting such a chapter.

Doctor Gore indicated that as far as he knew, no action had been taken, but he thought it would be a good idea. He suggested that the administrative committee of the section would be meeting in a couple of days and if a request were in his hands at that time he would bring it before the meeting and attempt to get the necessary approval. Having this approval, the organizer could then poll the local membership, obtain signatures of at least 12 IEEE members who were or who promised to become group members, and submit the petition to National Headquarters for approval to form a chapter.

The approval of the local section was promptly given, the interest questionnaire sent out from New York, and some forty or fifty returns were received. Of these, only 2 or 3 indicated opposition to establishing a chapter, so adequate backing was felt to exist to support a petition.

Reliability Definitions Status

A listing of 63 definitions of Reliability terms, submitted for inclusion in the proposed IEEE Dictionary of Electrical and Electronic Terms, was published in the April 1968 Newsletter. Approximately 40 additional terms, primarily covering the area of Maintainability, are to be considered early this year, along with some 10 additional terms proposed by Technical Committee #56 of the International Electrotechnical Commission. Chairman Joe Naresky of the Reliability Standards and Definitions Committee (G-R) hopes to submit the final list of approximately 100 terms to the IEEE Standards Committee by 1 July, for publication as an IEEE Standard.

More on CADAR

The Computer Aided Design, Analysis, and Realizability Committee (CADAR) operates under an IEEE charter limiting it to not more than 20 Institute members appointed by the Chairman of the Technical Activities Board (TAB). CADAR's function is to identify, collect, and disseminate periodically to members of the Institute, information concerning computer programs, meetings, seminars, training courses, book reviews, abstracts and similar material. The objective is the promoting of the effective utilization of computers in the design, analysis, and realization of electrical and electronic systems, devices, and circuits.

As previously announced, publications prepared by CADAR -- including the bimonthly CADAR NEWS -- will be distributed to IEEE members on request. Substantial commonality of interests with G-R suggests that many members will want to take advantage of this opportunity.



Chapter Chairmen

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(address unknown)

Mr. P. E. Nickerson (Past Chairman)
General Precision Inc.
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1370 Encinatas Road
San Marcos, California

Symposium Committee Meeting

The IEEE was well represented at a recent meeting in Chicago, Illinois, of the Board of Directors, Advisory Board, and Management Committee of the 1969 Annual Symposium on Reliability. The 1969 Symposium will be held January 21, 22, and 23 at the Palmer House, Chicago, Illinois. Attending, from left to right, were:

Back Row: H. D. Hulme, Westinghouse Electric Corporation (1969 General Chairman); V. R. Monshaw, Radio Corporation of America (Chairman Elect for the 1970 Symposium); E. F. Jahr, IBM Corporation (IEEE representative on the Board of Directors); Dr. R. A. Evans, Research Triangle Institute (Chairman, Registration Committee); and H. E. Reese, General Electric Company (Chairman, Board of Directors).

Front Row: L. Paddison (representing R. W. Henderson, Sandia Corporation, member of the Symposium Advisory Board); P. K. McElroy, Consultant (Chairman, Proceedings Committee); and M. P. Smith, Honeywell Corporation.

Messrs. E. F. Jahr, H. E. Reese, and M. P. Smith are Symposium Past General Chairmen.

