### **50-Year History Supplement**

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Advancing the Practice of Electrical & Electronics Engineering in Industry

**IEEE Industry** 

# A Celebration of 50 Years





MAGAZINE













# IEEE Industry MAGA7INF

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Scope: IEEE Industry Applications Magazine publishes technical articles on the development and application of electrical systems apparatus devices and controls to the pro-cesses and equipment of industry and commerce the promotion of safe reliable and economic installations the encouragement of energy conservation and the creation of voluntary engineering standards and recommended practices. IEEE Industry Applications Magazine includes technical articles as well as new standards education information announcements of conferences workshops committee meetings and reports of IEEE Industry Applications Society activities.

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IAS organization | blake lloyd

# Happy Anniversary, IAS!

W

ith the support of several IEEE Industry Applications Society (IAS) members, past presidents, and the

2014 Executive Board, IAS Memberat-Large Tamas Ruzsanyi has spearheaded an effort to capture the last 50 years of IAS history. Together with these colleagues, he has prepared this historical special issue for you to enjoy and share with your peers, family, and the engineering community. I hope you find it interesting as we tried to capture the essence of those who were impacted by, and contributed to, the development and accomplishments of the IAS. This document supplements A History Update of the IEEE Industry Applications Society, written in 1995 for the 30th anniversary of the IAS by then President Barry Brusso, which is included on pages 94-140 of this issue.

Now, in January 2015, the Society will celebrate our 50th anniversary. In fact, the IAS has a long tradition that predates even the formation of the IEEE. Before the Society was formed, many of its technical committees were associated with the Industry Division and General Applications of the American Institute of Electrical Engineers (AIEE). On 1 January 1963, the IEEE was formed. The various AIEE technical communities were brought together as the IEEE Industry and General Applications (IGA) Group on 1 January 1965

under the first IAS president, Robert B. Moore. The name was simplified, and the IGA Group became the IAS on 1 January 1972.

The formation of the IAS began a significant maturity of technical excellence for our industry. This special issue provides a way to honor the dedicated members who contributed their time and expertise for the benefit of the Society and their peers. One longstanding tradition of the IAS has been the Annual Meeting, which was first held in Chicago, Illinois, in 1966 and has since been held in various international locations, such as Rome and Hong Kong. Other significant IASsponsored conferences include the IEEE Applied Power Electronics Conference and Exposition (APEC) and, more recently, the IEEE Energy Conversion Congress and Exposition (ECCE) America. One very unique aspect of the Society and our activities is the ability to link research to practice, and conferences are an ideal opportunity to bring academics and researchers together with practicing engineers to solve the technical issues of the day.

Over the years, our departments and technical committees have transitioned to match the changing needs and focus of industry. For example, the original Industrial Utilization Systems Department later

### THE VISION OF THE IEEE INDUSTRY APPLICATIONS SOCIETY

...to be a world leader in the advancement of technology and dissemination of technical information to support professionals engaged in the applications of electrical and electronic engineering to industry.

### **Field of Interest**

The scope of the IEEE Industry Applications Society (IAS), as a transnational organization, is the advancement of the theory and practice of electrical and electronic engineering in the development, design, manufacture, and application of electrical systems, apparatus, devices, and controls to the processes and equipment of industry and commerce; the promotion of safe, reliable, and economic installations; industry leadership in energy conservation and environmental, health, and safety issues; the creation of voluntary engineering standards and recommended practices; and the professional development of its membership.

The functions of the IAS are to promote close cooperation and exchange of technical information among its members and those of other Societies and groups and committees of IEEE, to hold meetings for the presentation and discussion of papers, and to provide for the needs of its members by stimulating research, initiating and developing voluntary engineering standards and recommended practices, and sponsoring periodical and special publications.

2

became the Manufacturing Industries Department and is now called the Manufacturing Systems Development and Applications Department. In recent years, several new technical committees, including those on safety, transportation systems, and renewable and sustainable energy conversion systems, have been formed. New technologies have also created overlap in fields of interest within IEEE Societies, and IAS participates in many joint activities with our sister Societies, including conferences, publications, and standards. In addition to Transactions on Industry Applications (established in 1966) and IEEE Industry Applications Magazine (established in 1995, replacing the Society newsletter), we now cosponsor five other transactions and magazines.

Some awards established by the Society over the years include the Outstanding Achievement Award in 1969, the Distinguished Service Award in 1988, and the Andrew W. Smith Outstanding Young Member

Award in 1996. In 1988, the Zucker Travel Program, which focuses on student member development, was established. The IAS now has over 200 Chapters covering all ten IEEE Regions, of which 70 are Student Branch Chapters. Some of the early

successes of the IAS were in the area of standards. The *Color Books*, first developed in the late 1980s, are still active standards and are undergoing a significant facelift

over the next few years. The IAS supports about 75 of the approximately 1,300 IEEE standards in use and will certainly be active in standards for new technology areas like transportation and renewables.

THE FORMATION OF IAS BEGAN A SIGNIFICANT MATURITY OF TECHNICAL EXCELLENCE FOR OUR INDUSTRY.

I sincerely hope you find this special issue of IEEE Industry Applications Magazine interesting and enlightening. The IAS leadership has continuously attempted to provide value for our membership by supporting the best quality programs and publications within the most economical package. I am sure the IAS will continue to grow in both membership and status in the next 50 years because of the dedication

of the volunteer membership who work so diligently on our behalf.

IAS





IAS organization

# Governing Structure and Basic Organization



he organizational structure, the scope of activity, and the governing procedures of the IEEE Industry Applications

Society (IAS) are defined in the IAS constitution (the highest level of governance for the Society) and the bylaws in detail. The IAS governing structure is shown in Figure 1.

The highest level of governance is the Society Council. The council meets annually and is empowered to elect the officers of the Executive Board, ratify amendments to the constitution, and establish major policy for the Society. The technical committee and area chairs may not be aware of their position on the council and the need for them to vote on council issues. The council is, in effect, the boss of the Society.

The Executive Board of the Society is empowered to change bylaws and policy and procedures. The board has officers (president, president elect, vice president, and treasurer), standing committees, technical departments, and operating departments.

Standing committees are established or abolished through the recommendations of a specially structured ad hoc committee appointed by the president. The standing committees include the Constitution and Bylaws, Electronic Communication, Financial Planning, Intersociety



The IAS governing structure.

Cooperation, Long-Range Planning, and Nominating Committees.

Operating departments are units of the Society organized to improve the administration or operational effectiveness of the Society and include Awards, Chapters and Membership, Education, Meetings, Publications, and Standards.

There are four technical departments, and each is composed of several technical committees. These technical committees are responsible for the solicitation and selection of papers for presentation at IEEE meetings and for the grading and recommendation regarding publication in IEEE Transactions on Industry Applications and IEEE Industry Applications Magazine or other IEEE publications. The technical committees are also responsible for the initiation, preparation, and formulation of standards, specifications, operating and application guides, test procedures, and recommended practices for issue, in accordance with IEEE regulations. They provide technical assistance to Chapters formed within their respective scope. The details of the Society structure are shown in Figure 2.

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### The organization of the IEEE IAS.

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**IAS** organization

# The Society's 2015 Executive Board

SOCIETY OFFICERS				
President David B. Durocher (Region 6)	President Elect Tomy Sebastian (Region 4)	Vice President Georges Zissis (Region 8)	Treasurer Massimo Mitolo (Region 6)	
	TECHNICAL DEPARTM	/IENTS		
Manufacturing System Development and Application Donald Zinger (Region 4)	Process Industries John Kay (Region 7)	Industrial Power Con- version Systems Avoki M Omekanda (Region 4)	Industrial and Commercial Power Systems Wei-Jen Lee (Region 5)	
	OPERATIONS DEPART	MENTS		
Awards Mohammad S. Islam (Region 4)	Chapters and Membership Peter Magyar (Region 8)	Education Ibaq Huessin (Region 3)		
Meetings R. Mark Nelms (Region 3)	Publications Ahmed Rubaai (Region 2)	Standards S. Mark Halpin (Region :	3)	
	STANDING COMMITTEE	CHAIRS		
Constitution and BylawsElectronic CommunicationsFinancial PlanningThomas Nondahl (Region 4)Clifton Oertli (Region 5)Massimo Mitolo (Region 6)				
Inter-Society Cooperation Uday Deshpande (Region 3)	Long-Range Planning Tomy Sebastian (Region 4)	Nominating and Appointment Blake Lloyd (Region 7)		
	MEMBERS-AT-LARC	<del>JE</del>		
J. Marcos Alonso (Region 8)	A.J. Marques Cardoso (Region 8)	Po-Tai Cheng (Region 10)		
Tamás Ruzsanyi (Region 8)	nás Ruzsanyi John Malinowski Subrata Mukhopadhyay egion 8) (Region 5) (Region 10)		, ,	
Gustavo Ramos Lopez (Region 9)	David Eng (Region 6)	Corinne Fields (Region 5)		
EX-OFFICIO AND SISTER SOCIETY LIAISONS				
Past President Blake Lloyd (Region 7)	IEEE Division II Director Jerry Hudgins (Region 4)	PES/IAS Liaison Position vacant		
PELS/IAS Liaison Enrico Santi (Region 3)	IES/IAS Liaison Gerard Capolino (Region 8)	DEIS/IAS Liaison Hulya Kirkici (Region 3)		

NOTE: The board member's home region is indicated in parentheses.

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**IAS** organization



# The **Operating** Departments

### **OPERATING DEPARTMENT CHAIRS**

1995-1997

1965–1966	Thomas M. Linville	1998–2000
1966–1968	Eugene W. Boehne	2000-2004
1968–1970	Marco H. Sluis	2005–2008
1971–1973	F.A. (Tony) Furfari	2009–present
1974–1975	H. Paul Meisel	
1976	Bernard W. Whittington	Education Depa
1977	James H. Beall	1995–1999
1978	Carl A. Napor	2000-2001
1979–1980	John H. Karlson	2002-2006
1981-1982	John F. Blumenfeld	2007-2010
1983–1984	Randolph L. Houlton	2011-2014
1985–1986	Eugene J. Fagan	2015–present
1987-1990	C.L. Ivey	
1991-1993	William W. Weil	Meetings Depar
1994–1995	Paolo Tenti	1965–1968
		1969–1970
Awards Departi	ment	1971–1975
1996–1998	Robert D. Lorenz	1976–1984
1999	Nady Boules	1985
2000	Amy G. Frere	1986–1996
2001-2004	Clayton H. Reid	1997–2000
2005-2008	Adam Skorek	2001
2009-2012	Andrew Bagley	2002–2003
2013–present	Mohammad Islam	2004–2005
		2006–present
Chapters and M	lembership Department	
1968–1969	W.R. (Joe) Harris	Standards Depa
1969–1971	George W. Younkin	1977–1979
1972	John F. Cachat	1980–1982
1973–1974	John A. Hart	1983–1985
1975–1976	A. Malcolm Curry	1986–1989
1977–1978	John C. Ponstingl	1990–1993
1979–1980	Howard I. Hovman	1994–2000
1981-1982	Robert B. Voller	2001-2003
1983-1984	John F. Blumenfeld	2004-2007
1985–1986	Michael J. Foley	2008-2010
1987-1988	Beth M. Pack	2011

Caio A. Ferreira Kevin L. Peterson Mark Harris Sunita Kulkarni Peter Magyar

### rtment

R. Mark Nelms S. Mark Halpin Joseph Sottile Donald Dunn Joseph Sottile Iqbal Husain

### tment

Harold G. Frostick Alfred F. Leatherman B.C. (Bill) Biega George U. Messner Richard P. Genda Melvin J. Dold Stephen W. Hagemoen Thomas Novak Barry Brusso Steve Swencki R. Mark Nelms

### rtment

20

77–1979	Bernard W. Whittingtor
30–1982	Leonard S. Corey
33–1985	L.A. (Pete) Morley
36–1989	L. Bruce McClung
90–1993	Ben C. Johnson
74–2000	L. Bruce McClung
01–2003	Howard Wolfman
04–2007	Mike Hittel
08–2010	David Mills
11	L. Bruce McClung
12–present	S. Mark Halpin

(continued)

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Tom E. Kirsch

Barry C. Brusso

Wayne L. Quayle

**Administration Department** 

Date of publication: 10 December 2014

1988-1989

1990-1992

1993-1994

### **OPERATING DEPARTMENT CHAIRS** (continued)

### **Publications Department** Society Transactions Editors 1965–1972 Donald S Donald S. Brereton Donald S. Brereton

1705-1707	Donald 5. Dieleion	1/05-1/72	Donald 3. Dieleion	
1968–1969	Irvin N. Howell, Jr.	1973–1974	Robert Loewe	
1970–1971	John F. Cachat	1974–1983	Norman Peach	
1972	James E. Levett	1983–1996	Edward A.E. Rich	
1973	Boris Mokrytzki	1997–2006	Baldwin Bridger, Jr.	
1974	William L. Wachs	2007-2014	Carlton E. Speck	
1975	Edward A.E. Rich	2015–present	Thomas Nondahl	
1976	H. Paul Meisel			
1977–1978	Dale B. Cochran	IEEE Industry Ap	plications	
1979–1980	George W. Walsh	Magazine Edito	Magazine Editors	
1981–1986	Vincent A. Falvo, Jr.	1995–1998	John H. Kassebaum	
1987–1999	Michael J. Foley	1999–2004	Andrew W. Smith	
2000–2003	Carlton E. Speck	2005-2010	Louie J. Powell	
2004–2007	Mark Weaver	2011–present	H. Landis "Lanny" Floyd	
2008-2011	Kevin Peterson			
2012–present	Ahmed Rubaai	Society Organiz	Society Organization Manual and	
		Membership Dir	ectory Editors	
<b>IAS Publication</b>	Editors	1967–1970	Donald S. Brereton	
Society Newsler	ttor Editors	1971–1983	Donald S. Brereton	
1044 1047	Donald & Braratan		and Patricia E. Brooks	
1047 1074	Gerald C. Quipp	1984–1988	F.A. (Tony) Furfari	
107/ 1075	Ed Palko	1989–1998	Donald S. Brereton	
1075 1077	Phyllis Boall	1999	Donald S. Brereton	
1070 1001	Patricia E Prooks		and F.A. (Tony) Furfari	
17/0-1704	FUITCIU E. DIOOKS	1000,0000		

1999-2002

Steven A. Larson

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1045 1047

1984-1994

F.A. (Tony) Furfari



The history of the Operating Department.

IAS organization



# The Technical Departments

### **TECHNICAL DEPARTMENT CHAIRS**

### **Technical Operations Department**

1965–1967	Willard H. Dickinson
1968–1969	Robert A. Zimmerman
1969–1970	W.R. (Joe) Harris
1971-1972	Alfred F. Leatherman
1973	W. Herbert Bixby

### **Industry Operations Department**

1974Edward A.E. Rich1975–1976William L. Wachs

### **Technology Operations Department**

1974	Boris Mokrytzki	
1975–1976	Harold W. Rice	
Process Industries Department		

1977	Carl A. Napor
1978	Samuel P. Axe
1979	Richard L. Curran
1980–1981	Al M. Newcome
1982	L.A. (Pete) Morley
1983–1984	Eugene J. Fagan
1985	David Victor
1985–1986	C.L. (Curt) Ivey
1987–1989	M. Dayne Aldridge
1990-1991	C.P. (Robbie) Robinsor
1992-1993	Fred C. Trutt
1994–1995	Thomas Novak
1999-2001	H. Landis "Lanny" Floye
2002-2003	Bill W. McCarty
2004–2006	Clayton Reid
2007-2010	David B. Durocher
2011-2012	Roderick Simmons
2013-2014	Andrew Bagley
2015–present	John Kay

### General Industries Department

17//-17/0	Roben E. Sana
1979	John R. Flynn
1980–1981	C.D. Lambert

982–1983	Nic
984–1987	Wi
988–1989	Ste
990	Bru

### Nicholas E. Gatzios William W. Weil Steven E. Collier Bruce A. Jackson

### Industrial and Commercial Power Systems Department

Fower systems De	pariment
1977–1978	George W. Walsh
1979–1980	Derio Dalasta
1981-1982	M. Shan Griffith
1983–1984	James W. Patterson
1985–1986	Thomas E. Sparling
1987–1988	Baldwin Bridger, Jr.
1989–1990	Richard H. McFadden
1991-1992	Pat O'Donnell
1993–1994	John R. Cooper
1995–1996	David S. Baker
1997–1998	James M. Daly
1999-2000	Robert W. Ingham
2001-2002	Louie J. Powell
2002–2003	William J. Moylan
2005	Prafulla Pillai
2006	Carey J. Cook
2007-2008	Dan Neeser
2009-2010	Tom Baldwin
2011-2012	T. David Mills
2013–present	Peter Sutherland
Industrial Power C	conversion
Systems Departm	ent
1977–1980	David W. Borst
1981–1982	Victor R. Stefanovic
1983–1985	Loren F. Stringer
1986–1987	Linos J. Jacovides
1988–1989	Dale L. Ashcroft
1990–1991	Thomas A. Lipo
1991-1992	Thomas M. Jahns
1994–1995	Ira J. Pitel
1996–1997	Jerry L. Hudgins
1998-1999	Thomas A. Nondahl

(continued)

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### **TECHNICAL DEPARTMENT CHAIRS** (continued)

Industrial Power Conversion Systems Department (continued)		1992	Carlton E. Speck	
2000–2001	2000–2001 Frederick C. Brockhurst Manufacturing Industries Departm			
2002-2003	Rik W. De Doncker	1990–1992	William P. Jezo	
2004-2005	Tomy Sebastian			
2006-2007	Richard Lukaszewski	Manufacturing Sy	<i>/stems</i>	
2008-2009	Hamid Toliyat	Development an	d	
2009-2011	Giovanna Oriti	Applications Department		
2012-2013	Joseph Ojo	1993	Carlton E. Speck	
2013–present	Avoki Omekanda	1994–1995	Steven A. Larson	
		1996-1997	Akram Hossain	
Industrial Utilization		1998-1999	Paul I-Hai Lin	
Systems Departm	ent	2000–2001 Hiroaki Ikeda		
1977–1978	John H. Karlson	2002-2003	Adam Skorek	
1979–1980	Robert M. Yurkanin	2004-2005	Donald Zinger	
1981–1984	E.G. (Al) Kiener	2006-2007	Ahmed Rubaai	
1985–1987	Kao Chen	2008-2009	Malik Elbuluk	
1988–1989	Jon K. Edwards	2009-2011	David Kankam	
1990–1991	Mohammed Safiuddin	2012–present	Georges Zissis	



Technical department history.

IAS

IAS organization | peter magyar



# Society Chapters by Region



Chapters and Chapter chairs as of December 2014 are noted below.

### IEEE REGION 1 (NORTHEASTERN UNITED STATES)

Area Chair Hazem A. Huss

**Student Branch Chapters Area Chair** Ziqiao Liu (R1–9) Buffalo Section Joint Chapter PE31/IA34 Established 20 April 1966 *Chair:* Chris L. Mierzwa Buffalo, New York Connecticut Section Joint Chapter CS23/RA24/IA34 Established 2 June 2004 *Chair:* Biao Zhang Hartford, Connecticut Long Island Section Joint Chapter PE31/IA3 Established 18 June 2009 *Chair:* Louis D'Onofrio New York (continued)

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### IEEE REGION 1 (NORTHEASTERN UNITED STATES) (continued)

Maine Section Joint Chapter PE31/IA34 Established 2 May 1969 *Chair:* Brian D. Huntley Maine New York Section Joint Chapter PE31/IA34 Established 2 November 1966 *Chair:* Sharene Williams New York, New York North Jersey/Princeton— Central Jersey Joint Section Chapter IA34 Established 15 April 1980 *Chair:* Kenneth J. Oexle Princeton, New Jersey Rochester Section Joint Chapter PE31/IA34 Established 4 January 1968 *Chair*: David G. Krispinsky Rochester, New York

### Schenectady Section Chapter IA34 Established 10 February 1965 *Chair:* Abouzar Ghavami Schenectady, New York

Syracuse Section Joint Chapter PE31/IA34 Established 13 February 1968 *Chair:* Frederick J. Constance Syracuse, New York

### **IEEE REGION 2 (EASTERN UNITED STATES)**

Area Chair Andrew M. Novotny

**Student Branch Chapters Area Chair** Ziqiao Liu (R1–9)

### Delaware Bay Section Joint Chapter PE31/IA34

Established 24 May 1966 *Chair:* Gordon E. Lipscy Stephen Steffel Delaware

### Akron Section Chapter IA34 Established 25 August 1965 *Chair:* Richard L. Buchanan Akron, Ohio

### Northern Virginia/ Washington Joint Section Chapter IA34 Established 2 June 2005 *Chair:* Oscar Reyes Washington, D.C.

Baltimore Section Chapter IA34 Established 16 December 1964 *Chair:* Patrick Marquez Baltimore, Maryland

### Philadelphia Section Joint Chapter PE31/IA34 Established 26 February 1992 *Chair:* Michael W. Reynolds Philadelphia, Pennsylvania

Dayton Section Joint Chapter PE31/IA34/PEL35 Established 9 July 2

Established 9 July 2012 *Chair:* Xiaochuan Jia Dayton, Ohio

### Pittsburgh Section Joint Chapter

PE31/IA34 Established 10 February 1965 *Chair:* David J. Vaglia Pittsburgh, Pennsylvania

### IEEE REGION 3 (SOUTHERN UNITED STATES)

**Area Chair** Osama A. Mohammed

**Student Branch Chapters Area Chair** Ziqiao Liu (R1–9)

Central Tennessee Section Joint Chapter PE31/IA34 Established 28 June 2012 *Chair:* James R. Link Nashville, Tennessee Alabama Section Chapter IA34 Established 1 August 1972 *Chair:* Preston L. Jackson Jr. Auburn, Alabama

Eastern North Carolina Section Chapter PE31/IA34 Established 7 April 1975 *Chair:* Roger G. Lawrence North Carolina Atlanta Section Chapter 1A34 Established 19 October 1970 *Chair:* Peter O. Andersen Atlanta, Georgia

Florida West Coast Section Joint Chapter PE31/IA34 Established 15 June 1992 *Chair:* Serge Beauzile Florida

### Central Savannah River Section Chapter IA34 Established 29 September 2005

29 September 2005 *Chair: Mi*chael B. Rollins Georgia

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### IEEE REGION 3 (SOUTHERN UNITED STATES) (continued)

Jacksonville Section Joint Chapter PE31/IA34 Established 11 November 1996 *Chair:* Russel Simmons Jacksonville, Florida

### Memphis Section Joint Chapter PE31/IA34 Established 8 November 1989 *Chair:* Mohd H. Ali Memphis, Tennessee

### Miami Section Chapter IA34 Established 3 April 1978

Established 3 April 1978 *Chair:* Osama A. Mohammed Miami, Florida

### Miami Section, Florida International University Student Branch Chapter IA34

Established 16 November 2012 *Chair:* Mustafa Farhadi *Advisor:* Osama A. Mohammed Miami, Florida

### Orlando Section Joint Chapter PE31/IA34/PEL35 Established 3 April 1969

Chair: Ian D. Beason

Orlando, Florida

Western North Carolina Section Joint Chapter PE31/IA34 Established 28 February 2008 *Chair:* Stanley F. Frady North Carolina

### **Area Chair** Gary M. Waugh

**Student Branch Chapters Area Chair** Ziqiao Liu (R1–9)

Indiana University-Purdue University Indianapolis Student Branch IAS Chapter Petition approval in Progress *Chair:* Sally Sajadian *Advisor:* Ezueli dos Santos Indianapolis, Indiana

Southeastern Michigan Section Chapter PE31/IA34 Established 22 April 1974 *Chair:* Kevin J. Taylor Center Line, Michigan Chapter IA34 Established 20 July 1984 *Chair:* Walter C. Krieger Michigan

**Calumet Section** 

### Milwaukee Section Joint Chapter IE13/IA34 Established 21 April 1986 *Chair:* Tiefu Zhao Milwaukee, Wisconsin

Toledo Section Chapter 1A34 Established 21 October 1970 *Chair:* Gary M. Waugh Toledo, Ohio

### Nebraska Section, University of Nebraska-Lincoln Student Branch

**Central Indiana Section** 

Established 22 April 1964

Indianapolis, Indiana

**IEEE REGION 4 (CENTRAL UNITED STATES)** 

Chapter

PE31/IA34

Chair: Earl Hill

Chapter PE31/IA34/PEL35 Established 28 June 2012 *Chair:* Dingguo Lu *Advisor:* Wei Qiao Lincoln, Nebraska

University of Illinois at Urbana-Champaign Student Branch Chapter PE31/IA34/PEL35

Petition approval in progress Chair: Siming Guo Advisor: Philip T. Krein Urbana-Champaign, Illinois

### Chicago Section Joint Chapter

IE13/IA34 Established 16 March 1968 *Chair:* Brian Reinhardt Goldman Chicago, Illinois

### Rock River Valley Section Chapter IA34 Established 24 March 1992 *Chair:* Jalil Etminan Illinois

### IEEE REGION 5 (SOUTHWESTERN UNITED STATES)

**Area Chair** Sunita Kulkarni

**Student Branch Chapters Area Chair** Zigiao Liu (R1–9)

Denver Section Joint Chapter PE31/IA34 Established 10 September 1973 *Chair:* William J. Stoick Denver, Colorado

Houston Section, Texas A&M University Engr. Tech. Student Branch IAS Chapter Established 1 July 1994 *Chair:* Position Vacant

Oklahoma City Section Joint Chapter PE31/IA34 Established 27 July 1978 *Chair:* Robert A. Scolli Oklahoma City, Oklahoma Baton Rouge Section Chapter IA34 Established 5 December 1975 *Chair:* Lynwood W. Gordon Baton Rouge, Louisiana

### Denver Section, University of Denver Student Branch Chapter IA34

Established 2 December 2013 *Chair: Ziqiao Liu Advisor: Jun Jason Zhang* Denver, Colorado

Houston Section, Texas A&M University Student Branch Joint Chapter PE31/IA34/PEL35

Established 14 October 1998 *Chair:* Sinan Sabeeh Al-Obaidi *Advisor:* Robert Balog College Station, Texas

Saint Louis Section Chapter 1A34 Established 25 May 1965 *Chair:* Jonathan W. Kimball Saint Louis, Missouri

### Central Texas Section Joint Chapter PE31/PEL35/IE13/IA34 Established 12 February 1974 *Chair:* Steven L. Pearson Austin, Texas

Fort Worth Section, University of Texas at Arlington Student Branch IA34

Established 6 May 2014 *Chair*: Franklin Quilumba *Advisor*: Wei-Jen Lee Arlington, Texas

### Kansas City Section

Joint Chapter PE31/IA34 Established 23 March 1964 *Chair:* Christopher J. Dyer Kansas City, Missouri

### **Tulsa Section**

Joint Chapter PE31/IA34 Established 21 March 1977 *Chair:* Edwin L. Averill Tulsa, Oklahoma

### Dallas Section, University of Texas at Dallas Student Branch Chapter IA34 Established 30 October 2013 *Chair:* Adam Clark *Advisor:* Kaushik Rajashekara Dallas, Texas

Houston Section Chapter IA34 Established 1 November 1967 *Chair:* Tanja Djokic Houston, Texas

### New Orleans Section Chapter

IA34 Established 6 December 2008 *Chair:* Dean C. Ruiz New Orleans, Louisiana

### Wichita Section

Joint Chapter PE31/IA34 Established 18 November 1970 *Chair:* Ward T. Jewell Wichita, Kansas

### IEEE REGION 6 (WESTERN UNITED STATES)

### **Buenaventura Section**

Joint Chapter RA24/IA34 Established 14 March 2007 *Chair:* Douglas R. Askegard California

### Las Vegas Section Chapter IA34 Established 14 March 2004 *Chair:* Sean Vallesteros Las Vegas, Nevada

(continued)

### David Eng Student Branch

Area Chair

**Chapters Area Chair** Ziqiao Liu (R1–9) Boise Section Joint Chapter PE31/IA34 Established 30 March 2001 *Chair:* Said Ahmed-Zaid, Mark B. Bussert Boise, Idaho

### IEEE REGION 6 (WESTERN UNITED STATES) (continued)

California

### Metropolitan Los Angeles Section Chapter IA34 Established 5 October 1965 *Chair*: Prabu M. Shankar Los Angeles, California

### Sacramento Valley Section Joint Chapter PE31/IA34 Established 13 August 1993 *Chair:* Mohammad Vaziri Yazdi Sacramento, California

### Seattle Section Chapter IA34 Established

1 November 1967 Chair: Tom Edward Johnson Seattle, Washington

### Oakland-East Bay Section Chapter

IA34 Established 19 November 1975 *Chair: Mi*chael T. Nakamura Oakland, California

### San Fernando Valley Section Chapter

IA34 Established 31 January 2014 *Chair:* Kourosh Sedghisigarchi Los Angeles, California

### **Spokane Section**

Joint Chapter TM14/IA34 Established 24 June 1978 *Chair:* Brad Michael Blunn, Janelle Lee Spokane, Washington

### Orange County Section Joint Chapter PE31/IA34 Established 16 February 1983 *Chair:* Ian R. Varley Orange County,

### San Francisco Section Chapter

IA34 Established 16 December 1964 *Chair:* James Paul Avery San Francisco, California

### Oregon Section Chapter 1A34 Established 20 May 1971 *Chair:* James E. Cook Portland, Oregon

### Santa Clara Valley Section Joint Chapter PE31/IA34

Established 6 October 1993 *Chair:* Stephen A. Jordan Santa Clara, California

### IEEE REGION 7 (CANADA)

### Area Chair Joseph Sporea

**Student Branch Chapters Area Chair** Ziqiao Liu (R1–9)

Northern Canada Section Joint Chapter PE31/IA34 Established 7 May 1987 *Chair:* Alexandre B. Nassif Alberta, Canada Canadian Atlantic Section Joint Chapter PE31/IA34 Established 7 April 1989 *Chair:* Mehran Zamani Halifax, Nova Scotia, Canada

### Ottawa Section Chapter IA34

Established 9 October 2013 *Chair:* Dongli Zhang Ottawa, Ontario, Canada

### Montreal Section Chapter 1A34 Established 4 September 1973 *Chair:* Sheldon S. Williamson Montreal, Quebec,

Canada

### Southern Alberta Section Joint Chapter PE31/IA34 Established 2 May 1979 Chair: Dale Tardiff Calgary, Alberta, Canada

### North Saskatchewan Section Chapter PE31/IA34 Established

1 June 2005 *Chair:* Ramakrishna Gokaraju Saskatchewan, Canada

### Southern Alberta Section, University of Calgary Student Branch Joint Chapter PE31/IA34 Petition approval in progress *Chair:* Brad Coleman *Advisor:* Salima Kairzhanova Calgary, Alberta, Canada (continued)

### IEEE REGION 7 (CANADA) (continued)

Toronto Section Joint Chapter PE31/IA34 Established 2 June 2004 *Chair:* Ali Nabavi-Niaki Toronto, Ontario, Canada

### Vancouver Section Joint Chapter IE13/IA34 Established 18 May 1993 *Chair:* Jeff M. Bloemink Vancouver, British Columbia, Canada

### **REGION 8**



### IEEE REGION 8 (AFRICA, EUROPE, MIDDLE EAST)

### Area Chair Igor Kuzle

**Student Branch Chapters Area Chair** Luigi Parise Algeria Subsection Joint Chapter IE13/IA34 Established 8 June 2012 *Chair:* Fateh Krim Algiers, Algeria Algeria Subsection, Mentouri University Constantine Student Branch Chapter IA34 Established 18 June 2012 *Chair:* Yassine Maouche *Advisor:* Khezzar Abdelmalek Constantine, Algeria

### Austria Section Joint Chapter IE13/IA34/PEL35 Established 20 May 2011 *Chair:* Annette Muetze Vienna, Austria

### IEEE REGION 8 (AFRICA, EUROPE, MIDDLE EAST) (continued)

Benelux Section Joint Chapter PE31/IA34/PEL35 Established 23 July 1999 *Chair:* Luc Dupre Gent, Oost-Vlanderen, Belgium

Croatia Section Chapter IA34 Established

30 April 2008 *Chair:* Hrvoje Pandzic Zagreb, Croatia

### Denmark Section, Aalborg University Student Branch Chapter IA34

Petition approval in progress Chair: Ka Ma Advisor: Frede Blaabjerg Aalborg, Nordjylland, Denmark

France Section, University of Picardie Jules Verne Student Branch Chapter IA34 Established 18 March 2013 *Chair:* Mehrdad Davarifar Rachid Belmeskine Advisor: Zahra Daneshi-far Amiens, Picardie, France

Greece Section Joint Chapter IE13/IA34/PEL35 Established 22 August 2003 *Chair:* Stefanos Manias Greece

### Benelux Section, University of Leuven Student Branch Joint Chapter IE13/IA34 Established 28 September 2012 *Chair:* Hanspeter Höschle *Advisor:* Johan Driesen Leuven, Belgium

### Croatia Section, University of Zagreb Student Branch Chapter

IA34 Established 15 June 2012 *Chair:* Jasmin Uzelac *Advisor:* Igor Kuzle Zagreb, Croatia

# Egypt Section Chapter IA34

Established 4 April 2007 *Chair:* Elsayed Abdel-aliem Mohamed Cairo, Egypt

### France Section, University of Technology Belfort-Montbéliard Student Branch Chapter IA34 Established 24 April 2013 Chair: Saeid Moosavi Anchepoli Advisor: Abdesslem Djerdir Belfort-Montbéliard,

### Greece Section, Democritus University of Thrace Student Branch Chapter

France

IA34 Established 9 July 2012 *Chair:* Galini Kondyli *Advisor:* Anthanasios Karlis Xanthi, Thrace, Greece

### Bosnia and Herzegovina Section Joint Chapter IA34/PEL35 Established 1 July 2014 *Chair:* Petar Matic Sarajevo, Bosnia and Herzegovina

### Czechoslovakia Section Joint Chapter

IE13/IA34 Established 22 January 2010 *Chair:* Matej Pacha Zilina, Slovakia

### Finland Section Joint Chapter

IE13/PE31/IA34/PEL35 Established 9 August 2006 *Chair:* Kai F. Zenger Espoo, Helsinki, Finland

### **Germany Section**

Joint Chapter IE13/IA34/PEL35 Established 18 December 1997 *Chair:* Omid Forati Kashani Berlin, Germany

### Hungary Section

Joint Chapter IA34/PEL35 Established 1 June 2004 *Chair:* Dénes Fodor Budapest, Hungary

### Bosnia and Herzegovina Section, University of Sarajevo Student Branch Chapter IA34 Established 18 June 2012 Chair: Tarik Hubana Advisor: Vedad Becirovic Sarajevo, Bosnia, and

### Denmark Section Joint Chapter

Herzegovina

IE13/IA34/PEL35 Established 1 March 2002 *Chair:* Soren B. Kjaer Aalborg, Nordjylland, Denmark

### France Section Joint Chapter

IE13/IA34/PEL35 Established 19 January 1995 *Chair:* Gérard-André Capolino Amiens, Picardie, France

### Germany Section, RWTH Aachen University of Technology Student Branch Joint Chapter

PE31/IA34/PEL35 Established 15 October 2010 *Chair:* Marco Stieneker *Advisor:* Rik W. De Doncker Aachen, Germany

### Hungary Section, Budapest University of Technology and Economics Student Branch Joint Chapter PE31/IA34 Established 20 May 2009 Chair: Beáta Polgári Advisor: László Prikler Budapest, Hungary

### IEEE REGION 8 (AFRICA, EUROPE, MIDDLE EAST) (continued)

**Israel Section** 

Joint Chapter

IE13/IA34

Israel

IA34

Established

Rome, Italy

Established

21 April 1986

Chair: Irad Ben-Gal

**Italy Section Chapter** 

17 November 2010

Chair: Giuseppe Parise

Hungary Section, Obuda University Student Branch Chapter IA34 Established 24 April 2012 *Chair:* Balázs Kelemen *Advisor:* Krisztián Lamár Budapest, Hungary

### Italy (Central and South) Section Joint Chapter

IA34/PEL35 Established 12 March 1997 *Chair:* Fabio Crescimbini Rome, Italy

Morocco Section, University of Sidi Mohamed ben Abdellah of Fés Student Branch Chapter IA34 Established 10 March 2014 *Chair:* Ola Barramou *Advisor:* Ahmed Aboutajeddine Fés, Morocco

### Portugal Section

Joint Chapter IE13/IA34/PEL35 Established 25 April 1994 *Chair:* Marcelino B. Dos Santos Lisbon, Portugal

### Russia (Northwest) Joint Chapter IA34/PEL35 Established 11 August 2003 *Chair:* Valery I. Chrisanov St. Petersburg, Russia

Iran Section, K.N. Toosi University of Technology Student Branch Chapter IA34 Petition approval in progress *Chair:* Hossein Salmani *Advisor:* Mohammad Tavakoli Bina Tehran, Iran

### Italy (North) Section

Joint Chapter IE13/IA34/PEL35 Established 20 April 1994 *Chair:* Silverio Bolognani Padova, Italy

### Norway Section Chapter

IA34 Established 27 February 2001 *Chair:* Inge B. Kindem Norway

Portugal Section, Instituto

**Student Branch Chapter** 

Advisor: Beatriz V. Borges

IE13/PE31/IA34/PEL35

15 December 1998

Moscow, Russia

Chair: Yuriy Rozanov

Superior Técnico

Chair: Giovanna

Lisbon, Portugal

**Russia Section** 

Joint Chapter

Established

IA34

Established

9 July 2007

Franchi

### ection Palestine Subsection, A Najah National Universit

Najah National University Student Branch Chapter 1A34 Established 3 July 2012 *Chair:* Hala Barham *Advisor:* Mohammed Abd Al-Nasser Al-Donbok Nablus, Palestine

### Republic of Macedonia Section Joint Chapter

IE13/IA34/PEL35 Established 5 December 2000 *Chair:* Goga V. Cvetkovski Skopje, Republic of Macedonia

### Russia Siberia Section Joint Chapter

IE13/IA34/PEL35 Established 9 August 2006 *Chair:* Sergey A. Kharitonov Novosibirsk, Siberia, Russia

### Italy Section, La Sapienza University Student Branch Chapter IA34 Established 28 October 2010 *Chair:* Emanuele Zennaro *Advisor:* Giuseppe Parise Rome, Italy

### Latvia Section Joint Chapter

IE13/IA34/PEL35 Established 14 January 2014 *Chair:* Ilya Galkin Riga, Latvia

### Poland Section Joint Chapter

PE31/IA34 Established 24 March 1992 *Chair: Miroslaw Parol* Warsaw, Poland

### Romania Section Chapter

IA34 Established 18 November 2011 *Chair:* Ion Boldea Timisoara, Romania

### Saudi Arabia Section Chapter

IA34 Established 25 June 2001 *Chair:* Ghaleb B. Al Dandan Saudi Arabia

### IEEE REGION 8 (AFRICA, EUROPE, MIDDLE EAST) (continued)

### Serbia and **Montenegro Section Joint Chapter** IE13/IA34/PEL35

Established 30 March 2001 Chair: Vladimir A. Katic Novi Sad, RS, Serbia

### **Spain Section**

Joint Chapter CS23/IA34 Established 10 October 2000 Chair: Pedro Balsa Madrid, Spain

### South Africa **Joint Chapter** IE13/PE31/IA34/PEL35 Established 16 April 1990 Chair: Mohamed A. Khan Cape Town, Western Cape, South Africa

### **Sweden Section Chapter** IA34

Established 19 May 2008 Chair: Yung-Kang R. Chin Stockholm, Sweden

### South Africa, University of Cape Town Student **Branch Chapter**

IA34 Established 9 July 2012 Chair: Magnaem Simon Advisor: Mahele E. Dlodlo Cape Town, South Africa

### **Tunisia Section Chapter** IA34

Established 8 July 2010 Chair: Habib M. Kammoun Chapter Sfax, Tunisia

### South Africa, University of Pretoria Student **Branch Chapter** IA34

Established 18 June 2012 Chair: Lesley Arakkal Advisor: Esrom Mahlatsi Malatii Pretoria, South Africa

**Tunisia Section, École** Nationale d'Ingénieurs de Sfax Student Branch

IA34 Established 2 November 2010 Chair: Nouha Dziri Advisor: Mohamed Habib Kammoun

**Tunisia Section, Higher** School of Tech and **Computer Science Student Branch** Chapter IA34 Petition approval in progress Chair: Safa Boughattas Advisor: Houda Ben Attia Advisor: Anis Sakly Sethom Tunis, Tunisia

**Tunisia Section, National Engineering School of Monastir Student Branch** Chapter IA34 Petition approval in progress Chair: Mohammed Souissi Monastir, Tunisia

### **UKRI Section Chapter** IA34

Established 12 March 1997 Chair: Amir Hussain London, United Kingdom



**IEEE REGION 9 (LATIN AMERICA)** 

### Area Chair Jose E. Correa

### Student Branch

Chapters Area Chairs Julio Alexander Garcia Maison (Central America), Jorge Ramos-Ruiz (Mexico), Lizeth Vega Medina (South America)

### Bolivia Section Joint Chapter PE31/IA34 Established 9 February 1999 *Chair:* Orlando R. Perez La Paz, Bolivia

Argentina Section Joint Chapter IE13/CS23/RA24/IA34/ PEL35/VT06 Established 16 July 1991 *Chair:* Diego M. Alonso Bahia Bianca, Buenos Aires, Argentina

### Bolivia Section, Escuela Militar de Ingenieria Student Branch Chapter IA34

Established 22 February 2010 *Chair:* Sergio Fabian Callisaya Lafuente *Advisor:* Lizzette Jeniffer Carpio Rodriguez La Paz, Bolivia

### Bahia Section Chapter IA34 Established 26 June 1992 *Chair:* Silvio Roberto F. Ribeiro Bahia, Brazil

### Centro Occidente Section Chapter

IA34 Established 24 June 2009 *Chair:* Antonio Ramos Centro Occidente, Mexico

### Bahia Section (Northeast 1) Joint Chapter PE31/IA34/PEL35 Established 10 December 2001 *Chair:* Edison R. Da Silva Bahia, Brazil

### Chile Section Joint Chapter IE13/IA34/PEL35 Established 17 May 2007 *Chair:* Jorge Pontt Chile

### IEEE REGION 9 (LATIN AMERICA) (continued)

**Colombia Section** Chapter IA34 Established 2 October 2009 Chair: Lizeth Johanna Vega Medina Bogotá, Colombia

Colombia Section, Universidad Militar Nueva Granada **Student Branch** Chapter IA34 Established 19 January 2009 Chair: vacant Advisor: Byron Perez Bogotá, Colombia

**Ecuador Section** Chapter IA34 Established 5 December 2011 Chair: Carlos Patricio Molina Quito, Ecuador

Honduras Section, Universidad Nacional Autonoma de Honduras Student **Branch Joint Chapter** PE31/IA34 Established 28 June 2012 Chair: Edward Francisco Hernández Advisor: German Florez Avendano Tegucigalpa, Honduras

Colombia Section, Pontificia Universidad Javeriana Student Branch Chapter IA34 Established 20 May 2011 Chair: Lizeth Roldon Advisor: Andres Alberto Ladino Bogotá, Colombia

Colombia Section, Universidad Nacional De Colombia Sede Bogotá **Student Branch Chapter** IA34 Established 9 May 2013 Chair: Julio Chinchilla Guarin

Advisor: Javier Rosero Garcia Bogotá, Colombia

Ecuador Section, Escuela El Salvador Section Superior Politecnica del Litoral Student Branch Chapter IA34 Established 18 August 2004 Chair: Halderg Solano Advisor: Holger I. Cevallos Guayaquil, Ecuador

Mexico Aquascalintes Section, Instituto Technologico de **Aquascalientes Student** Branch Chapter IA34 Established 30 September 2011 Chair: Jorge Alejandro Delgado Aguiñaga Advisor: Elvia Ruiz Beltran Aguascalientes, Mexico Colombia Section, Universidad de San **Buenaventura Sede** Bogotá D.C. Student **Branch Chapter** IA34 Established 6 July 2011 Chair: Sebastian Garcia Garcia Advisor: Hernan Mauricio Cano Bogotá, Colombia

Colombia Section, University of the Andes **Student Branch Chapter** IA34

Established 20 November 2012 Chair: Miguel Eduardo Hernandez Figueredo Advisor: Gustavo Ramos Bogotá, Colombia

Chapter IA34 Established 29 May 1989 Chair: Manuel Napoleon Cardona Guiter. Jose M. Quinonez San Salvador, El Salvador

Mexico Centro Occidente Section, Instituto Technologico de Morelia **Student Branch Chapter** IA34 Established 25 August 2010 Chair: Solyelis Josefine Rodriguez

Advisor: Manuel Madrigal Morelia, Centro Occidente, Mexico

Colombia Section, **Universidad Distrital** Francesco Jose de Caldas Student **Branch Chapter** IA34 Established 25 August 2010 Chair: Carol Johanna Pérez Mera Advisor: Leidy Yinet Ferro Lara Bogotá, Colombia

Costa Rica **Section Chapter** 

IA34 Established 26 November 2001 Chair: Fabricio Mora Mora Santo Domingo, Heredia, Costa Rica

**Honduras Section** Chapter

IA34 Established 28 July 2009 Chair: Oscar Aquilar, Gina G. Houghton Tegucigalpa, Honduras

Mexico Centro Occidente Section, Universidad Michoacana de San Nicolas de Hidalgo **Student Branch Chapter** IA34 **Established** 25 August 2010 Chair: Salvador Alvarez Zalapa Advisor: Elisa Espinosa Juarez Michoacana, Centro Occidente, Mexico (continued) IEEE INDUSTRY APPLICATIONS MAGAZINE • JAN|FEB 2015 • WWW.IEEE.ORG/IAS

### IEEE REGION 9 (LATIN AMERICA) (continued)

**Mexico Morelos** Section, Universidad del Sol Student Branch Chapter IA34 **Established** 16 September 2010 Chair: Alejandro Benitez Muniz Advisor: Leoncio Aguilar-Negrete Cuernacava, Morelos, Mexico

### **Nicaragua Section** Chapter

IA34 Established 19 February 2013 Chair: Mario R. de la Ossa Managua, Nicaragua

Peru Section, Pontificia **Universidad Catolica** del Peru Student Branch Chapter IA34 Established 16 January 2010 Chair: Angel Kamt Marconi Advisor: Javier Chang Fu Lima, Peru

### Peru Section, **Universidad Particular Ricardo Palma Student Branch Chapter** IA34 Established 23 August 2013 Chair: Allison Pamela Izquierdo Calland Advisor: Patrick Villanueva Bartra

**Mexico Section** Chapter IA34 Established 23 January 1974 Chair: Gilberto H. Enriquez Mexico

Panama Section Chapter

Chair: Jose Eduardo Diaz

Panama City, Panama

**Universidad Catolica** 

Mongrovejo Student

Chair: Adriana Lisette

Advisor: Maximiliano

**Universidad Privada** 

**Branch Chapter** 

Established

Trujillo, Peru

11 June 2013

IA34

Antenor Orrego Student

Chair: Anibal Orlando

Rodriguez Barruteo

Advisor: Guillermo Evangelista A.

IA34

Established

Peru Section,

Santo Toribio de

**Branch Chapter** 

20 March 2014

Ghersi Burga

Arroya Ulloa

Peru Section,

Chiclayo, Peru

**Established** 

IA34

6 February 1998

Mexico Veracruz Section Instituto Technologico Superior de Coatzacoalcos Established 17 November 2012 Chair: Horacio Lopez Advisor: Tadeo Urbina Gamboa Coatzacoalcos, Mexico

**Morelos Section Chapter** IA34 Established 10 January 2006 Chair: Luis Ivan Ruiz-Flores Morelos, Mexico

### Panama Section, **Universidad Technologica** de Panama Student Branch Chapter IA34

Established 25 August 2009 Chair: Julio Alexander Garcia Maison Advisor: Alcibiades Mayta Panama City, Panama

Peru Section, Universidad Continental de Ciencias e Ingenieria Student Branch Chapter IA34 Established 16 July 2013 Chair: Ricardo Mercado Inche

Advisor: Ricardo Salcedo 7arate Huancayo, Peru

### **Puerto Rico and Caribbean Section Chapter**

IA34 Established 20 January 1995 Chair: Victor E. Simons San Juan, Puerto Rico

### **Peru Section Chapter** IA34 Established 3 December 1998 Chair: Juan Alberto Quintana Effio Lima, Peru

### Peru Section, Universidad Nacional del Callao Student Branch Chapter IA34

Established 13 June 2012 Chair: Marco Antonio Cruz Preciado Advisor: Alex Alfredo Vallejos Zuta Lima, Peru

### **Rio De Janeiro Section** Joint Chapter

IE13/IA34/PEL35 Established 4 September 2001 Chair: Jose A. Santisteban Niteroi, Rio de Janerio, Brazil

(continued)

# Lima, Peru

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### IEEE REGION 9 (LATIN AMERICA) (continued)

South Brazil Joint Chapter E25/PE31/MAG33/IA34/ PEL35 Established 2 June 2005 *Chair:* Renato Carlson South Brazil, Brazil

### South Brazil Section Chapter 1A34 Established 2 March 1984 *Chair:* Mario Y. Ogava South Brazil, Brazil

### Trinidad and Tobago Section Chapter IA34 Established 7 June 2004 *Chair:* Abidah Shanaz Mohamed Caribbean, Trinidad and Tobago

Venezuela Section Chapter IA34 Established 15 September 1997 *Chair:* Luis E. Zambrano Venezuela



### **IEEE REGION 10 (ASIA AND PACIFIC)**

### **Area Chair** Darmawan Soetanto

Student Branch Chapters Area Chairs Srikanth Vasudevan P. (West), Yufan Guan (East) Bangalore Section, Indian Institute of Sciences Student Branch Joint Chapter IE13/IA34 Established 17 December 2012 *Chair:* Roshan Kumar P. *Advisor:* K. Gopakumar Bangalore, India

### **Beijing Section Chapter**

IA34 Established 3 February 1995 *Chair:* Yongdong Li Beijing, China

### **Bombay Section**

Joint Chapter PE31/IA34 Established 23 July 1999 *Chair:* Suryanarayana Doolla Mumbai, Maharastra, India *(continued)* 

### IEEE REGION 10 (ASIA AND PACIFIC) (continued)

**Bombay Section**, **Thadomal Shahani Engineering College Student Branch** Chapter IA34 **Established** 31 December 2012 Chair: Vivek Motwani

Advisor: Gopal Pardesi Mumbai, Maharastra, India

### Chennai (Madras) **Section Chapter** IA34 Established 2 August 2006

Chair: S. Rajavel Chennai, India

Gujarat Section, G.H. Patel College of **Engineering and Technology Student Branch Chapter** IA34 Established 23 May 2013 Chair: Nishant Bhalani Advisor: Gunvanthray Patel

### Gujarat, India **Hyderabad Section** Joint Chapter

Gandhinagar,

PE31/IA34/PEL35 Established 11 August 1992 Chair: R. Balasubramanian Hyderabad, India

Changwon Section, Kyungsung University Student Branch Joint Chapter IE13/IA34/PEL35 Established 30 January 2014 Chair: Zhenyao Xu Advisor: Jin-Woo Ahn Busan, Korea

**Delhi Section** 

Joint Chapter

PE31/IA34

Established

Delhi, India

Gujarat Section,

Marwadi Education

**Institutions Student** 

**Branch Chapter** 

Established

Vastarpara

Sabhadia

15 June 2012

Chair: Kaushik

Advisor: Haresh

India Council

Joint Chapter

1 February 1984

Chair: Nilesh Bajoria

TM14/IA34

Established

India

Rajkot, Gujarat, India

IA34

Foundations Group of

10 June 1997

Chair: Sukumar Mishra

Changwon Section, **Pukyong National University Student** Branch Chapter IA34 Established 12 February 2014 Chair: Hak-Soo Kim Advisor: Nho Cheol Busan, Korea

### **Gujarat Section**

Joint Chapter IE13/IA34/PEL35 Established 14 March 1994 Chair: Rahul R. Dubey Gandhinagar, Gujarat, India

**Gujarat Section, Pandit Deendayal Petroleum University Student Branch** Chapter IA34 Established 22 July 2013 Chair: Sumit Chhabria Advisor: Nishant Parikh Gandhinagar, Gujarat, India

### Japan Council Chapter

IA34 Established 1 November 1973 Chair: Kan Akatsu Tokyo, Japan

### Changwon Section, Pusan National University Student **Branch Chapter** IA34

Established 27 March 2014 Chair: Jangmyung Lee Advisor: Jong-ho Han Busan, Korea

### **Gujarat Section**, Dhirubhai Ambani Institute of Information and Communication **Technology Student Branch Chapter** IA34 Established 15 June 2012 Chair: Vidhan Agarwal Advisor: Rahul R. Dubey Gandhinagar, Gujarat, India

### Hong Kong Section Joint Chapter

IE13/PE31/IA34/PEL35 Established 16 February 1883 Chair: Eric Z. Ma Hong Kong, China

### Kerala Section, College of Engineering Munnar **Student Branch Chapter** IA34

Established 11 November 2013 Chair: Sidharth Sankar P. Advisor: Biju K. Munnar, Kerala, India (continued)

### IEEE REGION 10 (ASIA AND PACIFIC) (continued)

Joint Chapter IE13/IA34/PEL35 Established 14 April 1989 Chair: Vincent George Trivandrum, Kerala, India Kerala Section, Rajiv Gandhi Institute of **Technology Student Branch Chapter** IA34 IA34 **Established** 5 May 2010 Chair: Williams K. Francis Advisor: Vincent George Kottayam, Kerala, India Kottayam, Kerala, India

**Kerala Section** 

Kolkata (Calcutta) **Section Chapter** IA34 Established 8 October 1997 Chair: Sujit K. Biswas West Bengal, India

**Nanjing Section Joint Chapter** PE31/IA34 Established 12 November 2007 Chair: Ming Cheng Nanjing, China

Kerala Section, Amrita Vishwa Vidyapeetham University Student Branch Chapter IA34 Established 9 November 2012 Chair: Visal Raveendran Advisor: Srikanth Vasudevan P. Ettimadai, Kollam, Kerala, India

**Kerala Section, Saint** Gits College of **Engineering Student** Branch Chapter

**Established** 15 June 2012 Chair: Sebin Joseph Advisor: Jaison Cherian

Korea Council Joint Chapter IE13/IA34/PEL35 **Established** 3 December 2013 Chair: Jin-Woo Ahn Busan, Korea

### Nanjing Section, Southeast University **Student Branch Chapter**

IA34 **Established** 19 June 2012 Chair: Gan Zhang Advisor: Wei Hua Nanjing, Jiangsu, China Kerala Section, Mar Athanasius College of **Engineering Student Branch** Chapter IA34 Established 2 January 2014 Chair: Divya Jose Advisor: Mathew K. Kothamangallam, Kerala, India

### Kerala Section, St. Joseph's College of Engineering and **Technology Student Branch** Chapter IA34

Petition approval in progress Chair: Sherin Mariam Vaidyan Advisor: Jojin Thomas Pallai, Kerala, India

Madras Section, Hindustan Institute of Technology and **Science Student Branch** Chapter IA34 Established 16 April 2013 Chair: Mohan C. Advisor: Terence Ebinasar

**New South Wales Section** Joint Chapter IE13/IA34/PEL35 Established 18 April 1996 Chair: Jian G. Zhu Sydney, New South Wales, Australia

Chennai, India

**Kerala Section, MEA Engineering College Student Branch Chapter** IA34 Petition approval

in progress Chair: Ashfak C. Advisor: Ajmal K.T. Perinthalmanna, Kerala, India

Kerala Section, Vimal Jyothi Engineering **College Student Branch** Chapter IA34 Established 18 September 2013 Chair: Jyothis Joseph Advisor: Nikhil Valsan K. Chemperi, Kannur, Kerala, India

**Malaysia Section** Joint Chapter IE13/IA34/PEL35 Established 8 August 2013 Chair: Mustafar K. Hamzah Malaysia

**New South Wales** Section, University of Wollongong Student **Branch Chapter** IA34

Established 31 December 2012 Chair: M.D. Abu Abdullah Advisor: Kashem Mohammad Muttaai Wollongong, New South Wales, Australia

### IEEE REGION 10 (ASIA AND PACIFIC) (continued)

### New Zealand North Section Joint Chapter IE13/IA34 Established 17 April 1972 *Chair:* Duleepa J. Thrimawithana

# Taipei Section ChapterIA34Established28 December 2008

28 December 2008 *Chair:* Po-Tai Cheng Taipei, Taiwan

New Zealand

### Pune Section

Joint Chapter PE31/IA34 Established 8 August 2011 *Chair:* Geetanjali A. Vaidya Pune, India

### Taipei Section, National Taiwan University of Science and Technology Student Branch Chapter IA34

Established 6 May 2014 *Chair:* Yu-Chen Liu *Advisor:* Huang-Jen Chiu Taipei, Taiwan

### Shanghai Section 1A34 Petition approval in progress *Chair:* Wentao Lee Shanghai, China

### Taipei Section, National Tsing Hua University Student Branch Chapter IA34 Established 19 February 2013 *Chair:* Chia Tse Lee

Advisor: Po-tai Cheng

Taipei, Taiwan

Singapore Section Joint Chapter IA34/PEL35 Established 29 September 1992 *Chair:* Dilip V. Battul Singapore

### Thailand Section Joint Chapter

IE13/IA34/PEL35 Established 18 August 2006 *Chair:* Vijit Kinnares Thailand

### Joint Chapter PE31/IA34 Established 23 August 1995 *Chair:* Saikat Chakrabarti Kanpur, Uttar Pradesh, India

**Uttar Pradesh Section** 



# **Presidential** Memories

t is great to be celebrating the 50th anniversary of the IEEE Industry Applications Society (IAS). During this time, we have to acknowledge that the Society is in such a good standing because of the work of many volunteers over the years. Individuals who drove the Society as leaders at various times played a major part in the growth of the Society. Their visionary leadership immensely helped us in growing the Society by establishing new initiatives, including new technical committees, and also by expanding the Society to a truly global organization.



IAS presidents at a strategic planning session in Atlanta. Back row, from left: Robert D. Lorenz, Barry Brusso, S. Mark Halpin, Kevin Peterson, Thomas A. Nondahl, and Bruno Lequesne. Front row, from left: R. Mark Nelms, Blake Lloyd, Carlton E. Speck, Eugene J. Fagan, and H. Landis "Lanny" Floyd.

### IAS SOCIETY PRESIDENTS

1965–1966	Robert B. Moore	1989	Eugene J. Fagan				
1966–1967	Carl R. Olson	1990	Linos J. Jacovides				
1968	James L. Cooney	1991	Ronald M. Jackson				
1969	Donald S. Brereton # +	1992	M. Dayne Aldridge				
1970	Harold G. Frostick	1993	Baldwin Bridger, Jr.				
1971	Artiur M. Killin	1994	Thomas A. Lipo				
1972	Irvin N. Howell, Jr. #	1995	Barry C. Brusso #				
1973	Walter R. (Joe) Harris	1996	Fred C. Trutt				
1974	George W. Younkin	1997	Paolo Tenti				
1975	John F. Cachat	1998	Carlton E. Speck				
1976	F.A. (Tony) Furfari #	1999	Ira J. Pitel				
1977	Robert V. Wachter	2000	Caio A. Ferreira				
1978	Edward A.E. Rich	2001	Robert D. Lorenz #				
1979	H. Paul Meisel	2002	R. Mark Nelms				
1980	James H. Beall #	2003	Jerry L. Hudgins				
1981	George F. Bobart	2004	Kevin Peterson				
1982	Bernard W. Whittington	2005-2006	H. Landis "Lanny" Floyd				
1983	George W. Walsh	2007-2008	S. Mark Halpin				
1984–1985	Richard S. Nichols # +	2009-2010	Thomas A. Nondahl				
1986	E.G. (Al) Kiener # +	2011-2012	Bruno Lequesne				
1987	Robert B. Voller #	2013-2014	Blake Lloyd				
1988	Lloyd A. (Pete) Morley # +	2015	David Durocher				
Key: # Also served as Division II director. + Also served as IEEE officer.							

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With this in mind, we asked some of the past presidents to provide a brief reminiscence about the Society. I am honored to have the opportunity to introduce them in this section.

> —Tomy Sebastian IEEE IAS Vice President (2013–2014)

### **Pete Morley**



Congratulations to the IEEE IAS and its members on our 50th anniversary! My key r e m i n i s c e occurred when I joined the IAS in 1974 and quickly

I KNOW THAT IAS

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OF IEEE'S

**CORNERSTONES** 

AND HAS

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SIGNIFICANTLY

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THE WORLD'S

PREMIER

**TECHNICAL** 

PROFESSIONAL

ORGANIZATION.

-PETE MORLEY

found a network of colleagues within

my areas of specialization. I was amazed with the resources and activities, such as committees, conferences, publications, standards, and more. As an applications engineer, the Society provided me with not only the technological home that enabled my successful career but also the background that led to 39 continuous years as an IEEE volunteer. My highlight year was 1988, when I served as the IAS president and was elected IEEE Fellow. However, my years in IAS, particularly as a volunteer, have given me something more special-numerous friends, even though years and locations have separated us.

I know that the IAS formed one of IEEE's cornerstones and has contributed significantly to making the IEEE the world's premier technical professional organization. I wish the IAS and our members continued success. I am confident this will occur. I also encourage our members to become active volunteers. These individuals provide the prime ingredient to the Society's support that enables success. The value that an IAS volunteer receives far exceeds the expended effort.

—Pete Morley IEEE IAS President (1998)

I was not present

at the creation,

but I do remem-

ber my first

Annual Meeting.

It was in Chicago

and, if I remem-

ber correctly, in

### **Linos Jacovides**



1970. I had criticized a paper that Tom Lipo gave at the IEEE Power Engineering Society meeting the previous year, and since I was wrong, it was an opportunity to meet socially with him and apologize.

I did, and I remember his primary concern was finding Demerara sugar. Tom had done post-doctoral research in the United Kingdom, and I guess he was hooked. I do not remember if we found it, but we found each other, and this led to a lifelong friendship.

The moral of my story is that the IAS is not just papers and awards but bringing people together and making friends. I attended every Annual Meeting until I became a manager, when I thought it would be more useful for practicing engineers in my group to go. Perhaps that was a mistake—Tomy's request to write this brought back a lot of

fond memories. —Linos Jacovides IEEE IAS President (1990)

### **Baldwin Bridger**

The first contact I can remember with a part of the IAS was attending the annual conference of what became the Industrial and Commercial Power Systems (I&CPS) Department in about 1969 in Baltimore. Almost immediately, I was drawn

into working on the *Green Book*. From that point, my involvement in all things I&CPS and IAS grew, attending conferences, serving on commit-

tees, and learning-especially learning. Listening to papers presented by such experts on industrial power systems as Ralph Lee, Dick Kaufmann, Don Brereton, Kao Chen, George Walsh, and many others or chatting with them after the formal programs was an education that cannot be had anywhere else. After serving in various department and Society offices, I was honored to be elected as president of IAS for 1993. Probably the greatest accomplishment of that year was the decision to begin publication of IEEE Industry Applications Magazine. I wish I could claim credit for it, but I was actually rather negative about the whole idea. However, the Executive Board approved it, and we celebrated the 20th anniversary of its introduction in 2014. I guess this proves that many heads are better than one!

> —Baldwin Bridger IEEE Life Fellow IEEE IAS President (1993)

### Barry C. Brusso



How do we view our history in retrospect to make it relevant to our Society today? What did our forebearers establish in the framework of our newly

founded Society under the IEEE umbrella 50 years ago that secured the foundation upon which we have progressed to this day? What technological breakthroughs fostered a major change in our Society, leading to the establishment and attraction of so many of our members to the IEEE Power Electronics Society (PELS)? What is the vision of our current leadership in taking the IAS forward decades from now? To all these questions there are no right or wrong answers but simply opportunities to explore the rich history of our Society and to clearly and better understand who we are, where we came from, and where are we going.

I LEARNED TO

**APPRECIATE** 

WHAT IT MEANS

TO BE A

**VOLUNTEER IN** 

THE TRUE SENSE

OF THE TERM.

-BARRY C.

BRUSSO

During my tenure on the IAS Executive Board and the IEEE Board of Directors. which spanned from 1990 until 2001, I learned to appreciate what it means to be a volunteer in the true sense of the term. A volunteer is a person who cannot say no. One soon recognizes the wealth of challenges and opportunities laid before him in committing time and energy to the business

of the IAS and the IEEE. In this sense, you become an imbedded part of the Society's history, culture, community, and future. There is no greater personal satisfaction than that derived from the friendships and a sharing of common interests in the technologies and overall socialization experiences you gain from being part of this Society. I want to personally thank those visionaries who preceded me and wish those contemporaries who are leading the IAS today a very inspiring 50th-anniversary celebration.

> —Barry C. Brusso IEEE Life Fellow IEEE IAS President (1995)

### Paolo Tenti



Serving as IAS president in 1997 (the first Italian president!) was an extraordinary experience that followed seven years as a member-atlarge of the Execu-

tive Board and chair of the Industrial Power Converter Committee (IPCC) European liaison.

At that time, the IAS Executive Board was an assembly of people who substantially contributed to the renovation and extension of the Society vision (Barry Brusso, Caio Ferreira, Steve Larson, Tom Lipo, Bob Lorenz, Mark Nelms, Tom Nondahl, Ira Pitel, Andy Smith, Carl Speck, and Fred Trutt, just to mention a few). In particular, the intersociety cooperation effort was given full attention.

> Under the guidance of Barry Brusso, this initiative progressively extended to involve the IEEE Industrial Electronics Society, PELS, the IEEE Power and Energy Society, and other international organizations: Associated Electrical Industries (AEI), EPE, Institution of Electrical Engineers (IEE), and Institute of Electrical Engineers of Japan (IEEJ).

I am proud to remember a spectacular

intersociety event in 2000, when the IAS Annual Meeting became the World Conference on Industrial Applications of Electrical Energy, cosponsored by IAS, PELS, IEE, IEEJ, EPE, and AEI. Held in Rome, it attracted more than 1,250 delegates from 62 countries. This is an unprecedented record, whose merit goes to Local Chair Fabio Crescimbini, his phenomenal team, and two unforgettable friends: Alfio Consoli, chair of a crucial preparatory intersociety meeting in Sicily, and Steve Hagemoen, the extraordinary Meetings Department chair.

> —Paolo Tenti IEEE IAS President (1997)

### **Carlton E. Speck**



In 1998, the Society was beginning to see the fruits of the seeds planted three years earlier by Past President Barry Brusso: the establishment of

sister societies in Europe and Asia and the growth of worldwide Chapters activities. It reminds me of the importance of planning and the establishment of goals in setting the direction of the organization. With that, I am pleased to see the new activities of the Executive Board growing out of the most recent long-range planning retreat held December 2013 in Atlanta beginning to take shape. I offer the Society my best wishes for another fruitful 50 years of advancing the practice of electrical and electronics engineering in industry.

> —Carlton E. Speck IEEE IAS President (1998)

### **Jerry Hudgins**



In the mid- to late 1980s, several engineers, such as David Borst of International Rectifier Inc., Duane Wolley of General Electric Co., and Dave

Blackburn of the U.S. National Institute of Standards and Technology (formerly the National Bureau of Standards), provided support for many young engineers interested in power semiconductors, such as myself. They afforded my first connections and involvement in the IAS. These engineers were great role models due to their easygoing style, sincere desire to help their colleagues, and keen interest in technology without boundaries. Each one was an effective communicator, particularly when discussing technical details with colleagues less mature in their profession, such as myself. It was with the urging of these and other IAS members that I became involved in conference planning and budgeting and the associated paper reviews for conferences and transactions. They were a strong influence on my perception of the value of the IEEE and the IAS and are not the exception but the rule for the collegiality of most IAS members with whom I have been in contact over these past 30 years.

> —Jerry Hudgins IEEE IAS President (2003)

### Thomas A. Nondahl



My journey with the IAS started with the Power Engineering Society (PES). In the late 1970s, I wrote some papers about small electric motors

and submitted them to the PES Winter Power Meeting. The papers were presented in sessions organized by the Single-Phase and Fractional Horsepower Subcommittee of the Rotating Machinery Committee. The sessions had some spirited discussions but were not well attended. So the subcommittee officers decided to try a different venue, and in 1984, they became a subcommittee of the IAS Industrial Drives Committee. Their sessions had much larger audiences, paper submissions and membership grew quickly, and in 1986, the subcommittee became a full IAS committee with a new name-the Electric Machines Committee (EMC). For several years, I attended the sessions, reviewed papers, and did occasional tasks for the committee. Then, at the 1989 Annual Meeting, John Oldenkamp, the head of the EMC Nominating Committee, asked if I would be the next secretary. That was the first in a series of 11 offices over a 22-year span. It has been a wonderful ride. And it was all due the initiative of a small group of people and their generosity in allowing me to work with them. I owe them a great deal.

> —Thomas A. Nondahl IEEE IAS President (2009--2010)

### **Bruno Lequesne**

Perhaps the most amazing aspect of IAS is its incredible diversity yet



rience. One could expand, of course, on the cultural diversity of our membership, which probably includes most nations and pretty much every religion on earth. It is quite interesting to pause sometimes and observe as IAS members gather together and find so much in common despite such varied personal backgrounds and differences. Beyond our shared human nature, we are all engineers after all, a bunch of geeks sometimes mis-

understood by the general public but always enjoying each other's company. As president, however, I was

common ground for camaraderie and shared expe-

> PERHAPS THE MOST AMAZING ASPECT OF IAS IS ITS INCREDIBLE DIVERSITY YET COMMON GROUND FOR CAMARADERIE AND SHARED EXPERIENCE.

> > -BRUNO LEQUESNE

dumbfounded by another diversity, that of professional focus, expertise, and interest within our committees

> and conferences, from individuals focusing on powering cement kilns to researchers developing the latest lighting system, or teams striving to improve electrical safety and reduce injuries through education and standard development. This technical diversity, perhaps unique within professional societies, is a great asset that I kept discovering and still am, even after leaving office. This is an asset I hope future members of the IAS will fully appreciate and that IAS leaders will nurture and leverage for the benefit of all.

> > —Bruno Lequesne IEEE IAS President (2011–2012)

> > > IAS

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# Society Awards Recipients

### **IEEE IAS AWARDS**

### IAS Outstanding Achievement Award Recipients

Award Recipients						
1969	Robert B. Moore					
1970	Charles F. Dalziel					
1971	Donald S. Brereton					
1972	Boris Mokrytski					
1973	Robert V. Wachter					
1974	Harold Winograd					
1975	Walter R. Harris					
1976	Ralph H. Lee					
1977	Irvin N. Howell					
1978	Richard Harold					
	Kaufmann					
1979	F.A. (Tony) Furfari					
1980	Richard M. Emberson					
1981	Edward A.E. Rich					
1982	Anthony C. Lordi					
1983	Ion I. Inculet					
1984	Russell W. Mills					
1986	Thomas A. Lipo					
1988	C. Curtis Herskind					
1989	Donald K. Ross					
1990	George W. Walsh					
1991	Thomas E. Sparling					
1992	M. Azizur Rahman					
1993	Bimal K. Bose					
1994	Ray P. Stratford					
1995	C. James Erickson					
1996	Austin H. Bonnett					
1997	Joachim Holtz					
1998	Donald W. Novotny					
1999	Akira Nabae					
2000	Kouki Matsuse					
2001	L. Bruce McClung					

2002 Rik W. De Doncker 2003 Robert D. Lorenz 2004 Hirofumi Akagi 2005 Nobuyki Matsui 2006 Jacobus Daniel van Wyk 2007 Caio Ferreira 2008 Paresh C. Sen 2009 Kaushik Rajashekara 2010 Tomy Sebastian 2011 Thomas Jahns 2012 No recipient Muhammad H. Rashid 2013 2014 Thomas A. Nondahl Longya Xu **IAS Distinguished Service Award Recipients** 1988 George W. Younkin 1989 **Richard S. Nichols** 1990 James H. Beall 1991 E.G. (Al) Kiener 1992 James W. Patterson 1993 Daniel L. Goldberg 1994 Eugene J. Fagan 1995 Lloyd A. (Pete) Morley 1996 John H. Kassebaum 1997 Edward A. E. Rich 1998 F.A. (Tony) Furfari 1999 Baldwin Bridger, Jr. 2000 Donald S. Brereton 2001 Michael J. Foley 2002 Frederick C. Trutt Andrew W. Smith 2003 2004 Dayne Aldridge

2005 2006	Satish Chaparala Peter Maayar					
2008	Clavton H. Reid					
2009	No Recipient					
2010	Mark Harris					
2011	Robert Lorenz					
2012	William D. Greason					
2013	H. Landis "Lanny" Floyd					
2014	Louie J. Powell					
IAS Andrew W. Smith						
Outsta	Inding Young Member					
Award	Recipients					
1996	Christine M. Kent					
1997	S. Mark Halpin					
1998	Iqbal Husain					
1999	Kimberly K. Eastwood					
2000	Annette von Jouanne					
2001	Leon M. Tolbert					
2002	Giovanna Oriti					
2003	Michael J. Hittel					
2004	Dan Neeser					
2005	Ganesh Kumar					
	Venayagamoorthy					
2006	Burak Ozpineci					
2007	Leila Parsa					
2008	Nadezhda A.					
	Dvurechenskaya					
2009	Ayman M. EL-Rafaie					
2010	Wei Qiao					
2011	No recipient					
2012	Zhi Gao					
2013	Akshay Kumar Rathore					
2014	Bin Lu					

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### IEEE AWARDS, MEDALS, AND TECHNICAL AWARDS

IEEE Richard Harold Kaufmann		IEEE Me	dals, IEEE Technical Field Awards, and IEEE	Service Award Recipients
Award Recipients		1961	AIEE Lamme Medal	Charles Concordia
1988	Walter C. Huening, Jr.	1984	IEEE Lamme Medal	William McMurray
1989	Bernard W. Whittington, Jr.	1984	IEEE Charles Proteus Steinmetz Award	H. Baron Whitaker
1990	Rene Castenschiold	1985	IEEE Lamme Medal	Loren F. Stringer
1991	John R. (Dunki)	1985	IEEE Haraden Pratt Award	Donald S. Brereton
	Dunki-Jakobs	1989	IEEE Medal for Engineering Excellence	Walter A. Elmore
1992	Kao Chen	1990	IEEE Charles Proteus Steinmetz Award	Warren H. Cook
1993	George W. Walsh	1994	IEEE Charles Proteus Steinmetz Award	Clayton H. Griffin
1994	Daniel J. Love	1995	IEEE Charles Proteus Steinmetz Award	L. Bruce McClung
1995	M. Shan Griffith	1995	IEEE Nikola Tesla Award	Thomas A. Lipo
1996	Marcus O. Durham	1996	IEEE Lamme Medal	Bimal K. Bose
1997	Thomas E. Sparling	1996	IEEE Medal for Engineering Excellence	John R. Dunki-Jacobs
1998	James A. Oliver	1998	IEEE Medal for Engineering Excellence	C. James Erickson
1999	Baldwin Bridger, Jr.	1999	IEEE Medal of Honor	Charles Concordia
2000	Alton Dewitt Patton	1999	IEEE Nikola Tesla Award	Nabeel A. O. Demerdash
2001	Louie J. Powell	2000	IEEE Lamme Medal	Joachim Holtz
2002	H. Landis "Lanny" Floyd	2000	IEEE Nikola Tesla Award	Syed A. Nasar
2003	Edward L. Owen	2001	IEEE Nikola Tesla Award	Steve Williamson
2004	Richard L. Nailen	2002	IEEE Charles Proteus Steinmetz Award	Ben C. Johnson
2005	A.P. Meliopoulos	2003	IEEE Nikola Tesla Award	Austin H. Bonnett
2006	George W. Younkin	2004	IEEE Medal for Engineering Excellence	Richard L. Doughty, H. Landis
2007	M. Azizur Rahman			"Lanny" Floyd, Thomas E. Nec
2008	Hirofumi Akagi	2005	IEEE Nikola Tesla Award	Thomas M. Jahns
2009	Ronald G. Harley	2006	IEEE Charles Proteus Steinmetz Award	S. Mark Halpin
2010	Gerald T. Heydt	2007	IEEE Nikola Tesla Award	Thomas W. Nehl
2011	David D. Shipp	2008	IEEE Nikola Tesla Award	Timothy J. E. Miller
2012	John P. Nelson	2009	IEEE Haraden Pratt Award	James H. Beall
2013	Kaushik Rajashekara	2012	IEEE Charles Proteus Steinmetz Award	Daleep Mohla
2014	Robert D. Lorenz	2014	IEEE Nikola Tesla Award	Hamid A. Toliyat

### Transportation Technologies Award

2014 Linos Jacovides

### Medal in Power Engineering

Thomas A. Lipo IAS history | barry brusso, erling hesla, thomas nondahl, & bruno lequesne



# The **50th-Anniversary** History **Update** of the **IAS**

history update of the IEEE Industry Applications Society (IAS) covering the years 1964-1995 was published on the 30th anniversary of the Society in October 1995 by IAS History Editor and Past President (1969) Donald S. Brereton [1]. Now, as we approach the 50th anniversary of the IEEE IAS, our rich history is once again being updated to reflect our accomplishments and mark the achievements of the many members who call the IAS their home Society under the IEEE umbrella. In reality, one might consider this to be the 70th anniversary of the IAS since it was created from two separate technical divisions of the American Institute of Electrical Engineers (AIEE), the Industry Division and the General Applications Division, which merged into the Industry and General Applications (I&GA) Group in 1964 [2]. The Institute of Radio Engineers (IRE) and AIEE merged in 1963 to form the IEEE.

The I&GA Group was established the next year. Under the IEEE umbrella, the status of the professional groups changed, raising their distinction in the public eye and becoming professional societies. In 1971, I&GA Group Chair Arthur Killin proposed to the IEEE Technical Activities Board that the group be converted to a Society. In 1972, Killin's proposal was granted, and

Digital Object Identifier 10.1109/MIAS.2014.2361991 Date of publication: 10 December 2014 the I&GA Group became a Society. The group name was changed to the IAS, with Irvin Howell as its president [4].

Starting in January/February 1995, the IAS upgraded its formida-

**OUR RICH HISTORY** 

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**UNDER THE IEEE** 

UMBRELLA.

ble ten-year-old newsletter into a bimonthly technical magazine and published the first issue of IEEE Industry Applications Magazine, with John H. Kassebaum as its editor-inchief. Tony Furfari, the past IAS newsletter editor, continued to express his opinions in a newly established "Commentary" column.

The dedicated volunteers of the Industrial and Commercial Power Systems (I&CPS) Department, using

their technical expertise, have created a most significant set of power system application principles for broad industry use. Today, the IAS is recognized for being the leader in publishing application-oriented information for practicing engineers in industry, commerce, and institutional facilities, and this is due in large part to the publication of the I&CPS *Color Book* series. On 10 May 1995, IAS President Barry C. Brusso presented a plaque to the chair of the I&CPS Department on the 50th anniversary of the first edition of the *Red Book*, the IEEE standard associ-

ated with electric power distribution for industrial plants, the first of our *Color Book* series.

In the 1990s, the IEEE was in a state of transition, trying to redefine its role as a large professional institute to better serve the needs of its U.S.- or North America-based membership while establishing its presence globally through transnational organizational changes. The technical Societies were being encouraged to reach out beyond our shores and create opportunities for increasing membership worldwide, establishing joint conferences, sharing technical publica-

tions, and defining a presence in parts of the world where engineers could directly benefit and identify with the IEEE.

The IAS Executive Board boldly voted to explore opportunities for intersociety cooperation between the IAS and the European Electrical Engineering Societies while conducting their own formal business meeting

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### THE SCOPE OF THE IAS

The scope of the IEEE Industry Applications Society (IAS), as a transnational organization, is the advancement of the theory and practice of electrical and electronic engineering in the development, design, manufacture, and application of electrical systems, apparatus, devices, and controls to the processes and equipment of industry and commerce; the promotion of safe, reliable, and economic installations; industry leadership in energy conservation and environmental, health, and safety issues; the creation of voluntary engineering standards and recommended practices; and the professional development of its membership.

and a strategic planning retreat 22-24 May 1995 in Monselice, Italy [5]. This decision formally established a dynamic change in the role the IAS would play henceforth in developing cooperative relationships and signed agreements with many European and Asian technical societies. Included within the five-year strategic plan drafted at this meeting by the board were key milestones for accomplishing intersociety cooperation among other professional societies as well as with other IEEE Societies sharing mutual interests. To clearly set the framework for a future presence of the IAS in Region 8, particularly Europe, a proposal was made to consider conducting the 35th Annual Meeting in Rome, Italy, in 2000; never before had the IAS Annual Meeting been held outside North America. In 1996, the IAS Executive Board approved conducting the Annual Meeting for 2000 in Rome, with Paolo Tenti, who was vice president of the Society at the time, as the general chair. This meeting became known as the 35th IAS Annual Meeting and World Conference on Industrial Applications of Electrical Energy.

In 1997, the Society's Long-Range Planning Committee amended its strategies resulting from the previous retreat and submitted its recommendations to the Executive Board. The board adopted the recommendations and included them in its Society review report to the IEEE Technical Activities Board for review and feedback. The revised scope of the Society reflected a new acknowledgment of its role as a global participant in standards, access to technical information using the latest techniques to communicate, expanding membership, and international and intersociety cooperation activities (see "The Scope of the IAS").

### IAS—A "First" in China

The People's Republic of China, mainland China, presented a particularly difficult problem for the IEEE in the late 1990s because of the decades-long period when we did not have good contact with engineers living there. Hope for an opening came with the 1972 meeting in Peking of President Richard Nixon and Chairman Chou En-lai; IEEE results were longer in coming.

Probably IAS's first direct involvement came when IAS member Kao Chen joined the IEEE delegation to visit China in 1982. Kao was an inspired choice as he was born in Shanghai, was fluent in Mandarin and several other dialects, had earned his B.S.E.E. degree from Jiao Tong University, and had gained outstanding professional recognition since leaving China. The IEEE worked assiduously during the following years to build ties with engineers in China; it was not easy. The IAS did not feel able to participate significantly at the time.

Things changed in the 1990s. By then, the IAS Chapters Department had grown in strength, broadened its view, and aggressively pursued the development and nurturing of Chapters, particularly those outside the historical base of the United States and Canada. While fully aware that developing IAS Chapters in China would not be easy, Kao Chen urged the IAS to become proactive in developing contacts there, to take time by the forelock. His efforts bore fruit in 1995, when he was selected as Distinguished Lecturer (DL) for 1996-1997 with an implied commitment to lecture in China. Thanks in large part to the leadership and strong support of both IAS President Fred Trutt and Chapters Chair Caio Ferreira, the implied commitment became fact.

Kao Chen had always maintained his contacts with leading engineers in China, many of whom he knew personally, some from his undergraduate years. Through these well-established relationships, a series of lectures in late 1996 were agreed upon, with the subjects to be those offered under the DL program: 1) energy management in electrical and illuminating systems for industrial and commercial facilities, 2) energy effective illuminating systems, and 3) effects of nonlinear loads on system power quality and the latest recommendations on its limitations. (Much of this information can be found in Chen's book Energy Management in Illuminating Systems, 1999, ISBN: 0-8493-2628-1.) The technical aspects of the DL trip were covered.

But this ambitious program needed more. Generally, engineers in China, particularly younger engineers, knew little or nothing about the IEEE and how it functions, let alone about the IAS. In addition to the technical subjects, expecting a DL to present the broad scope of IAS activities plus information about the structure of IEEE simply was not reasonable. It would not work. As Chapters communications chair, Erling Hesla agreed to handle this part of the program, provided it expanded to include expediting applications for membership and assisting in the organization of IAS Chapters.

With the scope established, the next issue became the schedule. Chen and his counterparts in China agreed that the minimum time for active presentations in each location had to be three full days, four if possible, exclusive of travel time. The first day would give engineers a brief introduction to the IAS and the IEEE (in English, almost always with a translator) followed by the DL presentation (mostly in Chinese, sometimes in English). During the day and at dinner in the evening, there would be opportunities for informal discussions. The second day and evening would follow a similar pattern, with opportunities to ask specific, detailed questions about the IAS and IEEE. The third day, and possibly the fourth, would be a continuation in a lessstructured format as attendees and presenters became better acquainted.

In practice, this turned out to be a highly successful procedure.

Now came the time for the resolution of the financial details of a new, much larger venture than IAS had ever undertaken. Travel to China was not cheap; however, Dr. Aziz Rahman, who chaired the DL program, found a way to fund travel to China, provided lectures were presented in several cities. Various groups of engineers in China agreed to pick up local costs, and Chen covered the costs for his wife, Mae. The money problem was solved. (Going from memory, the total cost to IAS for both representatives for five weeks was under US\$9,000.)

There never was any doubt about the part Chen would play as DL. Engineers knew what to expect from him, they knew him personally or by reputation, they were eager to hear him, and they held him in high regard. The IEEE and IAS, however, were a mystery to most, so much so that it was hard on the first day to know what questions to ask. By the second day, some of the veils had been lifted, and Erling Hesla was expected to know all about everything in the IEEE. Many in the audience who were working on their master's or doctorate degrees needed specific answers on how to obtain technical information and how to submit papers. All wanted to know how to join the IEEE and IAS, the cost, how to transmit payment, the benefits, when the publications would arrive, and many other familiar questions. This was the experience in every city.

Where did the IAS representatives go, and how long were they there? They arrived and spent the night of 18 October 1996 in Beijing. On 19 October, a drive of fewer than two hours took them to Tianjin University, where they stayed until their return to Beijing for the flight to Xi'an for presentations starting on 26 October. On 31 October, they returned to Beijing for lectures and then moved on to Nanjing for a series of presentations starting on 9 November. The last city visited in China was Hangzhou, 14-18 November, over the weekend. The final stop, through 20 November, was with Gilbert K.K. Li and other friends of long standing in Hong Kong, then still a British colony.

Much was accomplished. The indepth, direct contact by the IAS opened the floodgates to global participation in the IEEE so much that, in 1998, Chen and Hesla were honored by the IEEE with the Larry K. Watson Transnational Award "for creating and implementing an innovative technical and administrative partnership program to promote IEEE globalization," an award that redounds to the credit of IAS.

Throughout China, prospective members were gratified to learn that the IEEE is open to all engineers, including those at the beginning of their careers. Engineers in China saw the IEEE as a vital part of their plans to make rapid progress in electrical engineering, both individually and as a group. Some expected membership in the IEEE to double or triple in a few years. Some suggested that, in addition to the destinations on this trip, Harbin and Guangzhou should be considered as soon as practical. Difficulties that had been seen as obstacles were now viewed as problems to be solved.

The IEEE decision to have the Beijing Section cover the entire country now seemed restrictive and ready for modification. The Xi'an meetings were particularly well attended. They were ready to apply for a Xi'an Section, and the Chapter representative carried back 27 membership applications from Xi'an alone (so the applications could not get lost in transmittal). Xi'an showed considerable interest in participating in standards development, reflecting its recognition of the significance of worldwide standards to their industries. Beijing expressed the view that one Section for all of China, compared with many other countries that have several Sections, was a situation to be remedied. In Nanjing too, members expressed a strong interest in establishing a Nanjing Section. Representatives from Shanghai were sufficiently interested in the IEEE to join their associates for the meetings in Nanjing. Hangzhou, which has strong ties with Shanghai, focused more on establishing a Student Branch. To the credit of the organizers in Hangzhou, the abbreviated weekend presentation that had to be fitted into the itinerary rather late in the plans turned out to be highly successful.

All in all, older engineers who had previously worked in Europe or the United States were very appreciative of the active involvement of the IAS; younger engineers were enthusiastic about the opportunities that IEEE and the IAS offered them—to acquire the latest knowledge, to join our professional network, and to contribute technically in the coming years. There were no naysayers in China.

The final stop in Hong Kong was much like an old home week for the presenters. Hong Kong has always claimed a strong IAS Chapter with consistently outstanding leadership and with unique insights into China that other Chapters cannot match. The closing meetings in Hong Kong culminated an outstanding and highly successful tour.

IEEE President Wallace Read followed up with a letter to his counterparts in China, commending the work of IAS. A full report on the trip was submitted to the IAS Board.

Continuing in 1997, the IAS began to seriously expand its intersociety cooperation activities by conducting three major meetings that year. The first was at the IEEE Applied Power Electronics Conference and Exposition (APEC) with the IEEE Power Electronics Society (PELS), leading to inviting the PELS Administrative Committee (AdCom) to join in the second meeting held in Taormina, Italy, with three European associations: Italian Association of Electrical Engineering and Electronics, the Institution of Electrical Engineers, and the European Power Electronics Association. The cooperative themes discussed at these meetings were on organizational and technical aspects of mutual interest to all. The third meeting was arranged with the cooperation of Susumu Tadakuma (IAS member-at-large) and held in August 1997 in Nagaoka, Japan, with the AdCom members of the Institute of Electrical Engineers of Japan (IEEJ)/IAS. This first step with the IEEJ/IAS eventually led to completing the necessary paperwork for establishing a
sister society agreement with the IEEJ/IAS, providing unique membership opportunities and publications access.

### IAS and CONCAPAN

In 1997, Sections in Honduras, El Salvador, Costa Rica, and Panama invited DL Chen to present the 1995 edition of the Bronze Book, Recommended Practice for Energy Management in Commercial and Industrial Facilities. The IAS Board, under the leadership of Caio Ferreira, offered to support a tour combining two-day technical lectures with presentations of IEEE activities, particularly those related to IAS, with the objectives of improving support for existing IAS Chapters and helping to develop new Chapters. Quietly encouraged and assisted by Carlos E. Rodriguez of Panama, the host Sections arranged schedules at the end of October 1997 so that the tour became part of the Convention of Central America and Panama (CONCAPAN) XXVII in Honduras, of dedicated sessions in El Salvador and Costa Rica, and of the silver anniversary of the Section in Panama. Dr. Rahman found a way under the DL program to provide financial support.

From its beginning early in the 1970s as Convención de Centroamérica y Panamá del IEEE, CONCAPAN has enjoyed support from IEEE Sections in all Spanishspeaking countries in the Americas, from Sections in Portuguese-speaking Brazil, and from more distant countries such as Spain. Annual conventions are held on a rotating basis under the management of the host Section with minimal involvement of the parent IEEE organization. Most papers are presented in Spanish with some English; English speakers use English with some Spanish. CON-CAPAN consistently provides an outstanding forum for its members, a forum more readily accessible than conferences held in distant countries.

Kao Chen and participating engineers agreed wholeheartedly that the DL tutorial needed two full days to capture the wealth of knowledge in the *Bronze Book*. In addition to daytime lectures, Kao gave student engineers homework questions to help them understand the subject. Two days of lectures combined with informal discussions turned out to be an excellent way for the DL to add personal insights and for local engineers to become well acquainted with him and with each other.

Technical discussions fully occupied the time of Kao Chen, so information about IEEE and IAS operations was covered by Chapters Communications Chair Erling Hesla. Attendees appreciated presentations on how the IEEE functions, the regional structure supporting the Sections, the technical structure incorporating IAS and other Societies, programs, activities, fees, finances, and more. Members find it difficult to comprehend the complexity of the IEEE, and the members in CONCA-PAN were no exception. One aspect in particular that they appreciated was the offer created and fostered by Clayton Reid of free membership in the IAS for anyone who joined the IEEE at the conference. This membership offer was a successful "first" that IAS supported for several years. As part of the effort to reach out to as many members as possible, IAS manned a popular booth that displayed a variety of informational material-and membership application forms.

For a decade, IAS continued to participate in CONCAPAN through the Chapters Communications chair, to the mutual benefit of local members and of all IAS members. Unflagging support by Mark Harris, Sunita Kulkarni, and others for participation in CONCAPAN programs increased the effectiveness from year to year. DL presentations such as the one introduced by Kao Chen continued outside of CONCAPAN. Cooperation between IAS and CONCAPAN. stimulated the involvement of members in the broad activities of IAS, a benefit of inestimable value that continues to this day.

In 1998, the IAS Executive Board established a new standing committee to be known as the Intersociety Cooperation Committee. This new committee was given responsibility for implementing cooperative initiatives between the IAS and all other IEEE and non-IEEE societies or entities and to serve as an advisory group to the Executive Board on all related matters. In addition, the committee was organized to accept specific projects and/or requests for study made by the Society president. The first major cooperative meeting of this committee was held in February 1998 at APEC. Four IEEE Societies were represented: the IAS, the IEEE Power & Energy Society (PES), PELS, and the IEEE Industrial Electronics Society (IES). The meeting objective was to improve working relationships and communications channels among the attending Societies and to define specific opportunities/action items to be pursued after the meeting. This meeting established the framework for additional meetings held in 1999 and 2000 and lead to the signing of a cooperation agreement among the four Societies-IAS, PES, PELS, and IES-relating to cooperative activities and membership. The agreement provided for joint memberships in all four Societies. It also allowed for joint Chapters, conferences, and publications. A four-Society package price for online member access to each Society's transactions was offered by the four Societies starting in 2001. The agreement was initiated for a renewable three-year term by written consent of the Societies and went into effect for the calendar vears 2001-2003.

As the 21st century unfolded, the IAS had truly become global, and the momentum now rooted in the Society's five-year strategic plan became the primary focus of the Executive Board from 2001 to 2006.

### From 2007 to 2010

One of the first challenges in 2007 was finding a site for the IAS Annual Meeting. The meeting organizers had signed a contract with the Hyatt Regency in New Orleans, but the hotel had been badly damaged during Hurricane Katrina in 2005. For many months, the hotel said that repairs would be completed in time for the meeting. But in February 2007, only seven months before the planned meeting date, the hotel announced that it would not reopen until 2008. Several alternative sites in other cities were considered, but very few suitable hotels were available. Fortunately, the local committee found that the Sheraton New Orleans was open and convinced the Executive Board that the city had recovered sufficiently to host our meeting. The 2007 Annual Meeting was held as originally scheduled and was very successful.

Traditionally, IAS volunteers have done almost all of the administrative tasks for the Society. But by 2000, it was clear that the IAS needed to find a way to help the volunteers and hired Myers-Smith for administrative support. The results were generally satisfactory, but, by 2007, the Executive Board had decided that the IAS might be better served by an administrator who was a member of the IEEE staff. The concept was tested by sharing an IEEE staff member with PELS. In April 2007, Lynda Bernstein was hired as a part-time IAS administrator. Her personality

and skills matched the needs of the IAS perfectly, and at the end of 2008, the IAS Executive Board enthusiastically supported a motion to have her work full time for the IAS.

The first tentative steps toward using an online system to review technical papers began in 2007. Several years earlier, the IEEE had conducted a search for a system that would eliminate the use of paper in the review process. The IEEE selected Manuscript Central (later renamed ScholarOne) and pro-

vided resources to help each technical Society transition to the new system. Many of the IEEE Societies used the same basic process to review all of their papers and were able to start using the system quickly. But the committees in IAS used many different processes to select papers for publication. As a result, we needed to first document our processes and then work with Manuscript Central to modify the system to accommodate the needs of the technical committees. Progress was slow but continuous. In 2008, the Electric Machines Committee transitioned to Manuscript Central. In 2009, the IAS Annual Meeting used Manuscript Central to collect papers for the conference record. In 2010, Louie Powell accepted the newly created position of Scholar-One manuscripts administrator and worked tirelessly to transition all of the IAS technical committees to the electronic system.

Awards provide IAS the opportunity to recognize the achievements of some of our most accomplished members. In 2008, the IAS participated in the establishment of two new awards: the IEEE Medal in Power Engineering and the IEEE PES IAS A.P. Seethapathy Rural Electrification Excellence Award. A significant number of IAS members have received these honors in subsequent years.

Governance emerged as a surprisingly important topic of discussion in 2009. One year earlier, an IEEE com-

**AWARDS** 

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mittee unveiled a set of requirements for the conduct of business at all meetings by all groups within the IEEE. These requirements were informally called the must-haves and nice-to-haves. For the most part, the TO RECOGNIZE rules simply codified the way IAS and nearly all other technical **ACHIEVEMENTS** Societies had convened meetings and passed motions. But one group in the IAS, the IAS Council, had to be modified because it ACCOMPLISHED was not in compliance with all the rules.

The IAS Council appoints Society offi-

cers and certain department chairs. In the early years of the IAS, the council had regular meetings, debated issues, and even had members-at-large. But by the 21st century, the council performed only one function: it ratified the appointment of candidates selected by the Executive Board. Unfortunately, it did so in a way that conflicted with one of the new IEEE governance rules. That rule said that all actions by governing bodies were only effective when a majority of the members cast a vote. Most of the motions of the council between 2000 and 2008 had under 30% of the members voting. After analyzing which groups of council members voted and which did not, the council was reorganized. Since 2010, a majority of the IAS council members have voted. While that solution has been

effective, it may turn out to be temporary-in other IEEE Societies, the elected members of the governing board are chosen by a vote of all the Society members.

The 2007–2008 financial crisis and accompanying economic slowdown had remarkably little effect on IAS conferences and other activities. A few of the conferences lost money, but most did very well. The 2008 Cement Industry Conference had 1,400 attendees, nearly twice as many as two years earlier. APEC had 1,200 attendees in 2007 and 2008 and 2,000 attendees in 2009. The IEEE IAS Petroleum and Chemical Industry Technical Conference (PCIC) attendance averaged 1,000 between 2007 and 2009. Even a new conference, the **IEEE Energy Conversion Congress** and Exposition (ECCE) 2009, did well. ECCE 2009 had 750 paid registrants, 600 papers, and 25 exhibits.

ECCE 2009 was sponsored jointly by the IAS and PELS. The two Societies had been partners in APEC since 1989, but ECCE presented some unique challenges. ECCE was the combination of the PELS Power Systems Engineering Committee Meeting and the portion of the IAS Annual Meeting organized by the four technical committees of the Industrial Power Conversion Systems Department. Those two groups had very different models for organizing technical sessions. During the first years of the conference, there were significant differences in opinion about the best way to arrange the sessions. But both sides worked together and eventually found ways to make the conference operate more effectively. This spirit of cooperation also led to a joint publication with IAS and PELS.

The 2009 IAS Annual Meeting was a much different event from those of early years. The technical committees, which moved from the Annual Meeting to ECCE, organized over half of the technical sessions at the 2008 Annual Meeting. They had also been very active in the organization of the overall meeting. In 2009 and 2010, the Annual Meeting was held in Houston, Texas, to take advantage of a strong local committee and to provide a stable base for rebuilding the meeting. The meeting schedule has been modified several times to find ways to improve the mix

of tutorials, technical sessions, and events. The results have been encouraging. Each year, attendance and financial performance have improved.

Many of the technical committees within the IAS have been in existence longer than the Society itself. At the 2009 Annual Meeting, we celebrated the 100-year anniversary of two committees: the Power Systems Engineering Committee, established in 1908 as the AIEE Committee on General Power Applications, and the Industrial Lighting and Displays Committee, established in 1909 as the AIEE Electric Lighting Committee. But the next year, 2010, marked the end of the Appliance Industry Committee. The Appliance Committee had been inactive for many years prior to 2005 but had a brief resurgence from 2006 to 2008 when it elected new officers and organized several popular sessions at the Annual Meeting. By 2010, there were no sessions and no committee officers, and the IAS Executive Board reluctantly voted to disband the group.

### From 2011 to 2014

The most recent five-year span of IEEE IAS history has taken our Society in some expected—and some less expected—directions. As is typical of any modern organization, particularly a technical one, many changes can be attributed to globalization and others to technology itself, either the technology we serve or the means with which we fulfill our mission.

It is interesting to note that IAS membership levels have remained fairly flat overall, around 10,000 over the last five years. This can be considered a positive outcome as most IEEE Societies are experiencing a slow decline, and some had heralded the digital age as making the Societies superfluous. This result, however, overshadows an obvious undercurrent of continuous erosion in membership in North America, especially the United States (a few percent), compensated by growth elsewhere, between 10 and 15% in Europe and Asia and as much as 30-40% in Latin America, with the latter having started from a lower number. Membership in the United States now accounts for just over 50% of IAS membership.

This shift in global membership is being addressed by and is also due to the attention that has been paid to Chapter health and creation. One of the salient aspects of recent IAS history has been the creation of a number of new Chapters and the launching of a strong Student Branch Chapter program, both at a breathtaking pace. As of May 2014, the IAS has 142 regular Chapters (there were 120 in 2008) and 72 Student Chapters (up from just two in 2008). Mirroring membership in general, Chapter activity in North America has been fairly stable, with all the new growth coming from elsewhere on the globe. New Student Branch Chapters also are formed mostly outside of North America, although there have been a few notable exceptions more recently. Clearly, we see the emergence in many parts of the world of individuals who want to have the same access to technology and share in its development, and they see the IAS as a vehicle to that end. They see local meetings as a way to organize themselves and contribute. In this respect and among many interesting programs, this has resulted in conferences both organized and run by students in Europe and Latin America as well as one recently (2014) in the United States.

IEEE *Xplore* is by far the largest online repository of technical information in electrical and computer engineering, having become almost a monopoly in this regard. While this may change in the future with the introduction of open access (publications that are available to all for free on the Internet, with funding coming from the authors instead of the reader), this is still the case and has had a number of consequences on the management and nature of IAS, some intended and others less so.

First, IEEE *Xplore* has made the need for an online review process necessary across all of the IAS technical committees, a process currently administered by ScholarOne Manuscripts. Another, more important, consequence has been a sharp increase in conferences technically cosponsored by an IEEE Society means that the conference proceedings can be included in the IEEE *Xplore* database, a very strong incentive for many venues. As a result, the neces-

sary growth of conferences, particularly to address new members' needs overseas, has been a relatively easy process for the IAS. A number of regional events, new ones as well as ones with an esteemed local tradition, have been eager to associate themselves with the IAS. Some examples are the International Conference on Electrical Machines (ICEM) in Europe, a conference dating back to the 1970s; the Symposium on Linear Drives for Industry Applications (LDIA); the IEEE Symposium on Power Electronics and Machines for Wind and Water Application (PEMWA); and CONCAPAN in Central America. Another consequence, already largely felt but perhaps not yet to its fullest extent, is the blurring of the lines between various transactions (people now search by keywords, not by title), and even between transactions and conference proceedings, as all of them are accessible together and in the same way.

New technologies do not affect just how IAS delivers services to its members but also the technical content itself. These changes have made it necessary to create three new technical committees:

- the Transportation Systems Committee, which brings together practitioners in the field of transportation electrification
- the Renewable and Sustainable Energy Conversion Systems Committee to address the many happenings in wind, solar, or marine energy
- the Electrical Safety Committee, formed and incubated for many years within the Petroleum and Chemical Industry Committee.

The Electrical Safety Committee has been established as a committee in its own right to allow it to help other industries with the improving but still vexing issue of industrial safety and with the added mission to help emerging nations learn from what has been learned, often the hard way, elsewhere. This committee definitely illustrates a key part of the IEEE mission, i.e., to put technology to the service of mankind, and its creation is a proud achievement of the IAS.

Going back to conferences, the IAS has had a wide and diverse portfolio of technology-based events as well as application-focused venues. The port-

folio remains strong, with some conferences experiencing extraordinary growth [APEC has more than 4,000 attendees now, and ECCE has over 1,400, with the IEEE IAS PCIC and the Cement Industry Technical Conference also seeing record numbers every year], while others stay steady (the IEEE IAS Rural Electric Power Conference, IEEE IAS Industrial and Commercial Power Systems Technical Conference, and IEEE Pulp and Paper Industry Conference, for instance). This healthy portfolio now includes several newcomers. Aside from growth from events existing previously outside of IAS and joining in, these new events have been launched for essentially two reasons: to further our geographical reach and to address new technologies. Concerning globalization, let's mention ICEM (in Europe) and its counterpart in Asia, ICEM Systems, which complement ECCE in North America in terms of electric machine technology. In addition, there is PCIC Europe (organized by a sister organization) and current efforts for a similar event in Brazil, possibly with another one in the Middle East. Concerning technology, let us mention transportation; with the cosponsorship of PELS and the PES, the IEEE Transportation Electrification Conference and Expo (ITEC) was launched, first in North America (2012) and now in Asia (2014), with plans for India in 2016. In this respect, the newly formed Electrical Safety Committee is looking at sponsoring events in India and possibly in Europe as well.

In terms of publications, the last few years have seen a flurry of activity after many stable years. The IAS is now cosponsoring, to various degrees, a number of new journals:

- IEEE Journal of Emerging and Selected Topics in Power Electronics (first issue July 2013), cosponsored with PELS, is a collection of special issues focused on a timely subject
- IEEE Transactions on Sustainable Energy (first issue April 2010), led by PES and technically cosponsored by IAS among others
- IEEE Transactions on Smart Grid (first issue June 2010), led by PES and technically cosponsored by IAS among others

- *IEEE Electrification Magazine*, (first issue September 2013), cosponsored by PES, IAS, and PELS and with the IES, IEEE Intelligent Transportation Systems Society, and IEEE Vehicular Technology Society (VTS) as technical cosponsors
- IEEE Transactions on Transportation Electrification, sponsored by PELS, IAS, PES, and VTS, is in the final stages of approval, with a scheduled launch date of January 2015.

The need for new journals is being fueled by new technologies, with a clear parallel between IAS's new committees on renewable energy and transportation and some of these new publications. Another motivator is the sheer growth in the number of new submissions, many coming from countries or universities that are new or relatively new to this level of research, all facilitated by globalization on the one hand and by the ease of online submission and review on the other.

The IAS is one of the four leading IEEE Societies in terms of standards, and the last few years have seen the overhaul of the famed *Color Books*, now known as, or at least commonly called, the IEEE 3000 Standards Collection. The IEEE 3000 Standards Collection overall includes the same content as the *Color Books* but is now organized into approximately 70 IEEE dot standards that each cover specific technical topics, all of it the result of countless man-hours on the part of many IAS volunteers.

Intersociety collaboration within IEEE Societies continues to expand. In this respect, the IAS is part of a group of five sister Societies comprising PES, PELS, IES, and, as of 2014, the IEEE Dielectrics and Electrical Insulation Society. These five Societies together manage, within electrical engineering, the technical field of higher power and meet regularly at the highest level. Many of the new conferences listed earlier are cosponsored with one or another of these sister Societies.

Looking at the future, it is clear that the current trends of globalization and new technology will continue unabated. This may make it necessary to innovate in terms of knowledge dissemination. When such work could easily be categorized in the past as print media, conferences, or Chapter meetings, new technologies are blurring the lines (everything is on IEEE *Xplore*) and making novel products possible. The old model of tutorials at conferences may soon be just a small part of a vast repository of online Webinars. Perhaps the IAS will promote a community of experts, available online to help or mentor one another. In terms of field of interest, the IAS may soon address new member needs on topics only visionaries can already see.

To address these multiple challenges, the IAS Board held a special retreat in December 2013, with the objectives of looking at needed reforms, including possibly board structure changes, sponsoring new programs and initiatives, and better addressing the needs of underserved regions and under-addressed technologies, all of it to ensure that the next half-century of IAS will be as bright as its first one has been.

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- Thomas A. Nondahl (IAS president 2009–2010), IAS history 2007–2010
- Bruno Lequesne (IAS president 2011–2012), IAS history 2011– 2014
- Erling Hesla (IAS Chapters communications chair), IAS—A "First" in China, IAS and CON-CAPAN.

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IAS



IAS history | mohammad s. islam

# The Awards Department



ith 10,000+ active members from various countries around the world, the IEEE Industry Applications

Society (IAS) is one of the world's largest premium organizations specializing in the global design, development, application, and management of electrical and electronic systems, apparatus, devices, and controls. This is the home of many scholars, researchers, and engineers who are continuously contributing to the engineering community through their invention, services, and leadership to advance the technology to the next generation. The committee recommendation to establish the Awards Department was authorized by the IAS Executive Board on 5 December 1994. The IAS Awards Department began operation in 1995, and Prof. Robert D. Lorenz became the first chair. In 1995, Prof. Lorenz and his team built the Award Department structure, and the first fully functioning department was confirmed by the Executive Board in December 1995. (See "Awards Department Organization in January 2015" for the current organizational structure of the Awards Department.)

The Awards Department was established to manage the overall award activities for the Society and to recognize our members for their outstanding contributions toward research and

Digital Object Identifier 10.1109/MIAS.2014.2361999 Date of publication: 10 December 2014 invention as well as their service to the engineering community. What follows is a description of the awards presented by the IAS:

- the Outstanding Achievement Award
- the Distinguished Service Award
- the Outstanding Young Member Award/Andrew W. Smith Outstanding Young Member Award

### TABLE 1. OUTSTANDING ACHIEVEMENT AWARD RECIPIENTS.

1969	Robert B. Moore	1993	Bimal K. Bose
1970	Charles F. Dalziel	1994	Ray P. Stratford
1971	Donald S. Brereton	1995	C. James Erickson
1972	Boris Mokrytski	1996	Austin H. Bonnett
1973	Robert V. Wachter	1997	Joachim Holtz
1974	Harold Winograd	1998	Donald W. Novotny
1975	Walter R. Harris	1999	Akira Nabae
1976	Ralph H. Lee	2000	Kouki Matsuse
1977	Irvin N. Howell	2001	L. Bruce McClung
1978	Richard Harold Kaufmann	2002	Rik W. de Doncker
1979	F.A. (Tony) Furfari	2003	Robert D. Lorenz
1980	Richard M. Emberson	2004	Hirofumi Akagi
1981	Edward A.E. Rich	2005	Nobuyki Matsui
1982	Anthony C. Lordi	2006	Jacobus Daniel van Wyk
1983	Ion I. Inculet	2007	Caio Ferreira
1984	Russell W. Mills	2008	Paresh C. Sen
1986	Thomas A. Lipo	2009	Kaushik Rajashekara
1988	C. Curtis Herskind	2010	Tomy Sebastian
1989	Donald K. Ross	2011	Thomas Jahns
1990	George W. Walsh	2012	No recipient
1991	Thomas E. Sparling	2013	Muhammad H. Rashid
1992	M. Azizur Rahman	2014	Thomas A. Nondahl Longya Xu

- the Society Prize Paper Awards
- the IEEE Industry Applications Magazine Prize Article Award
- the Society Chapter Award
- the Myron Zucker Undergraduate Student Design Awards.

### Outstanding Achievement Award

The Outstanding Achievement Award, first presented in 1969, honors individuals who have made an outstanding contribution in the application of electricity to industry in accordance with the scope of the Society. The award is presented annually by the IAS (Table 1). The selection committee considers the following criteria:

- invention in the field as exemplified by issued patents
- contribution to the general engineering or scientific basis of the technologies found within the scope of the IAS
- executive or managerial contribution in the organization or operation of enterprises as associated with the scope of the IAS.

Each recipient receives a suitably inscribed statuette and a cash award of US\$5,000.

### **Distinguished Service Award**

The Distinguished Service Award, first presented in 1988, recognizes an individual who has, through dedication and service, distinguished himself/herself to the Society. The award is presented annually by the IAS, and the recipients to date are listed in Table 2. The selection committee considers contributions that may be manifested in the following manner:

- an exceptional administrative, managerial, and leadership achievement
- the proposal and/or implementation of innovative new Society programs
- dedication to the growth and advancement of the Society and/ or its geographic and technical entities.

Each recipient receives an inscribed plaque and a cash award of US\$3,000.

### Outstanding Young Member Award

This award was first established in 1996 as the Outstanding Young

### TABLE 2. DISTINGUISHED SERVICE AWARD RECIPIENTS.

1988	George W. Younkin	2002	Frederick C. Trutt
1989	Richard S. Nichols	2003	Andrew W. Smith
1990	James H. Beall	2004	Dayne Aldridge
1991	E.G. (Al) Kiener	2005	Satish Chaparala
1992	James W. Patterson	2006	Peter Magyar
1993	Daniel L. Goldberg	2007	No Recipient
1994	Eugene J. Fagen	2008	Clayton H. Reid
1995	Lloyd A. (Pete) Morley	2009	No Recipient
1996	John H. Kassebaum	2010	Mark Harris
1997	Edward A.E. Rich	2011	Robert Lorenz
1998	F.A. (Tony) Furfari	2012	William D. Greason
1999	Baldwin Bridger, Jr.	2013	H. Landis "Lanny" Floyd
2000	Donald S. Brereton	2014	Louie J. Powell
2001	Michael J. Foley		

Member Award and was later renamed in 2009 as the Andrew W. Smith Outstanding Young Member Award; it recognizes outstanding achievement and contribution to the profession through involvement in Society activities by an IAS member younger than 35 years of age. The award is presented annually by the IAS. The awardees have been judged to have made an outstanding contribution to the profession in the form of IEEE IAS activities, such as through the authorship of technical papers, IAS Chapter leadership, IAS committee work, conference leadership, and standards working groups. The recipients receive a suitably inscribed plaque and a cash award of US\$1,000 as well as a grant for expenses to attend the IEEE IAS Annual Meeting. The winners are listed in Table 3.

### TABLE 3. RECIPIENTS OF THE OUTSTANDING YOUNG MEMBER AWARD/ ANDREW W. SMITH OUTSTANDING YOUNG MEMBER AWARD.

1996	Christine M. Kent	2006	Burak Ozpineci
1997	S. Mark Halpin	2007	Leila Parsa
1998	lqbal Husain	2008	Nadezhda A. Dvurechenskaya
1999	Kimberly K. Eastwood	2009	Ayman M. EL-Rafaie
2000	Annette von Jouanne	2010	Wei Qiao
2001	Leon M. Tolbert	2011	No Recipient
2002	Giovanna Oriti	2012	Zhi Gao
2003	Michael J. Hittel	2013	Akshay Kumar Rathore
2004	Dan Neeser	2014	Bin Lu
2005	Ganesh Kumar Venayagamoorthy		

### AWARDS DEPARTMENT ORGANIZATION IN JANUARY 2015

Awards Department				
Mohammad Islam Chair Northeast Michigan, R4	Iqbal Husain Eastern North Carolina, R3	Tomy Sebatian Northeast Michigan, R4	Robert Lorenz Madison, R4	
Outstanding Achieveme	nt Award Committee			
Tomy Sebastian Chair Northeast Michigan, R4	Thomas Jahns Member Madison, R4	L. Bruce McClung Member West Virginia, R2	Kaushik Rajashekara Member Dallas, R5	Carlton Speck Member Southeastern Michigan, R4
Distinguished Service Aw	ard Committee			
Robert Lorenz Chair Madison, R4	Lanny Floyd Member Delaware Bay, R2	William Greason Member London, R7	Mark Harris Member Rock River Valley, R4	
Andrew W. Smith Outstar	nding Young Member	Award Committee		
lqbal Husain Chair Eastern North Carolina, R3	Wei Qiao Member Nebraska, R4	Z. George Gao Member Berlin, R8	Burak Ozpineci Member East Tennessee, R3	Tamas Ruzsanyi Member Hungary, R8
IAS Fellows Review Com	mittee			
Tom Nondahl Chair Milwaukee, R4	William Greason Member, MSDAD London, R7	Lucian Dascalescu Member, MSDAD France, R8	Eduard Muljadi Member, MSDAD Denver, R5	Kouki Matsuse Member, MSDAD Tokyo, R10
Hiroaki Ikeda Member, MSDAD Tokyo, R10	John Propst Member, PID West Virginia, R2	Richard Hulett Member, PID Sacramento Valley, R6	Louie Powell Member ICPS Schenectady, R1	Wei-Jen Lee Member ICPS Fort Worth, R5
Ali Asraf Chowdhury Member ICPS Sacramento Valley, R6	Jinliang He Member ICPS Beijing, R10	Emil Levi Member IPCSD UK and Republic of Ireland, R8	Longya Xu Member IPCSD Columbus, R2	Frede Blaabjerg Member IPCSD Denmark, R8
Raja Rajashekara Member IPCSD Dallas, R5	Peter Magyar Member IPCSD Germany, R8	Amr Adly Member IPCSD Egypt, R8	Hamid Toliyat Member IPCSD Houston, R5	Pragasen Pillay Member IPCSD Montreal, R7
Tomy Sebastian Member IPCSD Northeast Michigan R4				

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### **Society Prize Paper Awards**

The award recognizes the best articles published in *IEEE Transactions* on *Industry Applications* in the preceding year based on originality, timeliness, contribution, and clarity. The award includes cash and certificates as follows:

- first place: US\$1,000 and a certificate
- second place: US\$750 and a certificate

third place: US\$500 and a certificate
up to five honorable mention certificates.

### IEEE Industry Applications Magazine Prize Article Award

This award was established in 1996 to honor the author(s) of the best technical article published each year in *IEEE Industry Applications Magazine* based on the following criteria:

- the degree to which the article describes an application topic of current interest to a broad cross section of IAS members
- the degree to which the article content is presented in a manner that is readable by a broad cross section of IAS members
- the reviewer score sheets for each article, when available

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the degree to which the article is consistent with the scope of the IAS.

The award includes cash and certificates as follows:

- first place: US\$750 and a certificate
- second place: US\$500 and a certificate.

### Society Chapter Award

This award recognizes achievements by IAS Chapters. The award is judged based on Chapter attendance, increase in membership, number of meetings, participation in technical conferences, and Chapter presentations at IAS Council meetings. Detailed information about Chapters can be found in the Chapters and Membership Development section.

### Myron Zucker Undergraduate Student Design Awards

Funded by the Myron Zucker Endowment and managed by the IEEE Foundation, this award was established in 1995 to recognize three separate individual students or student teams and the students' associated electrical engineering departments. It is primarily for students enrolled in a bachelor's degree program in electrical engineering, or its equivalent, who receive the highest rankings and approvals of a submitted engineering design project within the scope of the IAS. In selecting a recipient, the IAS Education Department Myron Zucker Grant Committee considers:

the extent to which the solution of the design problem demonstrates the practical application of engineering fundamentals and engineering judgement

- the quality of the written report presentation
- the extent to which an industrial entity, if any, provides appropriate guidance

THE COMMITTEE

**RECOMMENDA-**

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**RIZED BY THE IAS** 

**EXECUTIVE** 

**BOARD ON 5** 

DECEMBER

1994.

and access to an applications environment. The award includes cash and certificates as follows:

- first place: US\$800 cash honorarium and a certificate for the students and US\$500 cash honorarium and certificates for the students' academic department
- second place: US\$600 cash honorarium and a certificate for the students and US\$400 cash honorarium and certificates for the

students' academic department

third place: US\$400 cash honorarium and a certificate for the students and US\$300 cash honorarium and certificates for students' academic department.

In addition, travel grants of US\$6,000 (US\$2,000 maximum per award—to be split equally among team members traveling to the meeting) are awarded for student(s) to attend the IEEE IAS Annual Meeting.

### IAS Fellows Review Committee

The Fellows Review Committee reviews all the Fellow nominations

submitted through IAS every year. The committee includes a chair and several members from different departments who are nominated by

> the chair to review the nominations. Each candidate is evaluated by at least five to six IEEE Fellows who are members of IAS and are familiar with the technical area of the candidate. After the review, the results are consolidated into a single evaluation of each candidate and submitted to the IEEE. The IAS evaluation is based on technical contributions as described in the nomination and endorsements, if any. The evaluation done by the technical society contributes as much as 25 points to

each candidate. An additional 65 points is assigned to each candidate by the IEEE Fellows Evaluation Committee in the following categories:

- up to 40 points for individual contributions and evidence of contributions
- up to 15 points based on the strength of the references and endorsements
- up to ten points for IEEE and non-IEEE professional activities.

Historically, about one-third of all candidates are elevated to Fellow each year.

IAS



# The Chapters and Membership Development Department

y membership, the IEEE Industry Applications Society (IAS) is midsize. As of 1 August 2014, we had 10,796 members. Our official membership development history goes back to 1972 (Figure 1), but there are many Industry and General Applications (I&GA) Group members who joined earlier than that. The spike in 1973 shows the transition from the I&GA Group to the IAS; it is possible that the IEEE did not process the transfer on the membership records until the next annual dues payment cycle, which could have pushed the transfer back by a year or so. It is diffi-

cult to verify this, but, in any case, it is a fact that, based on the official membership list, there are two members who joined the IAS in 1972, and they are the official "oldest IAS members."

Considering the 50-yearlong history of the IAS, one would expect that the majority of the membership consists of longtime members. Quite contrary to that, membership statistics show that 36% of the members joined the IAS during the last five years and 50% during the last ten years (Figure 2). They are the "juniors," while 18% of the members



The number of IAS new member enrollments by year.



The distribution of IAS membership by the year they joined the Society.

belong to the "seniors," those who joined between 1972 and 1989. Among these two groups, there is today's core membership (32%), who joined the IAS during the years 1990–2004 and represents the typical leaders in various organization units.

The IAS is an industrial society not only by name but also in terms of its members: 61% of the membership represents the industrial sector, while the second-largest group, academics and researchers, including students, comprises 17%. The remaining 22% includes various other occupations, government employees, and retirees (Figure 3). The two largest membership groups are members

(56%) and student and graduate student members (14%). Of the IAS members, 51% are from the United



The distribution of IAS members by line of business.



IAS members by IEEE membership grade.

States and 49% from the rest of the world. There is a trend that non-U.S. membership is continuously increasing. Another trend is the growth of student membership from about 5% in 2005 to 14% in 2014. The largest student groups are in Region 8 and Region 10 (38% and 32%, respectively), while North America and Latin America have a smaller student membership, both about the same size (14% and 16%, respectively). The details are shown in Figures 3–6.

### **IAS** Chapters

Member activity is carried out mainly in the local Chapters. There are two types of Chapters, i.e., Society and Student Branch (SB). Both types have two kinds of parent organizations. The main difference between the Society and the SB Chapters is that the Society Chapters, or to use their other name, the technical Chapters, belong to the IEEE Sections, whereas the SB Chapters belong to a



The percentage of IAS members by IEEE Region.



The percentage of IAS student and graduate student members by IEEE Region.



IAS Chapter development history 1964-2014: types of Chapters.

university SB. The other parent organization of both types of Chapters is a Society or several joint Societies.

Chapter development started with the technical Chapters during the formation of the IAS in 1964, while the first student Chapter was formed 30 years later, in 1994. Currently, we are in the midst of a Chapter development boom in student Chapters. As proof, 13 Chapters were launched in 2014, ten student and three technical. In addition, petitions for the approval of one technical and seven student Chapters are in progress as of October 2014.

The oldest technical Chapter is the Central Texas Section, Austin, IEEE Industrial Electronics Society (IES)/Power & Energy Society/IAS/



IAS Chapter development history 1964–2014 by IEEE Region.











Power Electronics Society Chapter (formed 12 February 1964), and the first student Chapter was the Texas A&M University Engineering Tech SB IAS Chapter (formed 1 July 1994). I am pleased to commemorate the first technical and student Chapters outside North America, i.e., the New Zealand North Section IES/IAS Chapter (formed 17 April 1972) and the Escuela Superior Politechnica Del Litoral SB IAS Chapter, Ecuador (formed 18 August 2004).

During the last decade, student Chapters have become the driving power of Chapter development in general (Figure 7) but especially in the IEEE Regions 8, 9, and 10 (Figure 8). This student Chapter development



### The CMD structure.

boom (Figure 9) has resulted in a very specific distribution of Chapters (Figure 10). While the technical Chapters are dominant in North America (Regions 1–7), the numbers of the student and technical Chapters are about the same in Regions 8–10.

Currently, including the Chapters with pending petitions, we have 216 Chapters worldwide. About onethird of the Chapters are in North America (Figure 11), and two-thirds of them outside; about one-third of the Chapters are student Chapters, and two-thirds are technical Chapters (Figure 12).

The full list of the Chapters, containing the date of formation and the current Chapter chair and student Chapter advisor, can be found in "Society Chapters by Region" on p. 11.

### **Department and Committees**

The Chapters and Membership Development Department (CMD)

belongs to the IAS Operating Department, and its committee structure is given in Figure 13.

The CMD chair and two vice chairs manage three committee groups with 19 committees in total, with each committee led by a chair. The majority (18 of 20) of the CMD officers are young members, i.e., of an age below 30.

A traditional part of the CMD Chapter Development Committee is the Chapter area chairs. Each regional Chapter group is led by a Chapter area chair, who is usually an active or past Chapter chair. The organization of the SB Chapter area chairs is different. Currently, we have the following student area chair positions: Regions 1–7 North America, Region 8 Europe, Region 8 Africa and the Middle East, Region 9 Mexico, Region 9 Central America, Region 9 South America, R10 Asia and Pacific East, and R10 Asia and Pacific West. The SB Chapter area chairs are young professionals with student Chapter or SB experience. The list of the CMD staff is given in "Society Chapters by Region" on p. 11.

### Main Chapter, Member, and Conference Promotion Items

The main CMD promotion initiatives are

- a starting subsidy for new Chapters
- the financial support of Chapter projects and technical/social activities
- the Distinguished Lecturer program
- local and regional workshops
- CMD and Chapters annual workshop
- conference travel award programs
- the student conference publication and travel program
- the IAS conference information booth program
- free membership campaigns.

### Chapter and Member Contests and Recognition

The contests and awards presented by the CMD include

- the Outstanding Chapter Award Contest
- the Chapter Web Contest
- the Most Happening IAS Chapter Contest
- the Graduate Student Thesis Contest
- the Outstanding Chapter Member, Project Organizer Award
- the outstanding Chapter Chair Award
- the Outstanding Chapter Advisor Award
- the Outstanding Area Chair Award
- the Outstanding CMD Officer Award.



# The Education Department

he earliest roots of the IEEE Industry Applications Society (IAS) Education Department go back to 1965 when the (then) IEEE Industry and General Applications Society was created. At that time, there was an education committee as one of five committees in the Administration Department. (The Administration Department was one of three staff departments.) In 1979, the Student Activities Committee was added as a standing committee of the IAS Administrative Committee.

Because of a very generous donation by the late Myron Zucker, the Myron Zucker IEEE IAS Student-Faculty Grant Program was established on 12 October 1987. Zucker wished to foster student interest in engineering design as related to industry applications. The goal of the Student-Faculty Grant Program was to encourage engineering students and faculty members to work together on industry application projects. The original program provided up to two US\$25,000 grants per year to a university for a faculty member and a graduate or an undergraduate student to work together on an industry application problem.

In 1990, the Student Prize Paper Contest replaced the Student-Faculty Grant Program. The first winner of the Student Prize Paper Contest was "A 68000-Based Multitasking Digi-

Digital Object Identifier 10.1109/MIAS.2014.2362001 Date of publication: 10 December 2014 tal Electroplating Line Power Supply Controller" by Daniel Doughty and Mark Mackelprang of Arizona State University.

In 1991, the Zucker Grant Committee was formally added as a committee in the Administration Department. This structure, with the Student Activities Committee as a standing committee of the Executive Board and the Education Committee and Zucker Grant Committee in the Administration Department, remained in place from 1991 to 1994.

In 1995, the Education Department was created as one of the six IAS Staff Departments. At that time, the Education Department had three committees: Continuing Education, Myron Zucker Grant, and Student Activities. The Student Activities Committee was responsible for the development and implementation of student-oriented programs, and the Continuing Education Committee was responsible for conducting tutorials and other educational programs to promote the continued education of the IAS membership.

Beginning with the 2000 IAS Annual Meeting, the Zucker Travel Program was established to provide financial support for students to attend the Annual Meeting. Since its inception, well over 100 students have attended the IAS Annual Meeting because of the travel program.

In 2003, the Education Department was restructured to include five committees:

- the Zucker Planning Committee
- the Student Competition Committee
- the Conference Education Committee
- the Asynchronous Education Committee
- the Workshops Committee.

A brief description of each is provided as follows.



The 2013 Myron Zucker Luncheon.

The Zucker Planning Committee is responsible for the financial oversight of the Zucker endowment. Although the Zucker endowment exists within the IEEE Foundation, the IAS is responsible for determining the programs that will be funded, consistent with Zucker's wishes. In addition, it is the intent of the Zucker Planning Committee to ensure that the endowment is maintained so that the Zucker programs can be funded in perpetuity.

The Student Competition Committee represents the Education Department in all student competitions, including activities such as the Myron

Zucker Undergraduate Student Design Contest and the Zucker Travel Program.

Each year, approximately one dozen students are given the opportunity to attend the IAS Annual Meeting through the Zucker Travel Program. The program provides for complimentary conference registration and lodging as well as up to US\$600 reimbursement for travel expenses. Many of the students who were introduced to the IAS through the travel program have subsequently become very involved in the Society.

The Myron Zucker Undergraduate Student Design Contest invites students to submit a 25-page report on their senior design project. The scope is very broad and includes any project related to the theory and practice of electrical and electronic engineering in the development, design, manufacture, and applications of electrical systems, apparatus, devices, and controls to the processes and equipment of industry and commerce. The reports are judged on the basis of the project background and purpose; methodology, development, and analysis; originality; results and conclusions; writing; the IAS scope; and linkage to industry. Prizes are



The winners of the 2013 Myron Zucker Undergraduate Student Design contest at the 2013 IAS Annual Meeting (from left): Jon Lister, University of West Florida, second place: "Design of a GSM GPS Vehicle Tracking System"; Nathaniel Eubanks, Vadim Ilin, and Christopher Hayes, University of West Florida, first place: "Design of a Solar Array Positioning Controller"; Vanessa Rueda and Andrea Perez, Pontificia Universidad Javeriana, Bogota, Colombia, third place: "Battery Powered Electronic Ballast for Fluorescent Lamp with Frequency Control."

awarded for first, second, and third places. Each winner is given a cash award and an IAS certificate of recognition. Each academic department is also given a cash award and certificate of recognition. In addition, the students are given the opportunity to attend the IAS Annual Meeting and present their project at a poster session and at a special student paper session. They receive complimentary conference registration and lodging and also a reimbursement of up to US\$2,000 (per winning project) for travel expenses to attend the annual meeting. In 2014, the design contest was expanded to include two separate categories, team projects and individual projects, to address the fact that, although most universities conduct team projects, there are also many universities that conduct individual student design projects.

The Conference Education Committee deals with all matters related to educational activities conducted at IAS conferences. This has been and continues to be the most comprehensive educational activity within the Education Department. Each year, approximately 100 tutorials are presented in conjunction with IAS-sponsored (or -cosponsored) conferences. However, it is important to note that these tutorials are generally planned, developed, and organized by the individual local conference committees. Without the efforts of these volunteers, this educational activity could not be conducted.

Tutorials are either four or eight hours in length, and they cover a wide range of topics. Local conference committees select topics that are of interest to the attendees of each particular conference. Continuing education units are generally offered with each tutorial.

The Asynchronous Education Committee is responsible for developing strategies and pursuing opportunities related to asynchronous learning. For those not familiar with the term, asynchronous education is online learning outside the constraints of time and location. Consequently, the student can access the information on his or her schedule.

With the restructuring of the Education Department in 2003 came increased interest in pursuing asynchronous educational activities. The first of these activities was the production of the CD tutorial "Introduction to Power Electronics" by Dave Torrey in 2002. In 2006, the IAS sponsored



"Ground Fault Protection in Modern Industrial Distribution Systems" was presented by Rasheek Rifaat at the 2013 IEEE IAS Annual Meeting in Orlando, Florida.

its first IEEE Expert Now module (now eLearning), an update of the very popular "Introduction to Power Electronics" CD tutorial. Since then, the IAS has sponsored or cosponsored eLearning courses in topics including power quality, high-voltage dc transmission, and distributed generation.

The most recent IAS long-range plan focuses on globalization and

education and membership. Increased emphasis in asynchronous education will be a key component in achieving this plan as advancements are made in the online delivery of educational materials. Delivery methods such as IEEE eLearning and IEEE.tv, an Internetbased television network, among others, will be utilized. The Workshops Committee deals with targeted workshops and other nonconference synchronous education opportunities. Workshops are a great way for professionals with common interests to focus on the development of specific skills. One great advantage of workshops is the opportunity to interact with other attendees.



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IAS history | r. mark nelms

# The **Meetings** Department

THE PRESENT

IAS MEETINGS

DEPARTMENT

CAN TRACE

**ITS HISTORY TO** 

THE VERY

BEGINNING

(1965) OF OUR

SOCIETY.

he IEEE Industry Applications Society (IAS) Meetings Department can trace its history to the very beginning (1965) of our Society, when it was

known as the IEEE Industry and General Applications Group. Robert B. Moore served as the first president of the organization, and George E. Schall served as the first Meetings De-

partment chair. Early members of the Meetings Department included John S. Ferguson, chair of the first Annual Meeting held in Chicago in 1966; F.A. (Tony) Furfari, who served as chair of the 1967 Annual Meeting in Pittsburgh, Pennsylvania; and B.C. (Bill) Biega, who was the secretary of the 1966 Chicago meeting and served as chair of the 1968 Annual Meeting.

The first Annual

Meeting was held in Chicago in 1966 concurrently with the National Electronic Conference and offered 21 technical sessions supported by 14 different technical committees. The attendance at the first conference was almost 900 attendees. The long-range plans for the first Meetings Department were to have the Annual Meeting on the even-numbered years in Chicago and elsewhere on the oddnumbered years. This continued until 1972, when the Annual Meeting was held in Philadelphia. After that meeting, the annual meetings were moved around to have different host cities and encourage members from those areas to attend. In 1983, the IAS Annual Meeting was held in Mexico

City-the first time that it was held outside Regions 1-7 (the United States and Canada). A very successful IAS Annual Meeting was held in Rome, Italy, in 2000. With a truly global focus on the applications of electrical and electronic engineering, the conference title was changed to the World Conference on Industrial Applications of Electrical Energy, an extended IAS Annual Meeting.

This was the largest annual meeting ever held. In 2005, the Annual Meeting was held in Hong Kong.

The function and operation of the Meetings Department is to provide assistance to conference organizers on fulfilling the requirements of the IEEE conference policies and procedures, to review and approve budgets, to arrange for advance funding for conferences, and to negotiate memo-

randums of understanding (MOU) between the IAS and other conference sponsors. IEEE policies permit two different sponsorship levels: financial and technical. For financial sponsorship, the conference is financially accountable to the Society, which reviews the budget and arranges for a conference advance. The percentage of the Society's financial stake is defined in the MOU, and the Society receives a portion of the surplus or is liable for a portion on the deficit based on this percentage. For technical sponsorship, the Society has a direct and substantial involvement in the organization of the technical program but no financial involvement. In a given year, the IAS is a financial sponsor of approximately ten conferences and a technical sponsor of about 20 conferences.

The IAS is a financial sponsor of some industry-specific conferences that preceded the formation of the Society:

- The Petroleum and Chemical Industry Committee (PCIC) Technical Conference was started in 1954 and is one of the largest annual IAS conferences.
- The IEEE IAS/Portland Cement Association (PCA) Cement Industry Technical Conference was started in 1959 and has been financially cosponsored by the PCA for a number of years.
- The Pulp and Paper Industry Technical Conference was started in 1956.

Other conferences with financial sponsorship from the Society include the following:



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- The IEEE IAS Electrical Safety Workshop (ESW) held its 21st annual conference in 2014 and is the premier forum for accelerating advancements in workplace electrical safety.
- The IEEE Applied Power Electronics Conference (APEC) was started in 1986 by the IEEE Power Electronics Society (PELS). The IAS and the Power Sources Manufacturers Association became financial cosponsors of the conference in 1991.
- The IEEE Rural Electric Power Conference.
- The IEEE/IAS Industrial and Commercial Power Systems Technical Conference.

The International Electric Machines and Drives Conference was started in 1997, is held in odd years, and is sponsored by the IAS, PELS, the IEEE Power & Energy Society (PES), and the IEEE Industrial Electronics Society (IES).

The IEEE Energy Conversion Congress and Exposition (ECCE), sponsored by the IAS and PELS, was started in 2009. The Industrial Power Conversion Systems Department (IPCSD) moved its technical sessions from the IAS Annual Meeting to this meeting.

- The IAS Annual Meeting was modified in 2009 with the departure of the IPCSD.
- The IEEE Electrical Safety, Technical, and Mega Projects Workshop is always held in Region 7.
- The IEEE Electric Ship Technologies Symposium is held in odd years and is sponsored by the IAS, PES, and the IES.
- The IEEE Transportation Electrification Conference and Expo (ITEC) is sponsored by the IAS, PES, and PELS.

The globalization of the IAS has resulted in tremendous growth in sponsored conferences in Regions 8–10 in recent years. PCIC-affiliated conferences have been held in

have been held in Europe, Brazil, and Mexico. ESWs have occurred in Brazil and India. China hosted ITEC Asia-Pacific in 2014. The IAS has sponsored studentoriented conferences, such as the International Youth Conference on Energy held in Region 8 and the Workshop on Power Electronics and Power Quality Applications

held in Bogota, Colombia, in 2013. Recent technically cosponsored conferences include

- the International Conference on Electrical Machines and Systems
- the International Conference on Optimization of Electrical and Electronic Equipment

- the IEEE International Conference on Sustainable Energy Technologies
- the International Conference on Power Electronics, Machines, and Drives
- the International Conference on Renewable Energy Research and Applications
- the IEEE International Conference on Power Electronics, Drives, and Energy
- the IEEE Power India Conference
- the IEEE/IAS International Conference on Industry Applications
- the International Conference on Electrical Machines
- the International Conference on Power Electronics and Drive Systems
- the International Conference and Exhibition on Ecological Vehicles and Renewable Energies
- the IEEE International Symposium on Diagnostics for Electric Machines, Power Electronics, and Drives
- the International Symposium on Linear Drives for Industry Applications
- the International Symposium on Power Electronics, Electrical Drives, Automation, and Motion
- the Petroleum and Chemical Industry Conference–Europe
- the International Symposium on the Science and Technology of Lighting
- the IEEE Petroleum and Chemical Industry Conference–Brazil
- the IEEE Petroleum and Chemical Industry Conference–Mexico.

SUCCESSFUL IAS ANNUAL MEETING WAS HELD IN ROME, ITALY, IN 2000.

A VERY



# The Publications Department

he responsibility of the IEEE Industry Applications Society (IAS) Publications Department is to operate and

oversee the Society publications and to coordinate IEEE joint publications that are within the scope of the IAS. To date, the Publications Department has had 16 chairs (see Table 1), including eight past presidents. Donald Brereton was the founding department chair, and Ahmed Rubaai is the present chair.

The main sources for this history

IAS policies to further improve the

ranking of IEEE Transactions on Indus-

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THE

COMMITMENT

TO PUBLISH

THE

MAGAZINE

WAS PASSED

BY THE IAS

**EXECUTIVE** 

BOARD

IN 1993.

update are four IAS publications: [1], issued in February 2012 on the occasion of the review of IEEE Transactions on Industry Applications and IEEE Industry Applications Magazine; [2], issued in 1995 on the development of the 30th anniversary of the IAS Annual Meeting; [3], issued in 1984 on the occasion of the 100th Anniversary of the IEEE; and [4], issued in 2012 on the occasion of new

try Applications.

as a stand-alone activity within the Society, the IAS has created a bottom-up approach, whereby publications are driven by the 20 technical committees of the Society, with the Society Publications Department delegated responsibility for bringing together the contributions from those committees to produce a single transactions and magazine in accordance with IEEE principles and standards, serving all members in proportion to their professional and pedagogical needs. The foundation and develop-

Rather than establish publications

ment the of IAS transactions and magazine reflect how the IAS has flourished since its establishment in 1965.

### IEEE Transactions on Industry Applications

The first issue of *IEEE Transactions on Industry Applications* consisted of ten papers and totaled 88 pages. That year, 1965, 444 pages were published. In 2014, 4,200 pages were published, with one issue containing 70 papers and 630 pages. Noticeably, the transactions

has become a much larger publication. There have been six transactions editors (see Table 2) over the 50-year history of the journal. Donald Brereton served as the first editor-in-chief

# TABLE 1. THE PUBLICATIONSDEPARTMENT CHAIRS.

1965–1967	Donald S. Brereton
1968–1969	Irvin N. Howell, Jr.
1970–1971	John F. Cachat
1972	James E. Levett
1973	Boris Mokrytzki
1974	William L. Wachs
1975	Edward A. E. Rich
1976	H. Paul Meisel
1977–1978	Dale B. Cochran
1979–1980	George W. Walsh
1981–1986	Vincent A. Falvo, Jr.
1987–1999	Michael J. Foley
2000–2003	Carlton E. Speck
2004–2007	Mark Weaver
2008-2011	Kevin Peterson
2012–present	Ahmed Rubaai

# TABLE 2. IEEE TRANSACTIONSON INDUSTRY APPLICATIONSEDITORS.

1965–1972	Donald S. Brereton
1973–1974	Robert Loewe
1974–1983	Norman Peach
1983–1996	Edward A. E. Rich
1997–2006	Baldwin Bridger, Jr.
2007–2014	Carlton E. Speck
2015–present	Thomas H. Nondahl

(EIC) when the inaugural issue was published in January 1965. Baldwin "Baldy" Bridger took over as EIC in January 1997. His predecessor was

Edward A.E. (Ted) Rich who held the job for 14 years, 1983–1996. Baldy was EIC for ten years and passed the job to Carlton E. Speck in January 2007. Carl is now in his eigth year as EIC.

### The Move to Online Manuscript Submission

The biggest change in the production of the transactions and magazine was the conversion to an allelectronic online sub-

mission and review process under ScholarOne Manuscripts (S1M). The IAS Executive Board decided to adopt S1M as its peer review management tool in late 2005. The plan was to have the site configured and online by the end of 2006. Unfortunately, S1M was unable to support that plan, and the site did not become available for use until May 2008. S1M has become

THE IAS EXECUTIVE BOARD DECIDED TO ADOPT S1M AS ITS PEER REVIEW MANAGEMENT TOOL IN LATE 2005.

the mechanism by which the Publications Department enforces policies and uniform practices in its peer reviews. Timely review and publica-

tion is a priority for the IAS and was one of the objectives that the IAS version of S1M was designed to accomplish.

Implementing S1M imposed a significant culture change on the IAS. In the early years, everything was done on paper. After the technical committees reviewed papers, the authors of papers approved for publication in the transactions submitted all the necessary docu-

mentation and, beginning in the 1990s, backup electronic files in the form of floppy disks sent to the editor via FedEx or the U.S. Postal Service. When the EIC collected enough papers for an issue, usually around 20 or so prior to 2007, he boxed up everything and shipped it to Piscataway, New Jersey, for the publication process, which took a couple of



The countries with 30 or more IAS publication submissions since 2008.

months of editorial and printing work. Copies were mailed to all IAS members and to other subscribers, such as libraries. The mailing of print copies worked pretty well in the United States and Canada, but mail delivery overseas often took a very long time.

Beginning in the second half of 2008, with the implementation of S1M, papers began being reviewed and transmitted to the editor online through the S1M Web site. However, it was not until late 2011 that the majority of papers arrived this way since it took time for legacy papers to clear out of the system and for the various technical committees to adopt the S1M process for their review activities. Papers arriving via S1M could be immediately processed and exported to IEEE Publications electronically with the advantage that early versions of the papers became available on IEEE Xplore almost immediately. Prior to this, and for papers that continued to be handled by the legacy process during the conversion to S1M by the IAS technical committees, papers were not posted online until after the print copies of an entire issue were mailed.

The legacy process that was used prior to the adoption of S1M did not include any hard deadlines. The IAS implementation of S1M imposes a deadline on every step in the process. One of the many benefits of the change is that S1M provides a rigorous method for tracking papers receiving a revise and resubmit decision, something that did not regularly happen prior to S1M. Currently, all papers are handled via S1M, which has allowed the IAS to substantially reduce the time between the initial submission of a paper and its publication. This has also allowed IEEE Publications to eliminate several weeks from an issue's production schedule.

Louie Powell, the current IAS manuscript administrator, designed the IAS implementation of S1M, developed written step-by-step instructions for each aspect of the peer-review process, and provides oneon-one support to the users. Today, he remains the go-to person to find information and solutions to whatever problems, small or big, are faced by the users.

Since the introduction of S1M, we are continuing to see an increase in the number of manuscript submissions. When we initially set up S1M, we predicted that IAS would have 450-550 submissions per year; in 2013, we approached 800 submissions. We also had more than 1,000 manuscript invitations in 2013, which suggests that the rate of submission will continue to increase in 2014. These numbers reflect submission only for review for IEEE Transactions on Industry Applications and IEEE Industry Applications Magazine-submissions for publications produced jointly with other Societies are not included in these statistics. Our last IEEE Periodicals Review Advisory Committee (PRAC) review was in 2012. Since then, the Publications Department has been compiling data each year in the PRAC format so that we can see the trends of our performance and also help pave the way for our next PRAC review in 2017.

There have been 3,127 original submissions since 2008. Figures 1 and 2 show the geographic diversity of total historical manuscript submissions by the various technical committees based on the country of residence of the corresponding author. Some IAS technical committees are inherently focused on North America by virtue of their technical scope. Note that the fractions of submissions from the individual countries reflect their actual proportionate share of the activity. In addition, included are actual percentages for each of the shares. There are a number of countries (e.g., Argentina) that have only had one submission each, so their approval rate is either 100 or 0%, which is totally meaningless. Currently, there are 163 active associate editors, which is an indication of broad global participation. Figure 2 shows the geographic diversity of the participants.

### IEEE Industry Applications Magazine

IEEE Industry Applications Magazine is 20 years old, as EIC Lanny Floyd has been celebrating this year. The commitment to publish the magazine was passed by the IAS Executive Board in 1993. As shown in Table 3, there have been four magazine edi-



The geographic diversity of total participants.

tors over its 20-year history. John Kassebaun was selected as the first EIC, and the inaugural issue was published in January 1995.

One of the most popular features in *IEEE Industry Applications Magazine* is the "History" column. From 1996 to 2006, it was written by a designated history editor, with guest authors occasionally providing some of the articles. Beginning in 2007, most articles have

# TABLE 3. THE EICs OF IEEEINDUSTRY APPLICATIONSMAGAZINE.

1995–1998	John H. Kassebaum
1999–2004	Andrew W. Smith
2005–2010	Louie J. Powell
2011-	H. Landis "Lanny"
present	Floyd

been written by guest authors, with coordination by the history editor. Since 2005, the magazine has published a tabulation of continuing-education opportunities associated with IAS conferences. This was done to address the needs of the engineering practitioners in IAS who require certified continuing education to maintain professional licensure. Since 2006, each of the six annual issues has been organized around a technology theme. Five themes have been common each year, with the July/August issue having a flexible theme. The peer-reviewed feature articles and, if appropriate, the recurring feature columns align with the designated theme. In 2011, a new feature column, "Memoirs," was added, which provides a one-page personal story of inspiration from a distinguished member of the IAS.

In spite of the Society's historical strength in North America, our geographic distribution of authors shows that our appeal is global, with the demographic biased in favor of Regions 8 and 10. These statistics indicate that the technical authors who appear in IEEE Industry Applications Magazine tend to be from Regions 1-8. That demographic distribution reflects the fact that the magazine tends to publish technical articles that focus more on applications than on research. Like most of the IEEE, a significant fraction of IAS members



Three new IAS-cosponsored publications: (a) IEEE Transactions on Smart Grid, (b) IEEE Transactions on Sustainable Energy, and (c) IEEE Electrification Magazine.

work in industry (either in applications or in industrial research); most of those members reside in the United States or Canada. IAS members in Europe tend to be academics that also have a significant role in industry. By contrast, IAS members in Asia tend to be pure academics, whose papers are more likely to be published in transactions. And like the IEEE in general, Region 9 is underrepresented in the IAS.

### New Publications and Policies

In addition to IEEE Transactions on Industry Applications and IEEE Industry Applications Magazine, the Society has launched five new joint publications with sister Societies: IEEE Transactions on Smart Grid, IEEE Transactions on Sustainable Energy, IEEE Electrification Magazine, IEEE Journal of Emerging and Selected Topics in Power Electronics, and IEEE Transactions on Transportation Electrification (Figure 3). Two IAS-IEEE Power Electronics Society joint transactions issues have already been published.

In 2012, the IAS Board, on the recommendation of the Publications Department chair, founded new policies to further improve the ranking of its publications, particularly that of IEEE Transactions on Industry Applications [4]. In 2011, the transactions ranked 66th out of 244 worldwide journals in the electrical and electronics engineering category. In the narrower "multidisciplinary engineering category," its ranking is 11 out of 90 worldwide journals (and first among IEEE journals). There is another, although less used, metric where the IAS clearly shines, i.e., the "half-life" of its transactions, which is consistently over ten years. This means, in a nutshell, that IAS papers are still read after ten years. Only 11 IEEE publications have such longevity (out of a total of 106). Taken together, there is a clear sign of longlasting quality. However, it may be argued that the shorter-term metrics do not accurately reflect, to the outside observer, what practitioners in

the field of IAS know of the transactions. It is for these reasons that the IAS Board has taken new measures. The goal is to further enhance the professional quality of the IAS transactions, built over time by our predecessors, for the benefit of the next generation of engineers in an increasingly global, diverse, and competitive environment. Importantly, all these measures, although encouraged, will remain voluntary.

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# The Standards Department



ince the 30th anniversary of the IEEE Industry Applications Society (IAS), significant changes have

occurred in the Standards Department. The number of standards sponsored or cosponsored by the IAS has increased significantly, and a greater number of our technical committees are involved in their creation and maintenance. Our active members have continued to receive awards and accolades for their contributions and accomplishments, and we are continually replenishing retiring contributors with new young members from academia and industry.

As an operating department of the IAS, the Standards Department has shrunk significantly in terms of infrastructure-we now operate the department using a structure of the department chair and volunteer ad hoc committees as the needs arise. We believe that this structure allows us to better respond to the sometimes rapid changes that occur in our fields of electrotechnology. In the 20 years since the 30th anniversary, the department chairs have included L. Bruce McClung, Howard Wolfman, Mike Hittel, Dan Neeser, and Mark Halpin. While each chair has applied his unique style to the operation of the department, the gradual shift of activities away from the department and closer to the appropriate bodies of working experts has proven successful at every turn. A good example is the manner in which participation in other national standards organiza-

Digital Object Identifier 10.1109/MIAS.2014.2362017 Date of publication: 10 December 2014 tions is concerned; these IAS representatives are largely appointed through the technical committees in which they work with support and coordination provided only as needed at the department level.

Probably the most influential standards we have produced over the last 20 years are the *Color Books* and Standard 1584. The *Color Books* of

course have long existed, but they have been continually maintained and updated throughout this long period. In addition, three new Color Books were included in the set in the last 20 years: the Yellow Book (902), the Violet Book (551), and the Blue Book (1015). The Violet Book presents recommended practices for calculating short-circuit currents, the Yellow Book deals with electrical safety and maintenance, and the Blue

*Book* is devoted to low-voltage electrical system protection. The *Color Books* have long been one of the most useful standards collections sponsored by the IEEE, and they continue to be used around the world. In the early 2000s, the Industrial and Commercial Power Systems Department, which supports the technical committees developing the *Color Books*, decided that the existing *Color Books* series, consisting of some 5,000 pages of technical literature, had reached a unmanageable size and took action to reformulate the organization of this technical content into a greater number of smaller standards. All content of the *Color Books* will be retained, but it is collected and formatted in different ways in the 3000 series of standards. This work is ongoing at this time.

The work on the Yellow Book likely gave rise to the eventual creation of Standard 1584, which deals with

IN THE LAST 20 YEARS, THE STANDARDS DEPARTMENT HAS SIGNIFICANTLY INCREASED ITS INTERNATIONAL ACTIVITY AND PRESENCE. arc-flash hazard analvsis. This standard has impacted millions of engineers around the globe and may be responsible for countless lives being saved and injuries avoided. Largely driven by experts in our Petroleum and Chemical Industry Committee, this document has led to comprehensive changes in safety practices and management. The same experts involved in this work also participate in the associated National Electrical

Code panels that are responsible for electrical safety and have worked tirelessly to harmonize approaches when they differ.

Numerous IAS members have held leadership positions at the IEEE Standards Association level, including L. Bruce McClung, Ben Johnson, Rich Hullett, H. Landis "Lanny" Floyd, Mark Halpin, Howard Wolfman, and Daleep Mohla. Johnson (2002), Halpin (2006), and Mohla (2012) have received the IEEE Charles Proteus Steinmetz Award for their contributions to IEEE standards

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Carey Cook (2005), Don Koval (2008), Elliot Rappaport (2008), and Don Voltz (2008). The members who have made countless contributions at the working group, subcommittee, and committee level are too numerous to list, but their efforts are solely responsible for the continued success of our standards.

Altogether, the IAS sponsors or cosponsors

more than 100 standards related to electrotechnical applications in industry. Our most active technical committees are the Petroleum and Chemical Industry Committee and the committees with the Industrial and Commercial Power Systems Department. The Cement Industry, Electric Machines, and Industrial Power Converter committees are also active, with the latter coauthoring one of the finest examples of intersociety standards cooperation, Standard 519. which deals with harmonic control.

High-profile activities at the present time include those associated with electric transportation and the smart grid. The emergence of the electric vehicle (in a commercially viable form) has resulted in the need for standardization in many areas, and IAS members are making many contributions. The majority of experts in transportation are active in one of our Society's newest technical committee, the Transportation Committee. These

activities in transportation are closely coordinated with our colleagues in other Societies, such as IEEE Power & Energy, IEEE Power Electronics, and IEEE Vehicular Technology. As the technology matures, we fully expect additional standardization activities to be initiated. IAS members are also heavily involved in standardization

**STANDARDS** 

**SPONSORED** 

OR

**BY IAS HAS** 

**INCREASED** 

activities related to smart grid technolo-THE NUMBER OF gy and application at both the technical and managerial level where activities are coordinated across the whole of IEEE through the IEEE smart grid initiative. COSPONSORED Technical areas include communications, protection and control, switchgear, and substations. SIGNIFICANTLY.

In the last 20 years, the Standards Department (along

with the whole of IEEE) has significantly increased its international activity and presence. At the IAS Annual Meetings held in Rome and Hong Kong, standards workshops played a large role in the conference activities during the meetings as well as at additional seminars held before and after the conferences. Color Book seminars lasting one to five days have been held in many countries including Brazil, India, China, and Italy, and shorter seminars, largely through the IAS Distinguished Lecturer Program, have been held in many other locations. Largely due to the international importance of Standard 1584, entire conferences have been initiated and sustained in Brazil, Mexico, Europe, and India. Gradually, the IAS volunteers involved in standardization are also influencing the work of the International Electrotechnical Commission through participation in both organizations.

IAS



# The Manufacturing Systems Development and Applications Department

ven if the Manufacturing Systems Development and Applications Department (MSDAD) is a rather recent entity within the IEEE Industry Applications Society (IAS), some of its technical committees have a very long story. The MSDAD was created in 1993 by a merger between the Industrial Utilization Systems Department (IUSD) and the Manufacturing Industries Department (MID). The IUSD was formed in 1977 and the MID in 1990, but one of the MSDAD technical committees dealing with lighting is one of the oldest entities; it was created in 1909, well before the IEEE.

At the time of its creation, the MSDAD accounted for four technical committees: the Production and Application of Light Committee (PALC) created in 1909; the Electrostatic Processes Committee (EPC) created in the late 1940s; the Appliance Industry Committee (AIC) created in the 1950s and transferred to the MSDAD in 1993; and the Industrial Automation and Control Committee (IACC), some of whose initial components have been traced back to 1987.

Today, 23 years after the MSDAD's creation, the department has been deeply restructured. The AIC, after several years of inactivity, disappeared in 2012. PALC decided,

with the encouragement of Prof. Ikeda and under the chairmanship of G. Zissis, to enlarge its domain of activities to displays and, in 2006, it became the Industrial Lighting and Displays Committee (ILDC). During that period, the EPC and IACC continued and amplified their respective activities.

Historically, the ILDC treats those matters in which the dominant actor is the application of electrical energy into light. Over the last 20 years, the committee has brought increased activity in the field of production and the application of light, which was caused by the rapid advance of technology in general, by greater awareness of economy, and by

energy conservation in particular. This committee has evolved in name and purpose as lighting technology and its requirements have changed over the years. However, this lighting group has managed the presentation and publication of lighting papers in its parent organization since its formation to the present day. The arrival of solidstate lighting and innovative display technologies suggests a bright future for the ILDC.

The IACC strives to advance the theory, standards, and practice of

industrial control as related to the design, operation, and installation of equipment. The IACC relates to manufacturing and factory automation, including the application of industrial electrical and electronic devices, systems, and methods to the conversion, regulation, and utilization of electrici-

TODAY, 23 YEARS AFTER THE MSDAD's CREATION, THE DEPARTMENT HAS BEEN DEEPLY RESTRUCTURED.

ty for the control of industrial processes, machinery, and heating. Included are applications of transducers, sensors, power electronics, motor control, drive systems, programmable logic controllers, distributed control systems, computers, robotics, vision and control systems software to machines, and manufacturing processes.

The EPC deals with electrostatic phe-

nomena: coronas and gas discharges, gas and liquid breakdown, dielectrophoresis, electric fields and biological cells, charged particle physics, electrohydrodynamics, electrofluidization, electrostatic discharge/electric overstress, corona chemistry, computational electrostatics nanoelectrostatics, and electrostatic measurements. Applied electrostatics includes static elimination; electrostatic hazards; electrostatic spraying; electrostatic precipitation; electrophotography; electrostatic transducers, motors, and

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sensors; electrostatics in polymer processing; gas discharge chemical reactors; electrostatic coating; electrostatic separation; and high-voltage power supplies.

Two of the three committees (the ILDC and IACC) have their regular meetings every year during the IAS Annual Meeting, and each time between ten and 14 technical sessions are organized during this event. The EPC decided to have its annual meeting every second year with the IAS and in the interval within the Elec-

trostatics Society of America conference. All three committees are very active; they regularly organize technical co-

sponsored events worldwide followed

by several hundred scientists. Several

times, our committee has proposed

and organized very successful half-

and full-day tutorials during IAS An-

nual Meetings. We can mention as an

example the full-day tutorial on the

technology of light sources organized

# THE MSDAD IS STILL EVOLVING.

by the PALC in 2000 in Rome, Italy, with a record participation of more than 50 people from industry and academia.

The MSDAD is still evolving; today, negotiations are taking place with a new group dealing with optomechatronics and adaptive-controllable optics to create a new technical committee for this department.

IAS



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IAS history g.s. peter castle and william d. greason



# The **Electrostatic Processes** Committee

cesses Committee (EPC) was originally formed as a result of the widespread interest and activity in the application of electrostatic precipitation to air pollution control. The first meeting of the committee was organized by Prof. Gaylord Penney of Carnegie Mellon University (inventor of the Westinghouse Precipitron). After two years, he arranged for the committee to be structured under the American Institute of Electrical Engineers (AIEE) Committee on Electronics. Known as the Subcommittee on Electrostatic Processes, its first meeting was held in January 1949 as part of the AIEE

he Electrostatic Pro-

midwinter meeting in New York. The committee grew during the 1950s. Annual meetings were held, with the majority of technical articles dealing with electrostatic precipitation along with the first of papers describing the Xerox process (commercialized by Haloid Corporation) and demonstrations of practical electrostatic spraying equipment.

Following the 1963 amalgamation of the AIEE and the Institute of Radio Engineers into the IEEE, the EPC experienced a period of change. Initially, it held its sessions as part of the IEEE Power Group Annual Meetings, and in 1968, the sessions were held as part of the Industry and General Applications (I&GA) Group, later to

Digital Object Identifier 10.1109/MIAS.2014.2362020 Date of publication: 10 December 2014 become the Industry Applications Society (IAS). In the early years of its association with the I&GA Group, interest in the EPC declined for a few years but was followed by a period of rapid growth due to the active promotion of the subject of electrostatics by a dedicated group of individuals representing both academia and industry. Prominent among these were Prof. Penney, Ion I. Inculet of the University of Western Ontario, Charles Gallo of Xerox, and Sam Hawke of Battelle Memorial Institute.

During the 1970s, there was a broadening of subject matter, including electrophotography, electrical coronas, and applied electrostatics, with an expansion into the international audience. Electrostatics became recognized as an academic discipline with important industrial significance. In the years that followed, the EPC held its technical sessions

as part of the IAS Annual Meeting. Typically, eight paper sessions were held; papers were published in the proceedings of the Annual Meeting and then peer reviewed for possible publication in *IEEE Transactions on Industry Applications*.

Some other events of significance also occurred in this period. In 1975, *Journal of Electrostatics*, the first international journal devoted to the field, was established. In 1969, A.D. Moore spearheaded a movement that led to the establishment of the Electrostatics Society of America (ESA). This society held its initial meeting in 1971 in Albany, New York, which was jointly sponsored by the American Meteorological Society. In the years immediately following the formation of the ESA, the two major electrostatics groups in North America, the EPC and ESA, tended to live in splendid isolation. The two organizations

BETWEEN SIX AND EIGHT TECHNICAL ARTICLE SESSIONS WERE TYPICALLY HELD AT THE EPC MEETINGS.

appealed to somewhat different interests, although electrostatics was clearly a common theme for each.

It is of historical interest to note that Prof. Moore differed with the IEEE in its definition of electrostatics, which is "the branch of science that treats the electric phenomena associated with electric charges at rest in the frame of reference." The ESA

adopted a more relevant definition: "the class of phenomena recognized by the presence of electrical charges, either stationary or moving, and the interaction of these charges, this interaction being solely by reason of the charges and their positions and by not reason of their motion." In practical application, this means a process is governed by electrostatics when the electric field predominates over magnetic field effects. In electric circuit terms, this implies that the ratio of voltage to current is very high; electrostatic devices can simply be thought of as having very high impedance.

Within the IAS, the EPC was originally part of the Industrial Utilization Systems Department and then became part of the Manufacturing Systems Development and Applications Department in 1993. Around 2006–2007, a number of committees under the Industrial Power Conversion Systems Department (IPCSD) decided to develop closer ties with the IEEE Power Electronics Society and its Power Electronics Specialists Conference (PESC). The Energy Conversion Congress and Exposition (ECCE) was developed to include all of the interests of the IPCSD Committees (Electric Machines, Industrial Power Convertor, Industrial Drives, and Power Electronics Devices and Components) previously presented at the IAS Annual Meeting along with the corresponding interests that had been previously pre-

sented at PESC. The first ECCE was

held in 2009, and it is now held annu-

IN 2003, THE EPC AND ESA EXPERIMENTED WITH A JOINT CONFERENCE HELD IN LITTLE ROCK, ARKANSAS. ally. The EPC has remained a part of the IAS Annual Meeting.

In 2003, the EPC and ESA experimented with a joint conference held in Little Rock, Arkansas, which was followed in 2006 by the first full joint meeting sponsored by the EPC, ESA, the Institute of Electrostatics Japan (IEJ), and the French Society of Electrostatics (SFE) and held in

Berkeley, California. This showed the attraction of the concept, and a second joint meeting followed in Boston in 2009, with a third held June 2012 in Cambridge, Ontario, Canada. The latter two were sponsored by the EPC, ESA, IEJ, SFE, and the International Electrostatic Assembly. The joint program format has proven to be very successful and features oral presentations, poster presentations, and demonstration workshops. The meetings feature presentations offered by participants from many countries and attract high attendance, with good representation from students and young researchers.

To be complete in this historical perspective, it is important to acknowledge those who have served as chair of the EPC; this information is presented in Table 1.

### **The Field of Electrostatics**

Electrostatic processes are the basis of many important engineering applications. As with any technology, there are mature, developing, and emerging fields. Some examples of maturing areas include electrostatic precipitation, printing and copying, and painting. Future applications can be predicted by considering some of the main characteristics of electrostatic forces. Such forces have an unequaled ability to control the trajectories of particles in the size range from millimeters to nanometers. The reason for this is that when compared with various mechanical forces, particularly that of gravity, the electrostatic Coulomb force becomes dominant for very small particles. This is usually quantified through the charge-to-mass ratio

TABLE 1. THE EPC CHAIRS.		
Term	Chair	Affiliation
1947–1952	G.W. Penney	Carnegie Mellon University
1952–1957	H.J. White	Research Cottrell
1958	G.W. Hewitt	Westinghouse
1964–1967	E.J. Coe, Jr.	Joy Manufacturing
1967–1971	S.A. Hawk	Battelle Memorial Institute
1971–1973	K.W. MacKenzie	Mahon Industries
1973–1975	G.S.P. Castle	The University of Western Ontario
1975–1977	C.D. Hendricks	University of Ilinois
1977–1979	C.F. Gallo	Xerox
1979–1981	G. Fritz	Eastman Kodak
1981–1983	J.K. Edwards	Eastman Kodak
1983–1985	W.D. Greason	The University of Western Ontario
1985–1987	T.B. Jones	University of Rochester
1987–1989	K.S. Robinson	Eastman Kodak
1989–1991	C.E. Speck	General Motors Research
1991–1993	A.A. Elmoursi	General Motors Research
1993–1995	J.S. Clements	Appalachian State University
1995–1997	R.J. Turnbull	University of Ilinois
1997–1999	S. Jayaram	University of Waterloo
1999–2001	J. Seyed-Yagoobi	Illinois Institute of Technology
2001–2003	T. Yamamoto	Research Triangle Institute
2003–2005	M.K. Mazumder	University of Arkansas
2005–2007	L.D. Dascalescu	University of Poitiers
2007–2009	T. Oda	University of Tokyo
2009–2011	N. Grass	Siemens
2011–2013	A. Mizuno	Toyohashi University of Technology
2013– present	R. Sharma	University of Arkansas

(Q/M), which provides an indication of the ratio of the electrical force for a given electric field strength to the gravitational force. Since charge is dependent on surface area (radius squared) and mass is a function of volume (radius cubed), the ratio varies inversely with size, showing that the smaller the particle, the more significant the electric force becomes. Since the force of gravity is constant, the electrical force can be directly controlled in magnitude and direction by simply varying the electric field and its orientation. An additional advantage is that it is very energy efficient since the electrical force acts only upon the charged particle and the surrounding medium is unaffected.

A review of technical paper topics presented at EPC's annual conferences for the past ten years yielded the following profile, with the information presented in order of descending number of papers on the particular topic:

- nonthermal processes for the removal of pollutants
- instrumentation
- measurement/sensors
- electrohydrodynamic pumping
- corona
- triboelectrification
- separation
- discharge phenomena, including breakdown
- electrostatic discharge
- precipitators
- aerosols
- charging processes
- spraying
- coating
- materials
- particles
- nanoscale phenomena
- dielectrophoresis
- static control
- Mars applications
- sterilization
- electrospinning
- microelectromechanical systems (MEMS)
- liquid electrification
- electroporation



The number of technical papers presented at the EPC sessions, entered into the review process, and published in *IEEE Transactions on Industry Applications*.

- electrophotography
- hazards.

Between six and eight technical article sessions were typically held at the EPC meetings, which produced a great contribution of knowledge to the field of electrostatics. See Figure 1 for a summary of the number of papers published in the conference proceedings along with the number of papers submitted for review along with those finally accepted for publication in *IEEE Transactions on Industry Applications* for 1983–2013.

The EPC established a rigorous peer-review process of its papers for possible publication in the transactions-before 1972, IEEE Transactions on Industry and General Applications and, after the name change in 1972, IEEE Transactions on Industry Applications. W.D. Greason served as the chair of the Paper Review Committee from 1983 to 2007; K. Adamiak is the present chair. To recognize exceptional articles, the James Melcher Prize Paper Awards were implemented in 1994 followed by the Innovation and Creativity Prize Paper Awards in 2004. It is interesting to observe in Figure 1 the dramatic fluctuations in the numbers of articles coinciding

with the three-year cycle of the joint meetings, very clearly showing the popularity of these meetings.

As the feature size of devices continues to be reduced, the field of electrostatics will become more important and find new applications. Some obvious areas include the field of nanoscience/nanotechnology, including MEMS, biotechnology, and ultrafine particles. The work will include the study of fundamentals and applications driven by technical requirements based on society's changes and needs.

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# The Industrial Automation and Control Committee

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he Industrial Automation and Control Committee (IACC) is one of the three committees under the Manufactur-

ing Systems Development and Applications Department (MSDAD) of the IEEE Industry Applications Society (IAS). The Machine Tool Committee had evolved into the Machine Tools, Robotics, and Factory Automation Committee by 1987. In 1992, it became the Applied Automation Committee. In 1993, it was combined with

the Industrial Controls Committee to create the IACC, a part of the MSDAD. Electric Space Heating and Air Conditioning disappeared as a technical committee by 1985. It became a part of the Industrial and Commercial Power Systems Department (ICPSD) as a technical committee in the late 1970s or early 1980s and then became a subcommittee of one of the other

ICPSD technical committees and finally disappeared by the mid-1980s. Around 1995, it became a part of the IACC as a subcommittee.

The executive members of the IACC consist of a chair, vice chair, secretary, and past chair. A nomination is called

Digital Object Identifier 10.1109/MIAS.2014.2362022 Date of publication: 10 December 2014 only for the secretary position, and one candidate is elected first by the executive committee and then ratified by the general members of the IACC during the IAS Annual Meeting. After two years of serving as secretary, he or she is automatically moved to the vice-chair position for two years, the chair position for two years and, finally, the past chair position for two years. The current vice chair of the IACC served as a papers review chair for *IEEE Transactions on Industry Applications*, the chair of the IACC served as the technical committee

chair for the IAS Annual Meeting, and the past chair served as a nominating committee chair. The annual general meeting of the IACC is held during the IAS Annual Meeting. Before the creation of the Energy Conversion Congress and Expo (ECCE) in 2009, the IACC had four technical sessions with 25-28 technical papers presented at the IAS Annual Meeting.

I have been associated with the IACC since 1998. I attended the IAS Annual Meeting for the first time in 1998 in St. Louis, Missouri. At that time, Muhammad Rashid was the IACC chair. I was encouraged by Ahmed Rubaai to join the IACC general meeting. Around 15 people attended that meeting. Now the IACC has approximately 60 general

members around the world, and 30–40 people usually attend the Annual Meeting. In addition to Dr. Rashid, others who have served as chair of the IACC are Ahmed Rubaai, Takoi Hamrita, David Kankam, Malik Elbuluk, Marcelo Simoes, myself, and the current chair, Abdul Ofoli. In 2007, at the request of Rubaai, I agreed to be nominated for the IACC secretary position and was elected. Before 2011, the review process of IACC-sponsored technical papers was done manually based on e-mail communications.

In 2011, when I became the IACC chair, the review process was made fully online with the help of the IACC secretary at that time, the late Benjamin Blunier. Unfortunately, immediately after introducing the online paper review system, Dr. Blunier passed away in 2011. The IACC has been using the same online review system through the open conference system support. Dr. Rubaai imitated the best paper award for the IACC papers presented in the IAS Annual Meeting, which was later expanded to three best paper awards. In 2009, when some committees left the IAS Annual Meeting and joined the ECCE, the IACC found the opportunity to grow and decided to stay with the IAS Annual Meeting after a long debate. In 2011, the number of papers increased by around 100% as compared to 2010. Now, the IACC has seven to eight technical sessions with seven papers in each session.



# The Industrial Lighting and Display Committee

he Industrial Lighting and Display Committee (ILDC) congratulates the IEEE on its 50th anniversary. The ILDC is one of the oldest committees in the IEEE, being over 100 years old and a seed committee for the IEEE Industry Applications Society (IAS). This committee has evolved in name and purpose as lighting technology and its requirements have changed over the years, but it has managed the presentation and publication of lighting papers since its formation to the present day.

The number of committee members has grown from a handful initially to nearly 60 at present, with half typically active in the yearly conference. The "Lighting Committee Chair List" lists the many chairs of the lighting committee, while the "Lighting Committee History, Name, Parent Group, and Anniversaries" provides some of the lighting committee's organization history since its founding in 1909. Several papers published in the past [1]-[3] thoroughly detail the early days of the lighting committee and lighting and are sources for some of the material highlighted here. This article additionally details the last 40 years.

Commercial lighting during the 1800s consisted of carbon and lowpressure-gas glow and discharge arc types. Carbon filament incandescent



The ILDC in Tampa, Florida, in 2006.

lamps with efficiencies of fewer than 3 lm/W were developed in 1879 and commercialized onward. Early electrical power and its distribution evolved primarily to support lighting. Tungsten incandescent became practical in 1910. This lighting committee was formed in 1909 to support the developing incandescent activity. Groups such as the Illuminating Engineering Society (IES) and American National Standards Institute shared many of the same members and were focused on generating many lighting standards and disseminating information on lighting to standardize and allow for the controlled evaluation of the developing lighting products.

Roadway and architectural use of lighting became popular in the first quarter of the 1900s, which kept this committee busy. Hot cathode mercury and neon lamps were popular. The properties of ultraviolet (UV) and infrared were being explored. World War I made use of lighting in highpower searchlights and for sending coded messages. Lights were also used for celebrations. In 1929, the incandescent lamp was 50 years old. By the early 1930s, modern high-pressure mercury and sodium lamps were becoming common and, by the late 1930s, fluorescent lamps had pleasing colors. By the 1930s, bulbs were made by machines and not slowly by hand. Chemical and xenon photoflash lamps appeared. In addition, in 1936, blackbody radiation was adopted as the primary lighting standard. The science of seeing by light was maturing. By 1940, the automotive sealed-beam headlamp had been developed, and fluorescent lamp color and performance continued to improve. World War II further drove lamp development, and high-pressure sodium was used to illuminate roads. By the 1950s, incandescent had added halogens to improve life and brightness. This lighting group continued to work on standards and papers.

The use of transistors in lighting circuits increased from the 1960s onward, shrinking the ballast size and weight. Metal halide lamps were developed, and magnetic ballasts began to be reduced in size through mathematical optimization. The cost of lighting started to be an issue. Computers were used to help design lighting systems. Transistor control

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### LIGHTING COMMITTEE CHAIR LIST

(Transitio	n month changes)
1909_1910	WI Robb
1910-1912	Peter lunkersfeld
1012_1013	W C L Falin
1012 1014	
1713-1710	
1910-1921	E.C. Clewell
1921-1925	G.H. Stickney
1925-1928	P.S. Miller
1928–1929	B.E. Schackelford
1921–1931	G.S. Merrill
1931–1933	W.T. Blackwell
1933–1935	J.W. Barker
1935–1937	A.L. Powell
1937–1939	Robin Beach
1939–1941	D.W. Atwater
1941–1943	E.M. Strong
1943–1945	W.C. Kalb
1945–1947	S.G. Hibben
1947–1949	Harris Reinhardt
1949–1951	E.H. Salter
1951-1953	R.C. Putnam
1952-1955	R.L. Oetting
1955-1957	LE Dickerhoff
1957-1959	D.W. Rowten
1959_1962	
1962-1964	R L Wissokor
1061 1067	Claude H Burns
104-1707	L Eichman
1707-1707	
17/0	D. M. Malfranana
19/1-19/2	
19/3	
19/4-1980	E.G. Klener
1981-1982	K.I. Risberg
1983-1984	Kao Chen
1985-1986	D.K. Ross
1987–1988	T.K. McGowan
1989–1990	J.D. Stolsheck
1991–1995	E.E. Hammer
1996–1998	Warren Anderson
1999–2000	Laszlo Laskai
2001–2002	Francis Dawson
2003–2004	Gunther Loehman
2005–2006	Bill Peterson
2007–2008	Georges Zissis
2009–2010	Jo Olsen
2011-2012	Sounil Bhosle
2013-2014	Ray-Lee Lin
2015-2016	Kavo Suzuki, plannec
2017-2018	Marcos Alonso.
20.0	planned
	plaining

circuits began to manage ballasts. High-frequency, 20-kHz fluorescent ballasts provided smaller, more efficient lights. Light-emitting diode (LED) indicator lamps arrived, but it would be the end of the century before they were a serious light source. The American Institute of Electrical Engineers (AIEE) and the Institute of Radio Engineers (IRE), having nearly

## LIGHTING COMMITTEE HISTORY, NAME, PARENT GROUP, AND ANNIVERSARIES

1884	AIEE first formed
1906	IES first formed
1909	AIEE Meeting and Paper Committee/Electric Lighting
	Committee, Lighting Committee First Formed
1910	AIEE Electric Lighting Committee
1912	IRE first formed
1913	AIEE Electric Illumination Committee
1914	AIEE Electric Lighting Committee
1924	AIEE Production and Application of Light Committee (PALC)
1948	AIEE General Applications Division/PALC
1959	AIEE General Applications Division/PALC, 50th Anniversary
	of Lighting Committee
1963	AIEE Industry Division/PALC
1964	AIEE and IRE combine into the IEEE
1964	IEEE Industry and General Applications Group/PALC
1972	IEEE IAS PALC
1977	IEEE Industrial Utilization Systems Department/PALC
1977	IEEE IAS PALC
1993	IEEE IAS Manufacturing Systems Development and
	Applications Department (MSDAD)/PALC
2006	IEEE IAS MSDAD ILDC
2009	IEEE IAS MSDAD ILDC, 100th Anniversary of Lighting Committee
2014	IEEE IAS MSDAD ILDC

the same responsibilities, combined in 1964 to become the IEEE. The lighting committee was in the midst of all this activity.

The 1970s saw the use of lead/lag ballasts to improve power factor (PF) and silicon controlled rectifiers (SCRs) for dimming use. The energy shortage in 1974 became a transition year, where energy costs started rising after continually dropping in prior years. Lighting would never be seen the same way. Induction fluorescent saw a lot of activity in this decade, but its day was still to come. Lighting displays were in their initial research and development (R&D) stages and would become a part of the lighting committee in the next century. Lighting use was being studied at airports, under water, on farms, in warehouses, in tunnels, on bridges, and everywhere else. There were many papers to manage. The lighting committee now included members from lamp manufacturers, users, and consultants, and the lighting group now impacted the National Electric Code, the Federal Aviation Administration, and national energy conservation. In the late 1970s, UV exposure from broken outer high-intensity discharge (HID) lamp jackets became a concern. Relighting programs to save energy and operating cost topics became

popular. In 1979, the lighting group rewrote its bylaws to account more for conservation. They also continued to work with the IES in developing lighting standards especially in the area of conservation.

Many lighting conservation papers were presented at the annual convention in 1980, including the very first Chinese IAS lighting papers, which focused on energy conservation. The use of control computers and controllable ballasts became popular. In the early 1980s, screw-in compact fluorescent lamps appeared. At first they were heavy, large, and expensive, and many used magnetic ballasts and glow bottle starters, but by the end of the 1980s, they were lightweight and used electronic ballasts. These compact fluorescent lamp integrated (CFLi) lamps were close to the size of traditional incandescent lamps and were being marketed as replacements, but many burned up at the end of their life. The first lamps had preheat circuits, high PF, turn-on delays, and warm-up times. Power company rebate programs largely drove the initial CFLi marketing.

In the 1990s, metal halide lamps started using ceramic arc tubes to reduce color shift with age, and squarewave electronic ballasts to power them became common. Incandescent lamps had been using halogens to extend tungsten filament lives for decades. Sequence start ballasts were able to extend fluorescent lamp life to 60 kh. RF-induction-powered fluorescent had become real products with lamp/ballast lives rated to 100 kh. CFLi rebate programs ended, and these lamps became instant start with PFs of 0.5 to lower cost. Low-cost CFLi lamps selling for fewer than US\$3 began to be made in Asia. The Energy Star program set up a category for CFLi lamps. Consumers were starting to be concerned about the use of mercury in fluorescent lamps, and recycling programs were operating. LEDs continued to become more efficient with many colors available. Operating several different color LEDs together could result in a somewhat white source; however, the color rendering index (CRI) was very low.

By the end of the century, traditional lighting was becoming mature, and the older founding engineers were retiring. R&D labs were downsizing. Major lighting companies reduced their technical paper output. The number and quality of papers began to fall off. In the early 1990s, the lighting committee, which was the first IAS committee, had shrunk to a couple of active members, while the backlog of papers to manage was near 100. Many of the electronic engineers in the IES switched to the IAS around the end of the 1990s to try and keep as many lighting electronic papers in one conference as possible. This author joined the migration in the 2000s. More papers were coming from Asian and South American colleges and industry. Many papers were part of graduation programs, and publication delays were not acceptable. The requirements on the lighting committee were changing as the decade came to a close. The committee needed to rejuvenate itself, which it did during the late 1990s and into the 2000s, and it caught up on papers.

As the 2000s arrived, the lighting committee was mostly managing papers for *IEEE Transactions on Industry Applications* and *IEEE Industry Applications Magazine* as it regrouped. Typically 8–15 papers were being published per year, and almost twice as many were being presented at the yearly conference. Many of the papers were on the maturing lighting displays. In 2006, the lighting group changed its name from the PALC to the ILDC, expecting



The PALC (ILDC) Salt Lake City, Utah, Tutorial in 2003.

continuing lighting display activity. See "Lighting Committee History, Name, Parent Group, and Anniversaries" for details. In addition, during the early 2000s, the committee rewrote its scope and, in fact, rewrote its entire operating guidelines. Since 1990, the chair had been serving two years, and this became a permanent rule. With a lighting membership of nearly 60 and conference attendance of about 30, staffing the committee has continued successfully. Paper management is still a primary task.

Most papers in the first decade of the 2000s came from outside the United States. Blue LEDs combined with phosphors were generating reasonable white light, but the price was high. A single LED package may have many dozens of smaller LED chips connected in series and parallel combinations on the substrate to generate powers as high as 5 W. Heat was their enemy. Many products were manufactured in Asia to keep costs low. U.S. lighting companies scrambled to catch up. There was increasing concern about throwing away electronics when an integrally ballasted lamp dies. Papers proposing returning to reusable magnetic ballasts appeared. Towns learned to save on lighting costs by just turning off the lights. This had a ripple effect on lamp production and development, which is already mature. By the end of the first decade of the 2000s, manufacturing R&D of traditional lamps mostly came to an end and the lighting industry shifted to nearly unlimited-life LED lamps whose efficiencies with ballasts were exceeding 80 lm/W. Compare that to the original incandescent's 3 lm/W that struggled to last a month.

During the second decade of the 2000s, the government starts to ban low-efficiency lamps such as common incandescents; low-wattage lamps are disappearing from store shelves, and incandescent plants and support plants close. The weakening market for HID also caused plants to close. Induction fluorescent lighting continued in its special higher-cost market. Many LED light sources are outsourced form Asia, taking the technology to that part of the world. This industry is growing quickly and is often described as the Wild West all over again. The high cost of LEDs allows other features to be explored in these lamps. These lamps are available with circuits that provide Internet access and control (IoT), allowing for remote control of the lamps from Wi-Fi and computer devices.

For the October 2014 IAS conference, there were no papers on traditional lighting. All lighting papers were on LED lighting. The prior art lamp technologies required substantial manpower, plant, and knowledge investments for a business to enter those markets. The effort required to enter the LED market is reduced, and the Internet further eases the entry and dissemination of information. Will the last 100 years of light-source development be made obsolete by the arriving LED technology? What LED lighting standards are needed? New authors and lighting committee members, focused only on LEDs, are appearing, and the ILDC needs to be ready for all the changes that are coming.

### Acknowledgments

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# The Cement Industry Committee



he scope of the Cement Industry Committee (CIC) is the treatment of all matters within the scope of the IEEE

Industry Applications Society (IAS) in which the emphasis or dominant factor specifically relates to the manufacture of cement. The CIC mission statement is as follows:

To promote the development and application of safe, reliable, and effective electrical and electronic systems and equipment for the cement industry by facilitating communications within the industry. This is accomplished by organizing technical meetings, publishing technical papers, and creating voluntary engineering standards and practices.

The IAS CIC has been in existence and serving the technical needs of the cement industry since 1959. In excess of 35,000 attendees have participated in the annual IEEE IAS CIC Conference since its inception.

The IEEE IAS CIC/Portland Cement Association (PCA) Conference is held annually in a location that permits the attendees to tour a facility featuring a recent installation of the latest technology employed in the industry. Attendance over the last 30 years has grown from about 500 to 1,000 attendees. Some of our significant initiatives from the last 30 years include the following.

In 1984, the Gulf Coast Local Organizing Committee was formed. This committee joined the East Coast and West Coast

Digital Object Identifier 10.1109/MIAS.2014.2362024 Date of publication: 10 December 2014 Committees in organizing twoto three-day regional mini conferences servicing management and technical personnel from local manufacturing facilities and engineering offices.

As a result of the recent recession, the East Coast and Gulf Coast Committees have been disbanded; however, the West Coast Committee has remained a strong and effective committee. As the economy continues to improve, the CIC will strive to restore the regional conference program.

- In 1990, a day of tutorials was added to the conference program, and the tutorial program has continued to expand. Training is provided in technical areas aligned with each of the six CIC working groups (Automation, Drives and Related Products; Power Generation; Distribution and Related Products; General Practices; Maintenance and Safety; and Environmental, Energy, and Sustainability). In addition to technical training, industry needs with respect to safety training are addressed by offering Mine Safety Health Administration (MSHA) annual refresher training for experienced miners (as specified under MSHA Part 46). Many companies and consultants serving the cement industry now use this program as part of their MSHA compliance program.
- In 1996, the CIC ushered in the first joint conference with the PCA in Los Angeles. The conference is now jointly

sponsored by the IAS and the Portland Cement Educational Foundation, which highlights the close ties the CIC shares with the industry it serves.

- In 1997, vendor exhibits were added to the annual Cement Industry Conference. Typically, 120–170 vendors and industry consultants participate in the program.
- In 2006, the Cement Industry Meritorious Service Award was initiated, recognizing individuals making significant contributions to the cement industry and IEEE. The award recipients to date include
  - Roderick Simmons
  - Ib Bentzen Bilkvist
  - John Videgar
  - Paul Riley
  - Clayton Reid
  - Edgar Buehler
  - John Sommers.
- In 2008, a student outreach program was initiated to sponsor university engineering students' attendance to the annual Cement Industry Conference. The program currently features a visit to a modern portland cement manufacturing facility and participation in a cement 101 tutorial. The goal of the program is to encourage young engineers to seek careers in process industries, specifically the cement industry.

As the IEEE IAS CIC enters its 57th year, it remains a healthy committee that provides a noncommercial venue for technical information exchange within the cement industry.

**IAS history** | lanny floyd



# The **Electrical Safety** Committee

he Industry Applications Society (IAS) Executive Board formally established the Electrical Safety Committee in May 2012. The appointed officers were Danny Liggett (DuPont), chair; David Pace (Olin Corp.), vice chair; and Stephen Wilson (ArcelorMittal-retired), secretary. The scope of the committee includes all matters within the IAS in which the emphasis or dominant factor specifically relates to occupational hazards of electrical energy. Topics include, but are not limited to, hazard phenomena, inherently safer design, work practices, hazard mitigation, and electrical safety management. The committee has the objectives of 1) advancing the state of the art in methods and technologies that contribute toward the prevention of occupational electrical incidents and injuries and 2) promoting and supporting electrical safety activities in IAS committees, technical activities, and IAS Chapter activities. The officers for 2015 are David Pace, chair; Stephen Wilson, vice chair; Scott Seaver (Killark/Hubbell), secretary; and Daniel Roberts (Schneider), incoming secretary.

The Electrical Safety Committee began in the summer of 1991. Don Vardeman (Oryx Energy) and Lanny Floyd (DuPont) were organizing the first meeting of the Safety Subcommittee of the IAS Petroleum and Chemical Industry Committee (PCIC), to be held in September 1991 at the Royal York Hotel in Toronto, Ontario. In addition to organizing a



The logo for the IAS Electrical Safety Committee and Electrical Safety Workshop.

safety technical session at the annual IAS PCIC Conference, Vardeman and Floyd proposed that the Safety Subcommittee also organize an annual forum separate from the PCIC Conference. The new PCIC Safety Subcommittee endorsed the proposal, and the first PCIC Electrical Safety Workshop (ESW) was held 17-19 February 1991 at the Dallas-Fort Worth Airport Hyatt Regency Hotel. The ESW has been held annually in North America. In 1998, the tagline "Changing the Electrical Safety Culture" appeared for the first time.

In 1999, the name of the annual forum was changed from the PCIC ESW to the IAS ESW, reflecting the demographics of expanding participation. In the mid 1990s, the steering team included Lanny Floyd, David Pace, Danny Liggett, Lynn Roach (Eastman Chemical), Kim Eastwood (Thermon Industries), and Joe Andrews (U.S. Department of Energy, Savanna River).

Following the 1998 ESW in Indianapolis, ESW Chair Shahid Jamil (Exxon Chemical Co.) collaborated with Satish Chaparala to organize an ESW in Madras, India. This set the stage for electrical safety conferences that were held in New Delhi (2000), Bombay (2002), and Hyderabad (2012). In 2003, Luiz Tomiyoshi (DuPont) and Estellito Rangel, Jr. (Petrobras) organized the first ESW in Guararema, Brazil. This became a biannual forum in Brazil held in in São Paulo (2005), Rio de Janiero (2007), Blumenau (2009), São Paulo (2011), and Pernambuco (2013).

From its roots beginning in 1991, the IAS Electrical Safety Committee has built a global collaborative network of thought leaders and practitioners who continue its mission to "change the electrical safety culture." The electrical safety community the committee has nurtured extends beyond the electrical engineering constituency of the IEEE and IAS and includes safety professionals, physicians, educators, attorneys, standards developers, print media, electricians, and government regulators. The collaborative relationships nurtured by the activities of the Electrical Safety Committee have influenced and accelerated advancements in inherently safer equipment designs, hazard analysis methodologies, codes and standards, and other efforts aimed at preventing occupational electrical mishaps, injuries, and fatalities.

For more information, visit the IAS Electrical Safety Committee Web site at http://sites.ieee.org/ias-esafc/.

IAS

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# The Metal Industry Committee

he Metal Industry Committee (MIC) began in 1914 with the American Institute of Electrical Engineers (AIEE) and later became the Mining and Metal Industry Committee in 1948. In 1958, the Mining and Metal Industry Committee was divided into the Metal Industry Committee and the Mining Industry Committee. In 1963, the AIEE and the Institute of Radio Engineers merged to form the IEEE, and in 1972, the committee was reorganized as the MIC of the IEEE Industry Applications Society (IAS). The MIC was tasked with the treatment of all matters within the scope of the IAS in which the emphasis or dominant factor specifically relates to the making, shaping, or treating of metals. At that time, the MIC was heavily supported by engineers from the U.S. metal fabricating industries and the associated equipment fabricators. This included the major aluminum and steel producers along with General Electric, Westinghouse Electric, Reliance Electric, and rolling mill builders.

Looking at the papers presented and the MIC membership from about 1987 forward, there was a shift to academia involvement. In the early 1990s, there was about an equal division between the metal industry, equipment suppliers, and academia. There was also a shift to companies and universities outside of the Unit-

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### IEEE IAS METAL INDUSTRY COMMITTEE CHAIRS AND VICE CHAIRS

Years	Chair	Vice Chair
1994–1995	Paul Castro, Fluor Daniel, South Carolina	Juergen K. Schwahn, Alcan, Ontario
1996–1997	Juergen K. Schwahn, Alcan, Ontario	M.O. (Marv) Camp, Alcoa, Tennessee
1998–1999	M.O. (Marv) Camp, Alcoa, Tennessee	Gerry Niebler, Rockwell Automation, Wisconsin
2000–2002	Bill Pruss, U.S. Steel, Pennsylvania	Dave Yankel, General Electric, Michigan
2002–2003	Lou Dreinhoefer, Alcoa, Tennessee	Bruce Koziol, Defasco, Ontario
2004–2005	Bruce Koziol, Dofasco, Ontario	Tom Dionise, Eaton Cutler Hammer, Pennsylvania
2006–present	Tom Dionise, Eaton Electrical, Pennsylvania	Cheng-Tsung Liu, National Sun Yat-Sen University (Taiwan)

ed States. The 2000 IAS Annual Meeting in Rome provided additional momentum to the shift outside the United States. Since then, the shift has continued to less industry and supplier participation and more participation from academia. Most of the academia participation is from Europe, the Middle East, Asia, and South America, where universities conduct research and development in collaboration with the metal industry and equipment suppliers.

Membership has slowly declined from more than 50 members to about 30 members. Many of the current members are now from outside North America. Lou Dreinhoefer and Juergen Schwahn, past chairs of the committee, are both retired but have continued to perform the paper reviews for the last several years. (See "IEEE IAS Metal Industry Committee Chairs and Vice Chairs" for a list of recent committee chairs.)

The MIC has attracted about ten high-quality papers per year for the last several years. Recent subjects include sensors, controls, and power harmonic studies related to electric arc furnaces, casting systems, steel pickling lines, induction heating, and rolling mills. The majority of these papers are recommended for publication in IEEE Transactions on Industry Applications or IEEE Industry Applications Magazine. Records show that in 1987, the MIC began selecting a Prize Paper (first place) and Meritorious Paper (second place) and has presented these awards annually for the past 26 years.

One of the more recent goals of our committee was to attract a larger audience from other committees in the IAS. In 2002, we participated in a panel discussion session on industrial drives application. The paper from the MIC, "AC Drives in the Metals Industry," by Louis H. Dreinhoefer and F. David Magee of Alcoa Inc. was well received and has since been referenced in several papers.

The MIC went a step further in 2009 and sponsored a focus session at the IAS Annual Meeting in Houston, Texas, on workplace safety and arc-flash hazards. Tom Dionise and Doug Cromey designed the session and invited experts from other IAS committees to contribute their papers. Four papers were obtained and presented in a special four-hour session. The first (by Cromey et al.) was aimed at the process of developing a model for cases where tables did not provide accurate values for the metal industry facilities. The second paper (by Floyd)

was directed toward the better understanding of global standards globally on arc-flash hazards. The third paper (by Valdez et al.) focused on the methods to determine ways and means to mitigate some of the high arc-flash levels to levels more appropriate for day-to-day plant operations. The final paper (by Shipp et al.) was chosen to open up a view into the developing world of new products that would give us additional tools to be considered either in new installations or as retrofits in the existing installations. The session was very successful and was well attended. The four articles were published in the July/August 2011 issue of IEEE Industry Applications Magazine on electrical safety in industry.

In the world of acronyms, MIC was shared with the Mining Industry Committee, at times leading to confusion. In 2009, METC was adopted as the official acronym for the Metal Industry Committee. Although the METC acronym is new, the purpose of the committee remains the same. The METC vision for the future is one of growth, and the committee hopes to develop and sponsor future focus sessions on other subjects of common interest to the IAS. The METC is hopeful that focus sessions will bring more engineers from industries to become part of the committee as many companies have cut back on engineers attending conferences.

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IAS




**IAS history** joseph sottile, thomas novak, & galina mirzaeva

## The Mining Industry Committee

he purpose of the Mining Industry Committee (MIC) of the IEEE Industry Applications Society (IAS) is to enhance mine safety and productivity

through the application of the principles of electrical engineering. To achieve this goal, the MIC provides a means of communication for the electrical engineer with his/her peers in the mining industry to provide an atmosphere for all members to increase their technical skills and to keep abreast of advancements in this, and associated, fields. The presentation of papers gives members opportunities to demonstrate their knowledge and help others through the exchange of this knowledge. This relatively small committee currently sponsors two or three technical sessions at the IAS Annual Meeting.

The precursor of the present-day IAS MIC began before 1920 as the American Institute of Electrical Engineers (AIEE) Mines Committee. In 1948, the Mining and Metal Industry Committee was formed and became part of the AIEE Industry Group. In 1958, the Mining and Metal Industry Committee was separated into two distinct technical committees: the Metal Industry Committee and the MIC. The MIC became a technical committee in the IEEE Industry and General Applications (I&GA) Society when it was created in 1965. In 1971, the I&GA Group changed its name to the IAS, where the MIC currently resides.

Electrical installations in mining have numerous special features and demands, e.g., power system portability, dynamic loading, and the remote location of loads. In addition, by the nature of the mining process, the electrical power system, particularly the utilization portion, is moved frequently rather than being static as in most industrial installations. These differences from other industries cause unique electrical system problems, prompting special requirements. Consequently, much of the early work in the MIC produced documentation on terminology, recommended practices, and safety rules, some of which were published as standards. These were used for several years without modification; however, substantial and rapid changes in technology and new federal regulations soon made this early work obsolete.

Committee interest in standards activities was renewed after the formation of federal mine safety and health laws in the late 1960s. In 1976, a cooperative understanding was initiated between the IEEE and the federal mining regulatory agency, now the Department of Labor's Mine Safety and Health Administration. In response to this concern, the IAS formed the Mining Safety Standards Committee within the Standards Department. Its membership was appointed to form a consensus to guide and expedite all mining standard activities in IEEE. They were also given permission by the IEEE Standards Board to review federal mine electrical regulations.

The passage of the Coal Mine Health and Safety Act of 1969 combined with the energy crisis of the mid-1970s created many challenges

and opportunities for electrical engineers working in the mining industry. At West Virginia University (WVU), researchers recognized that there was a need for a forum for electrical engineers working in the mining industry to interact and present their research. Consequently, in 1972, the first WVU Conference on Coal Mine Electrotechnology was organized. This conference was conducted every two years until 1994. The IAS MIC was similarly active in the area of technical information dissemination and sponsored its own mining industry technical conferences in alternate years with the WVU conference. These conferences, along with the IAS Annual Meeting, presented venues for publishing research results that addressed the pressing electrical safety issues at that time, such as mine power system analysis and protection, system grounding, groundwire monitoring, system modeling and reliability, in-mine communications, environmental monitoring, mine illumination, and methods for locating trapped miners.

By the late 1980s, the power requirements for longwall equipment used in underground coal mining had reached a point where the practice of using a 995-V utilization voltage, which was the maximum voltage allowed by federal regulations, was no longer adequate. Significant research and development activities were directed toward the use of 2.40 kV, and 4.16 kV shortly thereafter, for operating longwall equipment at the mining face. Problems with groundfault-relay sensitivity and selectivity, associated with using high-resistance

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grounding at these higher voltages, were also studied. At that time, the automation of longwall equipment and surface-mine haulage trucks became topics of increased interest, which continues today.

More recently, the U.S. Congress enacted the Mine Improvement and New Emergency Response Act of 2006, commonly known as the Mine Improvement and New Emergency Response Act. The act was created in response to a cluster of mine disasters that occurred in early 2006 and identified the need for wireless postaccident communications and electronic tracking systems. As a result, the U.S. government and the private sector established comprehensive research programs to develop new, and enhance existing, communications technologies for postaccident applications in underground coal mines. The resulting communications systems fall into two general categories-primary and secondary communications. Primary communications include leaky-feeder and node-based mesh systems, while medium-frequency and through-the-earth communications are considered to be secondary (backup) systems. Other recent research includes the application of light-emitting diode lighting, quantifying arc-flash hazards.

The MIC also continues to showcase international applications focused on the improvement of various aspects of mining operations in Australia, Chile, Brazil, and other countries. One important direction in Australian mining research is improving the reliability of production-critical mining machines by predictive condition monitoring. Electric motors used in digging machines operate under high and dynamically changing loads, and the change in their condition can be related to their duty. The concept of an electric motor duty meter, developed by the University of Newcastle, Australia, has been presented at a number of IAS conference sessions, including plenary sessions. Duty meter models are being tested on fullsize industrial motors on a dynamic dynamometer under simulated digging conditions (Figure 1).

Another important research topic is the improvement of power quality and power efficiency, particularly in remote



Hoist motors on a dynamometer test bed.



A prototype statcom for power quality improvement in mining.

mines with weak supplies. A 19-level 415-V prototype statcom (Figure 2) has been constructed at the University of Newcastle for the experiment verification of various power conditioning strategies. The most recent projects highlighted at IAS mining sessions include distributed power generation for remote mines and highly efficient dc microgrids for open-cut mining.

In Chile, applications have been presented on improvements in copper-winning intercell bars as well as large-scale machines and drives used in the copper industry. Results related to the use of fault-resilient drives on long-distance conveyors have been reported from researchers in Brazil.

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IAS history | rick bried

THE TECHNICAL

PROGRAM, THE

HEART OF THE

PCIC

CONFERENCE,

HAS GROWN

FROM 19 PAPERS

PRESENTED IN

1954 TO 54

PAPERS TODAY.

# The Petroleum and Chemical Industry Committee

he Petroleum and Chemical Industry Committee (PCIC) is responsible for all matters within the scope of the IEEE Industry Applications Society (IAS) that directly relate to the production, manufacturing, and

transportation of petroleum and chemical products. The committee began as the Petroleum Industry Subcommittee, which met with the Chemical Industry Committee of the American Institute of **Electrical Engineers** (AIEE), held in conjunction with the AIEE winter meetings in New York. The last meeting of the Petroleum Industry Subcommittee and the Chemical Industry Committee was the 1952 New York Winter Meeting.

The Petroleum Industry Committee (PIC) was formed in 1953 and held its first Petroleum Industry Conference at the Mayo Hotel in Tulsa, Oklahoma, on 27 September 1954. It was sponsored by what was then the Petroleum Committee of the AIEE. Tulsa was selected as the location for this first conference

Digital Object Identifier 10.1109/MIAS.2014.2362028 Date of publication: 10 December 2014 because it was considered to be the focal area for the petroleum industry.

Rather than foster competition and possible conflict, the PIC and the American Petroleum Institute (API) Subcommittee on Electrical Equipment agreed in the 1960s to meet together, a practice that continues to

this day. The API meetings, initially one day in length but currently three days, are held in conjunction with the PCIC meeting. The result has been that the active API members have also become active members and officers of the PCIC and the IEEE.

On 1 January 1963, the Institute of Radio Engineers officially merged with the AIEE to form the IEEE. Under the new IEEE, there was an Industry Division,

which later became known as the Industry and General Applications (I&GA) Group. In 1972, the I&GA Group changed its name and structure to the IAS without any change to its purpose or function. At its formation, the PIC had pulled away from the Chemical Industry Committee due to divergent interests of the conference attendees. However, by 1968, a similarity had again developed, and the term *petrochemical* had become commonplace. There was a common bond of interest between the petroleum electrical engineer and the chemical electrical engineer. Thus, these two groups rejoined in 1968 and formed the PCIC.

The first three conferences were held in the central United States (Tulsa, Oklahoma, in 1954, Houston, Texas, in 1955, and Kansas City, Missouri, in 1956). The 1957 conference was held in Philadelphia, Pennsylvania, and, on the basis of the outstanding success of this meeting, it was determined to hold the conference in various sections of the country where there are major petroleum and chemical facilities. Therefore, the conference rotated between central, eastern, and western U.S. locations. In 1987, the first conference outside the United States was held in Calgary, Alberta, Canada. Other Canadian cities that have since been included in the location rotation are Vancouver and Toronto.

The technical program, the heart of the PCIC Conference, has grown from 19 papers presented in 1954 to 54 papers today presented in sessions sponsored by the Chemical, Electrochemical, General Program, International, Marine Industry, Production, Refining, Safety, and Transportation Subcommittees. In addition to these technical subcommittees, there are administrative subcommittees that are integral to the PCIC's success: Advisory and Awards, Awards Nominating, Codes and Regulations, Emeritus, Facilities Planning, Financial, Historical, Information Technology, Membership, Papers Review, Publications,

Publicity, Standards, Tutorials, and Young Engineers Development.

The activities of the Safety Subcommittee, which was chartered in 1991, included sponsoring the Electrical Safety Workshop and encouraging and supporting Electrical Safety Workshops hosted outside the United States. In 2012, the IAS Electrical Safety Committee was established and is now responsible for the Electrical Safety Workshops. PCIC-sponsored standards have grown over the years; there are now 45 PCIC standards working groups.

By the early 2000s, a number of European electrical engineers had been attending PCIC conferences in North America and had a vision to have a similar gathering of electrical engineers in Europe. A memorandum of understanding was developed in which the IAS PCIC would assist in the development of the technical program, authorize the use of the IEEE and IAS logos, provide publicity in *IEEE Industry Applications Magazine*, and allow access to the copyright of the proceedings. PCIC Europe held its first conference in 2004.

The key to the success of these conferences has been the local committee chair and his or her local committee members, who provide the conference planning, facilities, and execution. The guiding parameters in selecting a site for the annual meeting are as follows:

- A local-area IEEE Chapter must be willing and able to support the conference.
- A local conference chair and committee must be willing to serve and have the wholehearted support of their companies to accept such responsibilities.

- The local conference chair must be a PCIC member and become a member of the executive subcommittee when appointed local conference chair.
- There must be adequate hotel facilities and staff experienced in handling conferences.

PCIC conferences have been successful both technically and financially. The conference's technical success is a result of the rigorous review process of the papers submitted. Many papers go on to be published in *IEEE Transactions on Industry Applications* or *IEEE Industry Applications Magazine*. The conference's financial success is a result of the volunteer efforts of the local committee chair and his or her committee. Conference attendance ranges from 1,200 to 1,600 attendees and 300 to 500 guests.

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## The **Pulp** and **Paper Industry** Committee

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SURVIVED MANY

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**PPIC HAS** 

ADAPTED AND

RECONFIGURED

**ITS PROGRAMS** 

AND STRUCTURE.

he IEEE Industry Applications Society (IAS) Pulp and Paper Industry Committee (PPIC) had its simple beginning in 1955 as a subcommittee of the General Industry Applications Group of the American Institute of Electrical Engineers (AIEE). The

PPIC was formed in 1955 with a total original membership of 22 members.

This subcommittee held its first Annual Pulp and Paper Conference in Gainesville, Florida, 8-9 March 1956, in conjunction with the local AIEE and the University of Florida. The major thrust of the committee's activities has always been to present technical papers on topics directly related to electrical engineering activities, as practiced in the pulp and paper industry.

This first conference was very successful in all respects. The total registration was 92, which included some 30–35 mill peo-

ple. The group was small but very close, friendly, and enthusiastic. This

Digital Object Identifier 10.1109/MIAS.2014.2362030 Date of publication: 10 December 2014 tradition still lives on in the conferences today. Perhaps it was the conference fee that attracted the stout crowd; the full fee for conference registration was only US\$2.50.

The format of the presentations was similar in style to that used at most conferences today—technical oration of the written work followed

> by active questionand-answer sessions. These were so active, in fact, that it was said that the question-andanswer session had to be stopped for practically every paper because of a lack of time in the schedule.

> At the conclusion of the first conference, a committee meeting was held to determine the location for the next conference: the next conference would be held in March 1957 in cooperation with Georgia Tech, Atlanta. Until 1961, the annual conferences were held in college and university locations. The longeststanding committee member, Claude H. Hudson, began his

involvement with the committee as the second vice chair beginning in 1957. Claude attended almost every annual conference until his passing in August 2010. In 1959, the first spouse's program was incorporated into the conference and still remains a very popular addition. Starting in 1962, the committee instituted the new product presentations (NPPs) that were opportunities for vendors to highlight their new products and technologies through a brief technical presentation. Today, the NPPs still continue to serve the annual conference attendees.

In 1968, the committee instituted the Meritorious Achievement Award to annually honor an individual who, through outstanding performance related to his or her career, has made substantial contributions that serve to further the objectives of the PPIC. In 1986, the Meritorious Service and Engineering Award was added. In recognition of James A. Rooks' lifelong contribution to the pulp and paper industry, the committee established the James A. Rooks Memorial Student Intern Program. Every year since 2007, the committee celebrates Jim's relentless compassion to bring young engineers into the industry by sponsoring engineering student interns working for industry manufacturing companies to attend the annual technical conference at no cost.

From 1955 to 1970, the committee operated without major technical subcommittees. In 1971, the committee was reorganized into four major technical subcommittees: Engineering Management; Maintenance and Construction; Power (Power Distribution), Drives, and Control Systems; and Training, Safety, Standards, and Codes. These subcommittees, as well as the new ad hoc special focus subcommittees, have continued the trend and policies of presenting topics of major technical importance to conference attendees.

In 2005, the executive committee chair introduced a new ad hoc subcommittee to focus committee attention on other new forest-productbased segments. This is because the traditional pulp and paper processors had redeveloped their focus to include diverse new wood-product-based technologies, including new highly automated facilities to utilize wood materials in a gamut of new ways. This ad hoc committee, named the Forest Products Subcommittee, continues to help attract other forest-product-based industries to the benefits of being a part of the PPIC.

The continued excellence of the PPIC's technical programs, special events, and participants is evidenced by the continued support of its THE PPIC WAS FORMED IN 1955 WITH A TOTAL ORIGINAL MEMBERSHIP OF 22 MEMBERS. conference. As forestproduct-based industries have survived many economic and technical changes, the PPIC has adapted and reconfigured its programs and structure, striving to support the legacy of providing a world-class forum for progress in the electrical and control side of this industry segment.

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# The Industrial and Commercial Power Systems Department



s we approach the 50th anniversary of the IEEE Industrial and Commercial Power Systems (I&CPS)

Department this year, I was asked, as a past chair of the department, to provide an article reflecting the history and impact of the department on the

IEEE Industry Applications Society (IAS) and the IEEE membership in general. Fifty years is a long time, and while I have been an IEEE member for over 36 years, I was not in the original group that formed the first I&CPS Department. It was initially called the I&CPS Committee under the newly formed Technology Committees Section of the IEEE Industry and General Applications (I&GA) Group within the IEEE. The IEEE had been formed in 1963, the

THE I&CPS DEPARTMENT HAS PLAYED A MAJOR ROLE IN THE DEVELOPMENT OF ONE OF THE MOST POPULAR SERIES OF

STANDARDS.

previous year, by a merger of the American Institute of Electrical Engineers (AIEE) and the Institute of Radio Engineers (IRE) [1].

The actual designation as a department was not officially brought about

Digital Object Identifier 10.1109/MIAS.2014.2362031 Date of publication: 10 December 2014 until 1977, when the entire IAS was reorganized into more logical groupings. Prior to this time, it was the I&CPS Committee, with its roots in the AIEE, when the Industrial Power Systems (IPS) Committee and the Commercial Buildings Electric Systems (CBES) Committee merged into one committee. Prior to that merger,

> the AIEE publication Electric Power Distribution of Industrial Plants was published in 1945; it was commonly referred to as the Red Book due to its bright red cover and was a product of the IPS Committee. In 1949, the CBES Committee developed another publication, Interior Wiring Design for Commercial Buildings, the forerunner of the Gray Book. In 1956, the second edition of the Red Book was published, and a new publication was developed by the IPS Industrial Grounding

Subcommittee, *Grounding of Electrical Power Systems*, which had a green cover and so naturally became known as the *Green Book*, and the birth of the *Color Book* series was a reality [3].

As Bill Moylan remembers, "My first real involvement in IEEE activities began the day I sat in on a *Red Book* Working Group meeting and volunteered to act as the group's secretary. Years of effort in that position introduced me to the many giants of engineering that contributed to that standard. In time, I chaired that working group and the I&CPS Department. Involvement in the Department's standards efforts allowed my consulting firm to remain at the cutting edge of electrical design."

The evolution of the I&CPS mirrors the IAS's evolution, but in 1965, after the IEEE was formed by the AIEE and IRE merger, the I&CPS Committee was one of 23 technical committees within the Technical Operations Department (TOD) of the I&GA [10]. In 1972, the I&GA became the IAS, and the committee structure under the TOD was rearranged into two groups: industry committees and technology committees. The I&CPS was placed in the technology committees group along with eight other committees. In 1974, the department/committee structure was once again modified to create an Industry Operations Department and a Technology Operations Department in lieu of the TOD with the same committee alignment as before [11].

In 1977, the IAS was once again reorganized with respect to operating departments to form five departments, including the new IPS Department, Process Industries Department, General Industries Department, Industrial Power Conversion Systems Department, and

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Industrial Utilization Systems Department. The committees placed in the IPS were both technical and administrative. Administrative committees included Administration, Codes and Standards, and Meetings. The technical committees within the IPS were Commercial Buildings Power Systems, Electric Space Heating and Air Conditioning, Industrial Plants Power Systems, Power Systems Protection (PSP), and Power Systems Support [6]. By 1984, the committee structure was once again rearranged to include the I&CPS as a department with seven committees, including Operating, Codes and Standards, Commercial Buildings Power Systems, Electric Space Heating and Air Conditioning, Industrial Plants Power Systems, PSP, and Power Systems Technologies [1].

As Lanny Floyd, past chair of the I&CPS Power Systems Engineering Committee, remembers: "In 1984, with encouragement from an excellent mentor, I attended the I&CPS Technical Conference. There, I connected with the Maintenance, Operations, and Safety Subcommittee. A number of people I met at my first IEEE conference became lifelong friends and professional colleagues. As a young engineer, those experiences in the technical activities of the I&CPS Department opened the door to professional development and opportunities that shaped my career. I will always be grateful to my I&CPS colleaguespast and present."

By 1985, the old I&CPS committee structure had been modified several times and four technical committees resulted: Codes and Standards, Energy Systems, Power Systems Engineering (formerly the Power Systems Support Committee and the Power Systems Technologies Committee), and PSP. The Rural Electric Power Committee was moved into the department in 1992, and the now five technical committees rounded out the department's structure, which remains in effect today [11].

After the 1963 merger of AIEE and IRE into the IEEE, the first standards under the oversight of the I&CPS included a rewrite of the AIEE publication *Interior Wiring Design for Commercial Buildings* and its publication as IEEE Standard 241, Recommended Practice for Electric Power Systems in Commercial Buildings (nicknamed the Gray Book). Similarly, the Red Book (AIEE 952) and Green Book (AIEE 953) eventually became IEEE Standard 141, Recommended Practice for Electric Power Distribution for Industrial Plants and IEEE Standard 142, Recommended Practice for Grounding I&CPS, respectively [5].

A little bit earlier, and somewhat parallel to the activities of the aforementioned committees, the groundwork was laid for the creation of a PSP Subcommittee within the I&CPS. This was influenced by the AIEE Power Division Relays Committee (I&CPS was in the industry division) to create a subcommittee to avoid an infringement of scope for industrial relay protection schemes. In 1961, the System Coordination and Protection Subcommittee was formed within the I&CPS for the purpose of recommending preferred application

practices of protective equipment used within industrial plants and commercial buildings. In 1965, the subcommittee presented a report to the I&CPS Conference in Buffalo, New York, "Protection and Coordination of I&CPS," and it was welcomed by the I&CPS membership. It only took ten years to become IEEE Standard 242, Recommended Practice for Protection and Coordination of I&CPS, otherwise known as the Buff Book [4].

IEEE formed the first Standards Board (SB) in 1963 shortly after the merger. In 1998, the IEEE SB was reorganized as the IEEE Standards Association (IEEE-SA), which gave it more autonomy as a standards-making body. The IEEE-SA today is still committed to providing the most current, reliable standards knowledge to the electrical engineering community. The I&CPS Department has played a major role in the development of one of the most popular series of standards—the *Color Books*—as mentioned previously. A bit of history and responsibility of the development of these standards follows.

Baldwin "Baldy" Bridger, Jr., a long-time participant and leader in the I&CPS, commented on the *Color Books.* "My dealings with the *Color Books* go back to when they were

THE I&CPS IS CURRENTLY WORKING ON A SIGNIFICANT UNDERTAKING TO REORGANIZE THE COLOR BOOK CONTENT INTO MANY INDIVIDUAL STANDARDS.

really bound books. I personally worked on at least three revisions of the Green Book. Recommended Practice for Grounding of I&CPS. This effort extended from some time in the late 1960s into the 1990s. The IEEE SB wanted each standard to be either reaffirmed or revised once every five years. I do not think we ever met that time frame. It took us more like ten years to complete a revision, which sometimes meant that work done early in the process had to be redone at the end because things had changed during the time frame. We usually took a year off

between revisions, but otherwise it was an ongoing, if somewhat sporadic, process."

In addition to the four *Color Books* mentioned previously, several more were developed and entered into the standards process by committees under the jurisdiction of the I&CPS Department [9]. The Power Systems Engineering Committee, through several subcommittees and working groups, in addition to the *Red, Gray,* and *Green Books* [8], developed the following:

- IEEE Standard 399-1980, IEEE Recommended Practice for I&CPS Analysis (the Brown Book)
- IEEE Standard 446-1980, IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications (the Orange Book)

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- IEEE Standard 493-1980, IEEE Recommended Practice for the Design of Reliable I&CPS (the Gold Book)
- IEEE Standard 551-2006, Recommended Practice for Calculating AC Short-Circuit Currents in I&CPS (the Violet Book)
- IEEE Standard 602-1986, IEEE Recommended Practice for Electric Systems in Health Care Facilities (the White Book)
- IEEE Standard 902-1998, IEEE Guide for Maintenance, Operation, and Safety of I&CPS (the Yellow Book)
- IEEE Standard 1100-1992, IEEE Recommended Practice for Powering
   made Community

and Grounding Sensitive Electronic Equipment (the Emerald Book).

In the words of Erling Hesla about one of the more recent Color Books, "My goodness! The Yellow Book was published 25 years ago today. Have the Yellow Book and I really been around that long?" The Energy Systems Committee (formerly known as the Energy Committee) developed IEEE Standard 739-1984, IEEE Recommended Practice for Energy Management in IndusANOTHER 50 YEARS OF ELECTRICAL ENGINEERING STANDARDS DEVELOPMENT BY PARTICIPATING IN THE PROCESS.

HELP US BEGIN

trial and Commercial Facilities (the Bronze Book).

The PSP Committee, through its subcommittees and working groups, in addition to the *Buff Book*, developed IEEE Standard 1015-1997, *IEEE Rec*ommended Practice for Applying Low-Voltage Circuit Breakers Used in I&CPS (the Blue Book).

By the year 2000, there were 12 *Color Books* published and in use, and six years later, the last of the *Color Books* to be introduced—the *Violet Book*—was published. I say the last because the I&CPS is currently working on a significant undertaking to reorganize the *Color Book* content into many individual standards, which will provide more flexibility and usability for both developers and users of the technical content. The Technical Books Coordinating Committee (TBCC) is currently responsible, through several editorial working groups, for this reorganization and rebranding of the popular standards collection into the 3000 series of standards.

Lynn Saunders sums up his recollection of his standards experience: "What a fantastic group of dedicated and knowledgeable professionals. The discussions were lively and often animated but always respectful. The opportunities were there to get involved and participate in a

process that we all can be very proud of. My hope is that those that follow can continue to benefit from the efforts that preceded [them]."

While the Rural Electric Power Committee (REPC) does not produce any IEEE standards, it is still a very important committee within the I&CPS. The REPC Conference provides a forum for those engineers and practitioners involved in the farming communities to exchange ideas and techniques to make rural electrification

efforts better for all. John Zelenak, in his paper, "History of the Rural Electric Power Committee," states "Early programs were consumer oriented and directed toward power requirements and applications of equipment and trends in agriculture as it affect electrification. The speakers and participants were encouraging greater use of electrical energy on the farm, safer use of electrical equipment, and helping the farmer to increase the productivity with decreasing human effort" [2].

The REPC has had three different names since the first meeting was held in 1955. (It is the same age as I am.) The meetings began as part of the AIEE as the AIEE Conference on Farm Electrification and then under the IEEE as the IEEE Rural Electrification Conference. In 1970, the committee name was changed to the IEEE REPC [7]. At that time, the committee was one of the industry committees within the I&GA Group, while the I&CPS was called the I&CPS Committee in the technology committees section of the I&GA Group. In 1992, the REPC became a committee within the I&CPS Department.

Help us begin another 50 years of electrical engineering standards development by participating in the process.

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IAS history | po-tai cheng and avoki m. omekanda

## The Industrial Power Conversion Systems Department

he Industrial Power Conversion Systems Department (IPCSD) is one of the four departments of the IEEE Industry Applications Society (IAS). Today the IPCSD comprises six technical committees:

- Electric Machines Committee (EMC)
- Industrial Drives Committee (IDC)
- Industrial Power Converters Committee (IPCC)
- Power Electronic Devices and Component Committee (PEDCC)
- Transportation Systems Committee (TSC)
- Renewable and Sustainable Energy Conversion Systems Committee (RSESC).

During the 30th anniversary of the IAS, in 1995, a 100-kW motor drive inverter and various inverter-driven synchronous machine designs were featured as major technical achievements and developments of that time. Since then, the IPCSD has been deeply involved in a rapid evolution of power conversion technologies.

Figure 1 shows a 5.5-kW inverter drive in 1995 and a 30-kW inverter drive in 2014. Their size and weight are nearly the same, but the improvement in the power density is significant. One critical factor is the development of insulated-gate bipolar transistors (IGBTs). The early research

Digital Object Identifier 10.1109/MIAS.2014.2362032 Date of publication: 10 December 2014 on this device [1], [2] paved the way for the first commercial nonlatch-up IGBTs by Toshiba. Since then, IGBTs have played a critical role in the advancement of power conversion technologies.

The following paragraphs briefly discuss the history and accomplishments of each of the six IPCSD technical committees.

#### Power Electronic Devices and Component Committee

The PEDCC has been in the forefront of testing and modeling power semiconductors for their practical applications in the design of power electronics systems [3], [4]. Since the late 1990s, the testing and evaluation of silicon carbide devices have made tremendous progress: first, with Schottky diodes, second, with junc-

tion field-effect transistors, and third, with metal-oxide-semiconductor field-effect transistors (MOSFETs) [5], [6]. In recent years, gallium nitride (GaN) devices have been emerging, and more progress is still expected on their development and deployment. GaN devices have special properties for applications in high-power and high-frequency devices. Over the last two decades, the road map of power electronic switches has been strengthened by a constant improvement of their efficiencies. They became more modular and capable of operating at higher voltages and currents. Noticeable progress has also been achieved in the area of passive components such as super capacitors. Their operation has greatly improved in higher-temperature and harsh environments.

(a) A Yaskawa G3 VFD, 1995 (200 V ac, 5.5 kW, 14  $\times$  8  $\times$  10 in, 22 lbs.). (b) A Yaskawa A1000 VFD, 2014 (200 V ac, 30 kW, 15.5  $\times$  8.5  $\times$  7.5 in, 22 lbs.).





#### **Electric Machines Committee**

The EMC can trace its origin to the Single-Phase and Fractional-Horsepower Machines Subcommittee of the American Institute of Electrical Engineers (AIEE), one of the two engineering organizations that merged in 1963 to form the IEEE. In 1947, the AIEE undertook a comprehensive reorganization of its committees and subcommittees. One of the technical committees that existed in 1947, the Electric Machinery Committee [7], became the Rotating Machinery Committee in January

1948. The 1948 Rotating Machinery Committee had several new subcommittees, including one called the Single-Phase and Fractional-Horsepower Machines Subcommittee, with a roster of eight members [8]. When the AIEE merged into the IEEE in 1963, the Rotating Machinery Committee and its subcommittees became part of the newly formed Power Group, which was later renamed the IEEE Power Engineering Society (PES, now the Power & Energy Society). In 1984, the subcommittee was granted a request to move from

THE IDC HAS ALSO BEEN INVOLVED IN CONTROLS, NOVEL POWER CONVERTER TOPOLOGIES, AND THE USE OF NEW POWER ELECTRONICS DEVICES.

the PES to the IAS [9] and became a subcommittee of the IAS Industrial Drives Committee [10]. In 1986, the subcommittee was renamed EMC when it became one of the technical committees in the IAS IPCSD.

Very few of the records of the period between 1948 and 1984 list the organizational charts of the subcommittees, but the records that do exist show that the Single-Phase and Fractional-Horsepower Machinery Subcommittee was active throughout that period. While the AIEE 1948– 1949 directory shows only eight subcommittee members, the 1950–1951 directory shows 14 members and the 1954–1955 directory shows 17 members. The 1966 and 1970 Power Group directories show 17 and 25 members, respectively.

But by the late 1970s, the subcommittee was struggling. The group continued to sponsor papers at the Winter Power Meeting, but, as a subcommittee member once described the situation, they felt like they were meeting in a closet and only talking to the other authors in the session. Several of the members of the subcommittee were familiar with the IAS Annual Meeting and decided that the IAS might be a better venue for them [9]. After two years of negotiations,

> the subcommittee received approval from PES and IAS to become a subcommittee of the IAS Industrial Drives Committee. In 1984, the subcommittee sponsored two technical sessions at the IAS Annual Meeting with a total of eight papers [11]. While that was a slightly higher number than in previous years, what was most encouraging was the size of the audience, the "land of plenty" as John Oldenkamp, a subcommittee member and former chair, expressed it.

The subcommittee was upgraded to a full IAS technical committee in 1986 with a

new name, the IAS EMC. Growth continued and, by 1987, the committee had 60 members and sponsored 20 papers in three sessions at the IAS Annual Meeting. In the 1990s, the committee reached something resembling a steady state. During that period, the committee had approximately 130 members and organized technical sessions with 50–55 total papers in eight sessions during each IAS Annual Meeting.

The situation changed in the 2000s when various international and non-IEEE conferences began to ask the IAS to review some of their papers for publication in *IEEE Transactions on Industry Applications*. Much of this activity was in the

technical areas of the EMC. Growth resumed as the committee reviewed more papers from conferences other than the IAS Annual Meeting and the Energy Conversion Conference and Exposition (ECCE). Of particular importance here are the International Conference on Electrical Machines and Systems (ICEMSs) in Asia and the International Conference on Electrical Machines (ICEMs) mostly in Europe, which parallel the ECCE in North America especially in the field of interest of electrical machines. By 2010, the committee was reviewing more papers from cosponsored conferences than from the technical sessions it organized itself. In 2013, the most recent complete year available at the time of writing, the EMC had more than 350 members and had completed reviews of more than 250 papers.

The history of the EMC is one of impressive growth and dynamism. The people who transferred the Single-Phase and Fractional-Horsepower Subcommittee to the IAS in 1984 succeeded not only in reviving the group but also in starting a process that transformed a small subcommittee into one of the largest and most active committees within the IAS.

#### **Industrial Drives Committee**

The IDC has mainly been involved in the area of industrial drive applications, which addresses their performance in terms of efficiency, reliability, power density, system compatibility, and cost. The IDC has also been involved in controls, novel power converter topologies, and the use of new power electronics devices. On the controls side, the committee has been interested in the development of efficient, high-bandwidth, and robust control methods.

#### Industrial Power Converters Committee

The IPCC can trace its origin to the subcommittee on mercury-arc rectifiers under the auspices of the AIEE Committee on Electrical Machinery [12]. The subcommittee transferred to the Committee on Electronics in 1940 before becoming the Committee on Electronic Power Converters

in 1947. It went through the following reorganization and name changes:

- Committee on Industrial Power Rectifiers in 1955
- Static Power Converter Committee in 1968
- IPCC in 1989.

Such changes are closely related to the evolution of power conversion technologies. The transition from mercury tubes to semiconductors occurred in the late 1950s and early 1960s. The thyristor-based conversion technologies started their expansion in two waves: first, the naturally commutated converters in the mid-1960s and then the self-commutated converters in the 1970s. As gate turn-off thyristors continued to displace conventional thyristors with commutation circuits in high-power applications, the bipolar junction transistor (BJT)-based converters quickly emerged into the industrial level in the 1980s. MOSFETs of increasing capacity became available. IGBTs, a combination of the bipolar and unipolar transistor technologies, emerged in the mid and late 1980s and quickly became a critical driving force in the power conversion technologies. Continuing the tradition of its predecessors, the IPCC has been greatly involved in this latest wave of evolution. IGBTs enable pulsewidth modulation (PWM) operation [13], [14] for high-bandwidth and highpower industrial applications compared with the earlier BJT- and thyristor-based converters. The space vector PWM techniques and their variations [15]-[17] are adopted to utilize newly acquired advantages. Fundamental current control techniques based on PWM operations are also developed [18]-[23].

The multilevel circuit topologies further extend the application range into the medium-voltage level. The neutral-point-clamped circuit [24] has been widely adopted for wind and solar power systems, high-power motor drives, uninterruptible power supplies (UPSs), and other industrial applications. The modular multilevel converters [25], [26], suitable for an even higher voltage range, also gained significant momentum in the industrial and utility applications.

The industrial applications of the PWM converters technologies quick-

ly gained momentum. Variablespeed drives became ubiquitous. Multilevel converter technologies allowed its expansion into the megawatt range [27]. UPSs were adopted to deliver high quality and high reliability of electric power to critical loads [28]–[30]. Power quality applications, such as harmonic active power filters [31]–[34], voltage sag compensators [35], and reactive power, saw rapid growth.

In the utility level, the renewable energy systems have grown significantly, from a few gigawatts of installed capacity to +100 GW for photovoltaic (PV) and +300 GW in wind with about 50 GW predicted both for wind and PV estimated in 2014. The dramatic power scaling seen in wind turbines and the mass volume production of PV has decreased the cost of energy. The power converters have seen constant cost

reductions as well as improved reliability [36]. The integration of renewables also leads to a major evolution of the grid codes. In the beginning, renewable was an energy source, but now it is an active power source that is also reactive during grid faults. As more renewables, alternative resources, and storage methods are being adopted, our utility is gradually moving toward the smart grid future. These demands will

pose great challenges and opportunities for the power converter topology and control, and the IPCC will continue to strive for new innovations.

#### Transportation Systems Committee

The TSC was established by the IAS Board at the Annual Meeting in October 2011, based on a motion by Giovanna Oriti, the IPCSD chair [37]. The TSC is responsible for all matters within the scope of the IAS in which the emphasis or dominant factor specifically relates to the electrification of the transportation industry, including components, systems, and infrastructure, and encompassing all modes of transportation for people and goods, including automotive, off road, ship, trains, and aircraft.

The founding officers were Iqbal Husain (chair, NCSU, United States), Ayman El-Refaie (vice chair, conferences, GE, United States), Burak Ozpineci (vice chair, papers, ORNL, United States), and Mohammad Islam (secretary, Nexteer, United States). A steering committee was also put together to help the fledging committee fully develop (Bruno Lequesne, Eaton, United States; Giovanna Oriti, Naval Postgraduate School, United States; Tomy Sebastian, Nexteer, United States; Avoki Omekanda, General Motors, United States: Uday Deshpande, General Dynam-

ics, United States).

The committee activities are deeply rooted in the article of the other four committees of the IPCSD, particularly at the IAS Annual Meeting and the ECCE. For years, these conferences regularly held sessions and tracks on the subject. The transportation industry has often been represented on the IAS Board at the highest level. More recently, however, with renewed interest in

hybrid systems, electric vehicles, and transportation electrification in general, and the start of new conferences and pan-IEEE activities on the subject, it was clear that the community needed a home of its own.

Aside from its continuing activities at the ECCE, the TSC is actively involved with the IEEE Transportation Electrification Conference (ITEC), which started in North America in 2012 (under the leadership of Ali Emadi, McMaster University, Canada) and in Asia in Beijing, China in 2014 (led by Longya Xu, Ohio State University). Plans are also under

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HAVE SPECIAL PROPERTIES FOR APPLICATIONS IN HIGH-POWER AND HIGH-FREQUENCY DEVICES.

**GAN DEVICES** 

way for India at a later date, in cooperation with the SAE India. Other symposia and conferences are also sponsored or technically cosponsored, such as the International Electric Vehicle Conference (IEVC), the Electric Ship Technologies Symposium (ESTC), and the Ecological Vehicles Renewable Energies Conference (EVER). ITEC 2014 in Dearborn, Michigan, saw the presentation of the first IEEE Transportation Technologies Awards to IAS Past President Linos Jacovides (1990).

Aside from its traditional involvement with both IEEE Transactions on Industry Applications and IEEE Industry Applications Magazine, the committee is actively supporting IEEE Transactions on Transportation Electrification,

A MAIN

**OBJECTIVE OF** 

THE RESESC IS TO

**INCREASE THE** 

MEMBERSHIP BY

ENGAGING

**PROFESSIONALS** 

IN THE FIELD OF

RENEWABLE

AND

**SUSTAINABLE** 

**ENERGY IN ITS** 

ACTIVITIES.

slated to start in 2015, and *IEEE Electrification Magazine*.

In 2011, the IEEE launched an initiative aimed at developing a home for all matters related to the subject within the IEEE. The initiative developed a number of new products, including a portal (http:// electricvehicle.ieee. org/), conferences such as the IEVC, and formal interactions with the SAE and other organizations particularly around standards. In 2014, the initiative transitioned away from an IEEE-based and funded group to one oper-

ated by a consortium of societies. The TSC is expected to be fully involved with the new community that will emerge from the current transition discussions. More broadly, the new committee serves as a partner with other societies and entities involved in transportation.

It is interesting to note that early IAS rosters (the first roster and that in 1974) mention a Land Transportation Committee and a Marine Transportation Committee. In 1984, the Marine Transportation Committee was part of the General Industries Department [38]. It was moved to the Standards Department in 1991 [39], then in 1997 to the PCIC, where it is to this day a very active, standard-generating subcommittee (recently involved with ship-to-shore standards). It meets every year at the PCIC conference.

The Land Transportation Committee was focused on large systems, such as trains and mine haulage vehicles [40]. It co-organized a railroad conference with the American Society of Mechanical Engineers and had sessions at the IAS Annual Meeting as of 1984 [38], [40], [41]. As of 1989 [42] and to this day, the railroad conference has been very active, cosponsored on behalf of the IEEE by the Land Transportation Division of the IEEE Vehicular Technology Society

(VTS). We presume but have not confirmed that this committee moved to the VTS around 1986.

#### Renewable and Sustainable Energy Conversion Systems Committee

The RSESC was established and approved at the IAS Quarterly Executive Meeting in the fall of 2011. This committee is responsible for all matters within the scope of the IAS in which the emphasis or dominant factor specifically relates to the design, analysis, manufacture and use of electric devices and systems for sustainable energy conial applications. Topics

renewable and sustainable energy conversion industrial applications. Topics include, but are not limited to, electric generators and drives for wind turbines, ocean/marine, and other renewable and sustainable energy harvesting systems, photovoltaics, energy storage and microgrid devices, and associated electrical energy conversion systems.

A main objective of the RESESC is to increase the membership of the IEEE in general and of the IAS in particular by engaging professionals working or having an interest in the field of renewable and sustainable energy in its activities. This objec-

tive is achieved in synergy with supporting the ECCE and IEEE Transactions on Industry Applications efforts. The inaugural executive committee for the RSESC included Dan M. Ionel (United States), chair, David G. Dorrell (Australia), vice chair and TPC, Pedro Rodriguez (Spain), vice chair, and Yilmaz Sozer (United States), secretary. The first annual meeting of the committee was held during ECCE 2012 in Raleigh, North Carolina, and was attended by more than 80 people. For ECCE 2012 and 2013, the committee contributed directly to the organization of Tracks A and B, which were the largest, and also organized rap and special sessions. The committee established the connections and IAS sponsorship for international conferences such as ICERA 2012 in Nagasaki, the International Conference on Sustainable Energy Technologies 2012 in Kathmandu, EVER 2013 in Monaco, the 2013 International Conference on Power Engineering, Energy and Electrical Drives in Istanbul, the 2014 IEEE Symposium on Power Electronics and Machines in Wind Applications in Milwaukee, Wisconsin, and ICERA 2014 in Milwaukee. The inaugural round of best paper awards were presented during ECCE 2013 to authors from the United States, China, and Taiwan on topics of diagnostics of wind turbine gearboxes, photovoltaic inverters, and dc distribution systems for wind power [43]-[45].

#### Acknowledgment

We would like to thank the officers of all IPCSD Committees for their contribution to this column.

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## IAS history

## Annual Meetings and Awards



The Outstanding New Chapter Award is presented to Bahia Northeast Brazil Chapter Chair Edison da Silva (left) by IEEE Industry Applications Society (IAS) Awards Department Chair Mark Harris.

2004



Richard L. Nailen (center) is presented the IEEE Richard Harold Kaufmann Award, with IEEE Past President Mike Adler on the left and IAS President Kevin Peterson on the right.



(From left) Technical Department Chairs Don Zinger, Clayton Reid, Prafulla Pillai, and Tomy Sebastian. Prafulla Pilla was the first woman to chair an IAS Technical Department.



The presentation of the first IPCSD Gerald Kliman Award: winner Russ Kerkman (left) with Industrial Power Conversion Systems Department Chair Tomy Sebastian.



Local entertainers perform at the first IAS Annual Meeting held in Asia.



Current and past IAS presidents gather, with a view over Hong Kong harbor in background (from left): H. Landis "Lanny" Floyd II, James H. Beall, R. Mark Nelms, Robert D. Lorenz, and Kevin Peterson.



IAS President Lanny Floyd (left) congratulates newly elevated IEEE Fellow Mary Capelli-Schellpfeffer.

George W. Younkin (left), IEEE Richard Harold Kaufmann Award recipient and past IAS president, is congratulated by IEEE Division Director and IAS Past President Robert D. Lorenz.

#### 2006 (continued)



The presidents and presidents-elect of the IEEE IAS and the Institute of Electrical Engineers of Japan sign a sister society cooperation agreement.



New IEEE Fellow S. Mark Halpin (left) is congratulated by IAS Awards Department Chair Adam Skorek.



Nikola Tesla Awardee Thomas W. Nehl (left) receives a certificate from IEEE Division Director Thomas Habetler.



IAS Award Department Chair Adam Skorek (right) introduces newly elevated IEEE Fellows (from left): S. Mark Halpin, Dean Patterson, Avoki Omekanda, Peter Magyar, Wei-Jen Lee, and Akira Chiba.

2008



A member of a local tribe from Alberta, Canada, provides banquet entertainment as Awards Department Chair Adam Skorek (left) watches.



The IEEE Richard Harold Kaufmann Award is presented to Hirofumi Akagi (center) by IEEE Division Director Thomas Habetler (left) and IAS President S. Mark Halpin (right).



Officers of the Panama Chapter being recognized by Awards Department Chair Mark Harris (second from right) and Chapters and Membership Development Department Chair Suita Kulkarni (right).



Chapters and Membership Development Department Chair Peter Magyar (left) congratulates student Chapter officers from several continents.



IAS President Thomas A. Nondahl (left) chats with IAS Administrator Lynda M. Bernstein.

#### 2009 (continued)



2010



The annual gathering of IAS current and past presidents.



The IAS Andrew W. Smith Outstanding Young Member Award is presented to Wei Qiao (left) by IAS President Thomas A. Nondahl.



Student and young IAS members from Colombia at the IAS banquet.



Participants in the Chapters workshop.



Some of the members of the IAS Executive Board.



IAS Distinguished Service Award Recipient Robert D. Lorenz (right) is congratulated by IAS President Bruno Lequesne.

#### 2012



A technical discussion during a poster presentation.



IAS Women in Engineering Representative Janet Flores (left) addresses the audience while Taqua Khairy (Bahrain Student Chapter) looks on.



The oldest IAS Chapter (from Texas) celebrates in song. From left, Andrew Bluiett (Chapter chair), Megha Tak (CMD officer), Mrs. Bluiett, Bruno Lequesne (IAS president), Blake Lloyd (presidentelect), Tamas Ruzsanyi (member-at-large), and Peter Magyar (Chapters and Membership Development Department chair).



Recipients of the 2013 Graduate Student Thesis Contest Award (from left): Nikhil Valsan (third prize, India), Beáta Polgári (second prize, Hungary), Sanila C.M. (third prize, India), Evelyn Kiss (third prize, Hungary), and Mohammad B. Shadmand (second prize, United States). Taesic Kim (first prize, United States) is not pictured.

#### 2013 (continued)



A technical discussion during a poster presentation.



IAS Distinguished Service Award recipient H. Landis "Lanny" Floyd (right) is congratulated by IAS President Blake Lloyd.



The 2014 IAS Executive Board.



2014 IAS President-Elect Dave Durocher recognizes Antigoni Noula for her involvement in the student poster session.



Bridging generations.

## A History Update of the IEEE Industry Applications Society

Editor's Note: A History Update of the IEEE Industry Applications Society was created to commemorate the Society's 30th anniversary in 1995 and was the inspiration for this special issue in celebration of our 50th anniversary. The contents of the 30th anniversary publication are reprinted here for your reading enjoyment.



October 1995

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### A History Update of the IEEE Industry Applications Society

at the time of the Thirtieth Anniversary of the Society Annual Meeting October 1995

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#### Don S. Brereton, Editor IAS HISTORY October 1995

It is most appropriate to acknowledge the inspiration of Society President Barry Brusso and the support and help of the Operating Department Chairmen and the Staff Department Chairmen that made this **Society History Report** possible. Particular thanks is expressed to Tony Furfari who hunted through boxes of old files to find the pictures that are included in this report.



#### INDUSTRY APPLICATIONS SOCIETY

Barry C. Brusso President 1995 PLEASE REPLY TO: S&C Electric Co. 6601 Ridge Blvd. Chicago, IL 60626-3997 USA Tel: (312) 338-1000 Fax: (312) 338-3469 E-mail: b.brusso@ieee.org

Dear IAS Membership:

#### October 8, 1995

How do you go about retelling the story of the more than thirty years of history of our Electrical Engineering Society while capturing the essence of those who were an impact on its development and accomplishments. Herein lies the task given to 1969 Society President Don S. Brereton, with both the support of the Operating Department Chairmen and the Staff Department Chairmen, along with the assistance of the Society History Committee. Together with his illustrious colleagues he has prepared this historical document for you to enjoy and share with your peers, family and those of the engineering community.

Before the Society was formed many of its Technical Committees were associated with the Industry Division and General Applications Division of the American Institute of Electrical Engineers (AIEE). On January 1, 1963 The Institute of Electrical and Electronics Engineers, Inc. was formed. The various AIEE Technical Committees were brought together as the IEEE Industry and General Applications Group on January 1, 1965. The name was simplified and the ISGA Group qualified as a Society as of January 1, 1972 ... to become the IEEE Industry Applications Society. This transition began a significant tradition, the IAS Annual Meeting, which is celebrating its third decade as the major yearly event sponsored by the Society. This historical document provides a way to honor the dedicated members who, over the past 30 years, contributed their time and expertise for the benefit of each Annual Meeting.

I sincerely hope you find this document interesting and enlightening as you now explore the path taken by our various Technical Committees in keeping our members and their needs in the forefront of the current technologies. The leadership of the IAS has continuously attempted to provide value for the membership by providing the best quality programs and publications within the most economic package. Being conservative, the leadership has always considered the best interests of each member without compromising your needs or the financial stability of the Society. The IAS has grown over the past 30 years both in membership and status because of the deep involvement of the volunteer membership who work diligently on behalf of the Society. These volunteers are recognized in this historical document for their contributions, participation and for their commitment to our Society. People are **The Society** and we are pleased to pay homage to those who are involved because they truly like and enjoy participating with you ... the IAS members.

Sincerely,

Tak

Barry C. Brusso Society President

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

#### SOCIETY ORGANIZATION DIAGRAM



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NOTE: Complete address and phone numbers are listed in the roster of departments and committees.

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John R. Cooper Sergio Fronterotta Erling C. Hesla

Stephen W. Hagemoen Thomas M. Jahns Susumu Tadakuma

#### Society Standing Committee Chairmen

Constitution and Bylaws Financial Planning Long Range Planning Committee Nominating Baldwin Bridger, Jr Carlton E. Speck Andrew W. Smith Thomas A. Lipo

#### Annual Meeting General Chairman

Edward A. Lobnitz

SOCIETY PAST PRESIDENTS (All that are members of IEEE)

Members-at-Large

#### **OPERATING DEPARTMENTS**

#### MANUFACTURING SYSTEMS DEVELOPMENT AND APPLICATIONS DEPARTMENT

#### **Department Officers**

Chairman Vice Chairman—Papers Steven A. Larson Akram Hossain

#### **Technical Committee Chairmen**

Appliance Industry Electrostatic Processes Industrial Automation and Control Production and Application of Light C. Martin Walsh J. Sid Clements San- Tai Hwang Edward E. Hammer

#### PROCESS INDUSTRIES DEPARTMENT

Department Officers Chairman

SOCIETY COUNCIL

Chairman Vice Chairman—Technical Vice Chairman—Papers Thomas Novak Andrew W. Smith C. P. (Robbie) Robinson, Jr.

#### **Technical Committee Chairmen**

Cement Industry Metal Industry Mining Industry Petroleum and Chemical Industry Pulp and Paper Industry Rubber and Plastics Industry Textile, Fiber and Film Industry

#### INDUSTRIAL AND COMMERCIAL POWER SYSTEMS DEPARTMENT

#### **Department Officers**

Chairman Vice Chairman-Technical Vice Chairman-Papers Vice Chairman-Administration Secretary Past Chairman David S. Baker James M. Daly Robert W. Ingham Milton D. Robinson David D. Shipp John R. Cooper

#### Technical Committee Chairmen Codes and Standards

Energy Systems Power Systems Engineering Power Systems Protection Rural Electric Power Joseph J. Andrews James R. Jones Hugh O. Nash, Jr. Louie J. Powell Gregory P. Woodsmall

#### Standing Committee Chairmen

Awards and Recognition Bylaws Fellows and Senior Members Meetings Nominating Publicity/Newsletter Technical Books Coordinating Technical Review and Prize Papers Dept. Operating Committee Paul J. Riley Paul R. Casto Jeff L. Kohler Ben C. Johnson Burton M. Judson, Jr. David W. Petro Phil M. Camp

Norman T. Stringer Jerry M. Frank Robert L. Smith James H. Beall John R. Cooper Charles R. Heising William J. Moylan Robert W. Ingham David S. Baker

#### INDUSTRIAL POWER CONVERSION SYSTEMS DEPARTMENT

#### **Department Officers**

Chairman Vice Chairman—Papers Ira J. Pitel Jerry L. Hudgins

#### Technical Committee Chairmen Electric Machines

Industrial Drives Industrial Power Converter Power Electronics Devices and Components

Standing Committee Chairmen Awards and Recognition Nominating Thomas A. Nondahl Frederick C. Brockhurst Deepakraj M. Divan

V. Anand Sankaran

M. Azizur Rahman Thomas M. Jahns

#### STAFF DEPARTMENTS

#### ADMINISTRATION DEPARTMENT

**Department Officer** Chairman

Paolo Tenti

**Committee Chairmen** Awards and Recognition Energy Fellows History Membership Professional Activities Society Outstanding Achievement Award Society Distinguished Service Award

Richard S. Nichols Charles N. Claar Nady Boules Gilmore G. Cooke Clayton H. Reid Baruch Berman Thomas E. Sparling James W. Patterson

#### CHAPTERS DEPARTMENT

**Department Officer** Chairman

Caio A. Ferreira

**Committee Chairmen** Chapter Communication Chapter Development Chapter Manual Distinguished Lectureres and **Regional Speakers Program** 

**Committee Chairmen** Continuing Education Myron Zucker Grant Student Activities

Caio A. Ferreira (Acting) M. Azizur Rahman

Erling C. Hesla Mark Harris

Donald W. Novotny

SOCIETY COUNCIL

Raymond B. Sepe, Jr. S. Mark Halpin

Society Annual Meetings General Chairmen

Edward A. Lobnitz Farrokh Shokooh Pragasen Pillay Ajit Bapat William J. Moylan Thomas E. Sparling

Michael J. Foley

M. Dayne Aldridge Don S. Brereton Michael J. Foley Geza Joos

Robert J. Deaton Bernard W. Whittington Robert L. Simpson Michael J. Foley John M. Gallagher

James R. Joseph Rocco Lofaro H. Kenneth Sacks

#### EDUCATION DEPARTMENT

**Department Officer** Chairman

R. Mark Nelms

#### MEETINGS DEPARTMENT

**Department Officers** 

Chairman Society Annual Meetings Committee Society Technical Conferences Committee

PUBLICATIONS DEPARTMENT

Melvin J. Dold Charles E. Gray Stephen W. Hagemoen 1995 Annual Meeting (Orlando) 1996 Annual Meeting (San Diego) 1997 Annual Meeting (New Orleans) Members-at-Large

**Department Committees** 

Standards Coordination

Standards Awards

**NEC Nominations** ANSI Activities Safety

Glass Industry Marine Transportation Mining Safety Standards

**Committee Chairmen** TRANSACTIONS Advisory Board Chairman IEEE Industry Applications Magazine Editorial Board Chairman Society Manual Committee Chairman Society Prize Papers Committee IEEE Press Liaison

#### STANDARDS DEPARTMENT

**Department Officers** Chairman Vice Chairman

**Department Officer** 

Chairman

L. Bruce McClung Donald A. Voltz

Michael J. Foley

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#### CHAPTER CHAIRMEN

#### Region 1 (East)

Maine Established 1969 Established 1969 William F. Crowell 34 Woodridge Drive Manchester, ME 04351-9530 TEL: 1-207-791-5033 FAX: 1-207-791-5155

#### Region 1 (West)

Rochester Rochester Established 1968 Gualtiero Faustoferri 191 City View Drive Rochester, NY 14625-1344 TEL: 1-716-589-0382 FAX: 1-716-586-0382

#### Region 2 (East)

Cincinnati Dissolved 1994

Lehigh Valley Dissolved 1975

Akron Established 1965

David M. Bahich 1367 Steve Drive Akron, OH 44319 TEL: 1-216-798-2832 FAX: 1-216-798-3077

Pittsburgh Established 1965 Established 1905 F. A. (Tony) A. Furfari EE Consulting Service, Inc. 117 Washington Road Pittsburgh, PA 15221 TEL: 1-412-242-4587 FAX: 1-412-242-4587

Central New England Council

Dissolved 1994

Dissolved 1988

Established 1965 Christopher L. Mierzwa 144 Kensington Avenue Buffalo, NY 14214 TEL: 1-716-831-7228 FAX: 1-716-831-7239

Connecticut

Buffalo

Baltimore

Established 1964

Carl E. Canatella 4001 Baker Lane Baltimore, MD 21236 TEL: 1-410-296-6500 FAX: 1-410-296-3156

Area Chairman Caio A. Ferreira (Acting) Cato A. Ferreira (Acting) Sundstrand Aerospace 4747 Harrison Avenue Rockford, IL 61125-7002 USA TEL: 1-815-394-2903 FAX: 1-815-394-2053 E-MAIL: c.ferreira@ieee.org

> Columbus Established 1977 (Position Vacant)

Area Chairman James H. Beall 9836 Stephenson Drive New Port Richey, FL 34655-2028 TEL: 1-813-376-2790 E-MAIL: j.beall@ieee.org

Florida West Coast Established 1992 Debra L. Prince 2501 Leslee Lake Drive St. Petersburg, FL 33713 TEL: 1-813-866-4180 FAX: 1-813-866-4947

> Nashville Established 1988 Robert A. Kennedy 200B Weakkey Road Smyrna, TN 31217 TEL: 1-615-459-8585 FAX: 1-615-459-0002

Alabama Established 1972 Warren A. Henson 1605 Fair View Drive Birmingham, AL 35244 TEL: 1-205-972-6407

Memphis Established 1989 William L. Allen, Jr. 602 Sanga Circle Cordova, TN 38018 TEL: 1-901-528-4131 FAX: 1-901-528-4087

> Orlando Established 1969 Issa Patarseh University of Central Florida Orlando, FL 32826-2399 TEL: 1-407-823-0185 FAX: 1-407-386-6269

New York, Long Island Established 1966 Lewis E. Ettlinger 38 Johnson Place Woodmer, NY 11598 TEL: 1-212-998-1425 FAX: 1-212-995-4025

Schenectady Established 1965 Edward L. Owen 308 Trinacria Court Schenectady, NY 12303 TEL: 1-518-385-3012 FAX: 1-518-385-5583

Delaware Bay Delaware Bay Established 1966 Wyman J. Priester, III 9 Cook Road Newark, DE 19711 TEL: 1- 302-774-1194 FAX: 1-302-774-1352 E-MAIL: prister@engg.dnet.dupont.com

Washington DC/North Virginia Established 1980 William G. Regotti 2811 Legenary Court Silver Spring, MD 20906 TEL: 1-202-662-8900

> Cleveland Established 1967 Established 1967 L. W. Bruehler 1500 West 3rd Street Clevveland, OH 44106 TEL: 1-216-523-3413 FAX: 1--216-523-5922

Dayton Established 1968 Daniel D. Dull 538 Viking Landing Court Beavercreek, OH 45434-7338 TEL: 1-513-331-4577 FAX: 1-513-331-4673

**Region 3** 

Region 2 (West)

Atlanta Atlanta Established 1970 William F. Bell, Jr. 4203 Hideaway Drive Tucker, GA 30084 TEL: 1-404-393-1220 FAX: 1-404-393-1332

Miami Miami Established 1978 Abdul H. Samra Florida International Univ. Dept. of Electrical & Computer Eng. Miami, FL 33199 TEL: 1-305-348-2115 FAX: 1-305-348-3707 E-MAIL: samraa@servax.flu.edu Eastern North Carolina Established 1975 John B. Dagenhart 5540 McNeely Drive Raleigh, NC 27622 TEL: 1-919-782-7745 Middle Tennessee Dissolved 1993

Eastern North Carolina

Virginia Mountain Established 1975 Walter A. Hill 6232 Hidden Valley Drive Roanoke, VA 24018 TEL: 1-703-387-8619 FAX: 1-703-387-8651

North Jersev/Princeton Established 1980 Kenneth J. Oexle 11 Deerfield Road Whippany, NJ 07981 TEL: 1-201-455-8481 FAX: 1-201-386-1156

Syracuse Syracuse Established 1965 Michael R. Hayes PO. Box 4753 Syracuse, NY 13221 TEL: 1-315-457-1210 FAX: 1-315-457-7359 E-MAIL: MRH44@AOL.COM

Philadelphia Established 1965 Steven Lapidus 429 Elm Avenue Riverton, NJ 08077 TEL: 1-201-313-7821

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Area Chairman

Area Chairman

Area Chairman

Dave M. McCombe Project Enterprises, Inc. P.O. Box 10498 Pittsburgh, PA 15234 TEL: 1-412-341-5777

Caio A. Ferreira (Acting) Sundstrand Aerospace 4747 Harrison Avenue Rockford, IL 61125-7002

TEL: 1-815-394-2903 FAX: 1- 815-394-2053 E-MAIL: c.ferreira@ieee.org

Area Chairman Walter Faustoferri Hyclotek, Inc. Engineering & Consulting 191 City View Drive Rochester, NY 14625 TEL: 1-716-586-0382 FAX: 1-716-586-0382

#### CHAPTER CHAIRMEN **Region 4**

Central Illinois

Dissolved 1975

Area Chairman Area Charrman Frank J. Lietz Allen-Bradley Co., Inc. Motion Control Division 6400 West Enterprise Dr. Mequon, WI 53092 TEL: 1-414-242-8273 FAX: 1-414-242-8300

> Rock River Valley Rock River Valley Established 1992 Mark Harris P.O. Box 7002 4747 Harrison Ave. Rockford, IL 61125 TEL: 1-815-226-6098 FAX: 1-815-394-2497 E-MAIL: m.harris@ieee.org

Calumet Catimet Established 1968 Duane R. Hibbs US Highway 12 Portage, IN 46368 TEL: 1-219-763-5703 FAX: 1-219-763-5900

> South East Michigan South East Michigan Established 1965 Brian Harrington 32540 Schooleraft Road Livonia, MI 48151-2643 TEL: 1-313-513-0330 E-MAIL: 76371-3314@compuserve.com

Chicago Established 1965 Irwin C. Smiley 244 Sunset Drive Wilmette, IL 60091 TEL: 1-312-648-1700

Toledo Established 1970 Established 1970 Joseph A. Couturier 6928 Barnsworth Sylvania, OH 43560 TEL: 1-419-893-6250 ext. 223 FAX: 1-419-893-6115 Milwaukee Established 1966 Todd R. Suave 710 E. Quail Run Oak Creek, WI 53154 TEL: 1-414-382-3599 FAX: 1-414-382-6821 E-MAIL: trsuave@abpost.remnet.ab.com

Milwaukee

Houston Established 1967

Wichita

Established 1967 Nabil A. Arnaout 19815 Ricewood Way Katy, TX 77449 TEL: 1-713-235-5235 FAX: 1-713-235-4590

Wichita Established 1970 Ward T. Jewell 1845 N. Fairmont Ave. P.O. Box 44 Wichita, KS 67208 TEL: 1-316-689-3415

Twin Cities Established 1971 Paul E. Hellen 1717 Wakonade Drive East Welch, MN 55089-9642 TEL: 1-612-388-1121 ext. 4987 E-MAIL: usnspinp@ibmmail.com

Area Chairman Howard Bradfield Howard Bradheld Bechtel, Inc. P.O. Box 2166 Houston, TX 77252-2116 TEL: 1-713-235-2528 FAX: 1-713-235-8545

Oklahoma City Established 1978 Marvin E. Van Bebber 1702 Windsor Place Oklahoma City, OK 73116 TEL: 1-405-272-3075

Baton Rouge Established 1975 Lynwood W. Gordon 11007 Toledo Bend Ave. Baton, Rouge, LA 70814 TEL: 1-504-359-5635 FAX: 1-504-359-5635

> St. Louis St. Louis Established 1965 Craig T. Hartman P.O. Box 31494 Des Peres, MO 63131 TEL: 1-314-230-5467 FAX: 1-314-361-2772

Dallas Established 1978 Established 1978 Rodney Welch Suite 1508 12700 Park Central Drive Dallas, TX 75251 TEL: 1-214-788-1508 FAX: 1-214-788-1583

Region 5

Established 1973 James P, Houilhan 6408 N, Wind Hollow Court P.O. Box 1248 Paker, CO 80134 TEL: 1-303-841-8982 FAX: 1-303-841-6008

Seattle

Established 1973

Tulsa *Established 1977* R. E. Linton 7444 East 29th Street Tulsa, OK 74129 TEL: 1-918-627-5175

Denver

#### Region 6 (North)

Portland Established 1971 Ting-Kwong Yee 18055 Northwest Bartley Ct. Beaverton, OR 97006 TEL: 1-503-642-8744 FAX: 1-503-649-4728

Region 6 (South)

Oakland East Bay Established 1975 Charles E. McCoy, Jr. 2378 Wayne Street Martinez, CA 94553 TEL: 1-510-228-5124

San Francisco San Francisco Established 1964 Marcelo E. Valdes 1340 Treat Blvd., Suite 200 Walnut Creek, CA 94596 TEL: 1-510-256-2552 FAX: 1-510-256-2571

Seattle Established 1967 Dennis Bogh Suite 300 1605 N.W. Sammamish Rd. Issaquah, WA 98027 TEL: 1-206-557-3039 FAX: 1-206-557-3025

Orange County Established 1983 Established 1963 Matt Strong 13191 Cross Roads Pkwy. Suite 205 City of Industry, CA 91746 TEL: 1-310-699-0032 ext. 262 FAX: 1-310-695-1471

Santa Clara Valley Santa Ciara Valley Established 1993 Rambabu Adapa 3412 Hillview Avenue Palo Alto, CA 94303 TEL: 1-415-855-8988 FAX: 1-415-855-2954 E-MAIL: radapa@paloalto.epri.com

# SOCIETY COUNCIL

Area Chairman Curt R. Eckberg C. R. Eckberg & Son 22641 10th Ave. S. Seattle, WA 98198 TEL: 1-206-867-6762 FAX: 1-206-878-4434

Oregon Phoenix Established 1971 Michael R. Garretson 13275 SE Johnson Rd. Milwaukee, Oregon 97222 TEL: 1-503-653-6781 FAX: 1-503-659-9733 FAX: 1-503-659-9733 Dissolved E-MAIL:michael@ee.pdx.edu

Area Chairman Kevin L. Peterson PSI Engineers, Inc. 4010 Watson Plaza Drive Suite 140 Suite 140 Lakewood, CA 90712-4045 TEL: 1-310-497-2999 FAX: 1-310-497-2990 E-MAIL: klp@psieng.com

> Sacramento Established 1966 Lt. Col. Michael L. Gravely 5120 Dudley Blvd., Suite 1 McClellan AFB, CA 95652-1351 TEL: 1-916-643-6570 FAX: 1-916-543-0345

Los Angeles Established 1965 Magdy E. Youssef TRW TRW 1 Space Park, Bldg 140/2101 Redondo Beach, CA 90278 TEL: 1-310-812-4170 FAX: 1-310-812-4149

Spokane Spokane Established 1978 Paul Cote South 2750 Early Dawn Lane Verdale, WA 99037 TEL: 1-509-891-7514

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#### CHAPTER CHAIRMEN

#### **Region 7**

**Region 8** 

Poland

Region 9

Hamilton/Niagara Established 1972 Daniel J. Crosthwaite 51 Eastbourne Avenue Hamilton, Ontario L&M-2M6 Canada TEL: 1-416-675-5950 ext. 5104

Montreal Established 1973 Established 1973 Vijay K. Sood 8405 Pelletler Blvd. Brossard, Quebec J4X-1P7 Canada TEL: 1-514-652-8180 FAX: 1-514-652-8180 FAX: 1-514-652-8180 E-MAIL: sood@ireq-sim.hydro.qc.ca

Portugal

Established 1991

E-MAIL: emisin

Rio de Janeiro

Rio de Janeiro Established 1987 Edson H. Watanabe Rue Sa Viana 112/303 Rio de Janeiro, RJ, Brazil 20540-260 TEL: 55-21-280-8832 FAX: 55-21-290-8626

Established 1991 Ines Castro Simas Rua Cidade de Beira 76 6 Dir 1800 Lisboa, Portugal TEL: 351-1-847-3285 FAX: 48-22-127535

Northern Canada Established 1987 Established 1987 Darin Hucul 1100, 9700 Jasper Avenue Edmonton, Alberta T5J-4E6 Canada TEL: 1-403-495-5165

Vancouver Established 1966 Established 1966 Henry C. Ng 661 Andover Crescent West Vancouver, British Columbia V7S-1Y4 Canada TEL: 1-604-926-0736 FAX: 1-604-664-3335

> South Africa Established 1990

Established 1990 J. A. Ferreira P.O. Box 524 Johannesburg 2000, South Africa TEL: 27-11-489-2598 FAX: 27-11-489-2466 E-MAIL: jaf@ing1.rau.sc.za

South Brazil South Brazil Established 1984 Reginaldo Vinha Rua Santos Dumont 1235 Ap 22 Santos, SP, Brazil TEL: 55-13-232-2131

Guiarat Gujarat Established 1980 Dr. A. K. Aggarwal Gujarat University 6. Prof. Row House Nr. Gujurat University Guest House Navrangpura Ahmedabad, India 390011 TEL: 91-272-440164 FAX: 91-272-400144

Madras Established 1984 N. Kanthimathinathan 15 Fifth Street Padmanabhanagar, Madras, India 600020 TEL: 91-44-458950 FAX: 91-44-416789

Tokyo Established 1973 Established 1973 Susumu Tadakuma 2-17-1 Tsudanuma, Narashino-Shi Chiba, Japan 275 TEL: 81-474-78-0359 FAX: 81-474-78-0379

Area Chairman Area Charman Moshe Harpaz Kibutz Ein-Carmel D. N. Hof-Carmel 30860 Israel TEL: 972-3-752-5181 FAX: 972-4-984-4222

Area Chairman

William D. Greason Univ. of Western Ontario Faculty of Engrg. Science London, Ontario N6A-5B9 Canada TEL 1 50 661 2122

TEL: 1-519-661-2132 FAX: 1-519-661-3808

Southern Alberta

Soundri Andria Established 1979 Robert L. Anderson 155 Stradwick Rice SW Calgary Alta, Alberta T3H-1G7 Canada TEL: 1-403-268-2860 FAX: 1-403-246-7407

Israel

Established 1986

Established 1986 Moshe Harpaz Kibbutz Ein-Carmel D. N. Hof—Carmel, 30860 Israel TEL: 972-3-752-5181 FAX: 972-4-984-4222

Рапата

Established 1984

Established 1984 Evaristo Alvarez Santos Apartado 65 Panama City, Panama TEL: 507-29-4033 FAX: 507-29-1600

Canadian Atlantic

Established 1989 Robert W. Creighton 106 Rigevale Drive Bedford, Nova Scotia B4A-3R2 Canada

TEL: 1-902-428-6877 FAX: 1-902-428-2269

E-MAIL: robert.creighton@nspower.ns.ca

Area Chairman Francisco Renno Neto Francisco Renno Neto Avenida, Ana, Costa, 300 Santos, Sao Paulo, Brazil 11060 TEL: 55-132-33-3069 FAX: 55-132-33-4021

Mexico Established 1974 Established 1974 Juan Yebra Moron Valle De Las Animas 202 Pachuca Hgo, Mexico 42000 TEL: 52-5-271-0007 FAX: 52-5-272-1657

> Area Chairman Caio A. Ferreira (Acting) Sundstrand Aerospace 4747 Harrison Avenue Rockford, IL 61125-7002 USA TEL: 1-815-394-2903 FAX: 1-815-394-2053 E-MAIL: c.ferreira@ieee.org

Hong Kong Hong Kong Established 1983 Gilbert K. Li Hong Kong Polytechnic Univ. Electrical Engineering Dept. Hung Hom Kowloon, Hong Kong TEL: 852-766-6187 FAX: 852-330-1544

> New Zealand North Established 1972 Peter H. Over P.O. Box 16-149 Sandringham, Aukland, New Zealand 3 TEL: 64-9-626-6019

North Italy Established 1994 Established 1994 Luigi Malesani Via Antoniazzi 6 Padova, Italy 35100 TEL:39-49-828-7507 FAX: 39-49-828-7599

South Saskatchewan

Established 1990 Dan Ruiu 2025 Victoria Avenue Regina, Saskatchewan S4P-0S1 Canada TEL: 1-306-566-2992 FAX: 1-306-566-3054

Established 1990

Bahia Established 1989 Jose Peralta Av Luis Viana Filho 2210 Sala 301, Imbui Salvador Bahia, Brazil 41730-000 TEL: 55-71-231-8424 FAX: 55-71-371-3214

Established 1990 Eduardo P. Wiechmann Casilla 53-C Concepcion, Chile TEL: 56-4-123-4985 FAX: 56-4-122-2712

Chile

Established 1992 Wieslaw J. Seruga Senatorska 20 M 23 00-095 Warszawa, Poland TEL: 48-22-122039 FAX: 48-22-127535

Toronto

Established 1969

Established 1969 Alan E. Wallis 3 Tillman Cir. Markham, Ontario L3P-4T9 Canada TEL: 1-416-445-4844

Puerto Rico Puerto Rico Established 1994 Rene Di Cristina P.O. Box 364487 San Juan, Puerto Rico 00936-4487 TEL: 809-783-3000

#### Region 10

Bangalore/Bombay Calcutta/Delhi Established 1980 Established 1980 Pradeep Madan Sae I Ltd. 29-30 Commercial Centre Basant Lor Vasant Vimar New Delhi, India 110 062 TEL: 91-21-688 -5011 FAX: 91-11-686-4532

Hyderabad Hyderabad Established 1992 C. Satish 10-5-3/2/6 Masab Tank Hyderabad, India 500028 TEL: 91-40-228641 ext. 277 FAX: 91-40-227648

> Singapore Sanujib K. Fanda 10 Kent Ridge Crescent Singapore, Singapore 0511 TEL: 65-772-6484 FAX: 65-777-3117

Beijing Established 1995 Xiaoliang Ma Xiaoliang Ma Tianjin Design & Research Institute of Electrical Drives Tianjin, China 300180 FAX: 86-22-439-1813

Kerala Established 1989 Isaac J. Mackadayil Keltron Karakulam Trivandrum, India 695564 TEL: 91-0471-69551 nas@beta.ist.uti.pt El Salvador Established 1989 (Position Vacant)

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# SOCIETY COUNCIL

#### SOCIETY PRESIDENTS AND SOCIETY ANNUAL MEETINGS

#### PAST AND PRESENT SOCIETY PRESIDENTS

1965-1966		Robert B. Moore	1981	*	George F. Bobart
1966-1967	*	Carl R. Olson	1982	*	Bernard W. Whittington
1968	*	James L. Cooney	1983	*	George W. Walsh
1969	<b>‡</b> #*	Don S. Brereton	1984	*	Richard S. Nichols
1970	*	Harold G. Frostick	1985	<b>*#*</b>	Richard S. Nichols
1971	*	Arthur M. Killin	1986	<b>##</b> *	E. G. (Al) Kiener
1972	#*	Irvin N. Howell, Jr.	1987	*	Robert B. Voller
1973		Walter R. (Joe) Harris	1988	<b>##</b> *	Lloyd A. (Pete) Morley
1974	*	George W. Younkin	1989	*	Eugene J. Fagan
1975		John F. Cachat	1990	*	Linos J. Jacovides
1976	#*	F. A. (Tony) Furfari	1991	*	Ronald M. Jackson
1977	*	Robert V. Wachter	1992	*	M. Dayne Aldridge
1978	*	Edward A. E. Rich	1993	*	Baldwin Bridger, Jr.
1979	*	H. Paul Meisel	1994	*	Thomas A. Lipo
1980	#*	James H. Beall	1995	*	Barry C. Brusso

\*Members of the Society Council

#Also served as Division II Director ‡Also served as IEEE Officer

#### PAST AND PRESENT SOCIETY ANNUAL MEETINGS

1966	Chicago, IL	1981	Philadelphia, PA
1967	Pittsburgh, PA	1982	San Francisco, CA
1968	Chicago, IL	1983	Mexico City, Mexico
1969	Detroit, MI	1984	Chicago, IL
1970	Chicago, IL	1985	Toronto, ON
1971	Cleveland, OH	1986	Denver, CO
1972	Philadelphia, PA	1987	Atlanta, GA
1973	Milwaukee, WI	1988	Pittsburgh, PA
1974	Pittsburgh, PA	1989	San Diego, CA
1975	Atlanta, GA	1990	Seattle, WA
1976	Chicago, IL	1991	Dearborn, MI
1977	Los Angeles, CA	1992	Houston, TX
1978	Toronto, ON	1993	Toronto, ON
1979	Cleveland, OH	1994	Denver, CO
1980	Cincinnati, OH	1995	Lake Buena Vista, FL

#### IEEE TECHNICAL FIELD AWARD AND SOCIETY AWARDS

#### IEEE RICHARD HAROLD KAUFMANN AWARD

988	
989	
990	
991	

Walter C. Huening, Jr.	1992	Kao Chen
Bernard W. Whittington	1993	George W. Walsh
René Castenschiold	1994	Daniel J. Love
John R. (Dunki) Dunki-Jacobs	1995	M. Shan Griffith



Those pictured were present for the first presentation of the IEEE Richard Harold Kaufmann Award to Walter C. Huening, Jr. on October 4, 1988. From left to right: Dr. Esther Conwell (Chairman of the IEEE Awards Board), Mrs. Joyce Sleeper (daughter of Mr. & Mrs. Kaufmann), Mrs. Aileen M. Kaufmann (receiving a copy of the new IEEE Technical Field Award named after her dedicated husband), and Don S. Brereton (former Society President and member of the IEEE Awards Board).

#### PAST IAS OUTSTANDING ACHIEVEMENT AWARD RECIPIENTS

1969	Robert B. Moore	1982	Anthony C. Lordi
1970	Charles F. Dalziel	1983	Ion I. Inculet
1971	Don S. Brereton	1984	Russell W. Mills
1972	Boris Mokrytzki	1986	Thomas A. Lipo
1973	Robert V Wachter	1988	C. Curtis Herskind
1974	Harold Winograd	1989	Donald K. Ross
1975	Walter R. Harris	1990	George W. Walsh
1976	Ralph H. Lee	1991	Thomas E. Sparling
1977	Irvin N. Howell	1992	M. Azizur Rahman
1978	Richard Harold Kaufmann	1993	Bimal K. Bose
1979	Frank A Furfari	1994	Ray P. Stratford
1980	Richard M. Emberson	1995	C. James Erickson
1981	Edward A. E. Rich		

#### PAST IAS DISTINGUISHED SERVICE AWARD RECIPIENTS

1988	George W. Younkin	1992	James W. Patterson
1989	Richard S. Nichols	1993	Daniel L. Goldberg
1990	James H. Beall	1994	Eugene J. Fagan
1991	E. G. (Al) Kiener	1995	Lloyd A. (Pete) Morley

#### IEEE MEDALS, IEEE TECHNICAL FIELD AWARDS AND IEEE SERVICE AWARD

1984	IEEE Lamme Medal	
1984	IEEE Charles Proteus Steinmetz Award	
1985	IEEE Lamme Medal	
1985	IEEE Haraden Pratt Award	
1990	IEEE Charles Proteus Steinmetz Award	
1995	IEEE Charles Proteus Steinmetz Award	
1995	IEEE Nikola Tesla Award	

William McMurray H. Baron Whitaker Loren F. Stringer Don S. Brereton Warren H. Cook L. Bruce McClung Thomas A. Lipo

#### SOCIETY OPERATING DEPARTMENT CHAIRMEN

#### **TECHNICAL OPERATIONS** DEPARTMENT CHAIRMEN

1965-1967	Willard H. Dickinson
1968-1969	Robert A. Zimmerman
1969-1970	W. R. (Joe) Harris
1971-1972	Alfred F. Leatherman
1973	W. Herbert Bixby

#### Vice Chairman—Industry Operations 1972-1973 Harold W. Rice

#### Vice Chairmen—Technological Operations

1972	W. Herbert Bixby
1973	William L. Wachs

#### INDUSTRY OPERATIONS DEPARTMENT CHAIRMEN

	DUIMENT	TENTE CHITERITENT
1974		Edward A. E. Rich
1975-	-1976	William L. Wachs

#### **TECHNOLOGY OPERATIONS** DEPARTMENT CHAIRMEN

DETTIN	MENT CHAINEN
1974	Boris Mokrytzki
975-1976	Harold W. Rice

#### **PROCESS INDUSTRIES** DEPARTMENT CHAIRMEN

1977	Carl A. Napor
1978	Samuel P. Axe
1979	Richard L. Curran
1980-1981	Al M. Newcome
1982	L. A. (Pete) Morley
1983-1984	Eugene J. Fagan
1985	David Victor
1985-1986	C. L. (Curt) Ivey
1987-1989	M. Dayne Aldridge
1990-1991	C. P. (Robbie) Robinson, Jr.
1992-1993	Fred C. Trutt
1994-To Date	Thomas Novak

#### **GENERAL INDUSTRIES** DEPARTMENT CHAIRMEN

1977-1978	Robert E. Sand
1979	John R. Flynn
1980-1981	C. D. Lambert
1982-1983	Nicholas E. Gatzios
1984-1987	William W. Weil
1988-1989	Steven E. Collier
1990	Bruce A. Jackson

#### INDUSTRIAL AND COMMERCIAL POWER SYSTEMS DEPARTMENT CHAIRMEN

1977-1978	George W. Walsh
1979-1980	Derio Dalasta
1981-1982	M. Shan Griffith
1983-1984	James W. Patterson
1985-1986	Thomas E. Sparling
1987-1988	Baldwin Bridger, Jr.
1989-1990	Richard H. McFadden
1991-1992	Pat O'Donnell
1993-1994	John R. Cooper
1995-To Date	David S. Baker

#### INDUSTRIAL POWER CONVERSION SYSTEMS DEPARTMENT CHAIRMEN

1977-1980	David W. Borst
1981-1982	Victor R. Stefanovic
1983-1985	Loren F. Stringer
1986-1987	Linos J. Jacovides
1988-1989	Dale L. Ashcroft
1990-1991	Thomas A. Lipo
1992-1993	Thomas M. Jahns
1994-To Date	Ira J. Pitel

#### INDUSTRIAL UTILIZATION SYSTEMS DEPARTMENT CHAIRMEN

1977-1978	John H. Karlson
1979-1980	Robert M. Yurkanin
1981-1984	E. G. (Al) Kiener
1985-1987	Kao Chen
1988-1989	Joh K. Edwards
1990-1991	Mohammed Safiuddin
1992	Carlton E. Speck

#### MANUFACTURING INDUSTRIES DEPARTMENT CHAIRMAN

1990-1992	William P. Jezo

#### MANUFACTURING SYSTEMS DEVELOPMENT AND APPLICATIONS DEPARTMENT CHAIRMEN

1993	Carlton E. Speck
1994-To Date	Steven A. Larson

## History of the Manufacturing Systems Development and Applications Department

STEVEN A. LARSON, Senior Member, IEEE Chairman, Manufacturing Systems Development and Applications Department

Trresistible forces of new technologies confronting immovable objects of old applications. This paradigm aptly represents the historical legacy of the Manufacturing Systems Development and Applications Department (MSDAD). A study of this heritage uncovers an extensive record of volunteer service to industry and the profession wherein the new has been continually mingled with the old; i.e., new ideas and creative concepts being applied to basic human needs and wants.

The MSDAD, one of the four operating departments in the present-day IAS, is a relatively new organizational unit having been created in 1993 by way of a merger between the Industrial Utilization Systems Department (IUSD) and the Manufacturing Industries Department (MID). The IUSD was formed during the 1977 restructuring of the IAS. The MID was created in 1990 in recognition of the importance of manufacturing technologies in the world economies.

 $F = \frac{q_1 q_2}{q_2}$ 

MANUFACTURING SYSTEMS DEVELOPMENT AND APPLICATIONS DEPARTMENT

But in order to fully understand the history of the MSDAD, it is necessary to examine the development through the years of the various technical committees that have played a part in the evolution of PROCESSES COMMITTEE the present-day MSDAD. These committees, though seemingly diverse in their

ELECTROSTATIC

scopes of interest, are portions of a single fabric that has been woven with the common thread of "manufacturing systems." And all of these committees share a history of persistent striving to optimize the productivity, energy efficiency, safety and environmental impact of manufacturing processes.



The origins of the four technical committees that now operate under the MSDAD flag may be traced back to the AIEE, one of the two predecessor organizations of the IEEE. The Production and Application of Light Committee (PALC), created in 1909, may be the oldest technical committee within the IAS. The Electrostatic Processes Committee (EPC)

originated in the late 1940's. Both of these committees have been under the IUSD/MSDAD umbrella since 1977. The Appliance Industry Committee (AIC), whose records may be traced back to 1950, was put in the General Industries Department (GID) in the restructured IAS of 1977. The AIC remained under the GID until 1990 when it was moved to the newly formed MID. The AIC was then transferred to the MSDAD in 1993.

The history of the fourth MSDAD committee, the Industrial Automation and Control Committee (IACC), has been influenced by the rapid and sometimes chaotic advances in the domain of computerized control. Six technical committees must be mentioned in this Committees must be interested biotoxical OF LIGHT COMMITTEE part of the story as being of historical



significance to the MSDAD researcher: Applied Automation (AAC), Electric Process Heating (EPHC), Industrial Control (ICC), Machine Tools Industry (MTIC), Machine Tools, Robotics and Factory Automation (MTRFAC), and Robotics Industry (RIC).

The ICC, which is the core committee in this group, and the EPHC both originated in the AIEE prior to 1950. The history of the four other committees mentioned above is contained within the decades since 1950, culminating in a final merger with the ICC in 1993 to form the present-day IACC.



INDUSTRIAL AUTOMATION AND CONTROL COMMITTEE

Building on the information presented in the technical committee histories [1] published in 1984, the chairmen of the various committees of interest to MSDAD are presented below, from 1985 to the present.

Appliance Industry - D. Baron (85), C. M. Walsh (86-89, 94-95), E. Mierzwinski (90-93),

Applied Automation - W. W. Weil (92)

Electric Process Heating - W. Killian (85-87), R. W. Yurkanin (89-91) Electrostatic Processes - W. D. Greason (85), T. B. Jones (86-87),

K. S. Robinson (88-89), C. E. Speck (90-91), A. A. Elmoursi (92-93), J. S. Clements (94-95)

Industrial Automation and Control - A. Hossain (93), P. Lin (94), S. Hwang (95)

Industrial Control - M. Saffiuddin (85-87), G. Chen (88),

S. A. Larson (89-91), A. Hossain (92)

Machine Tools Industry - G. W. Younkin (85), D. M. Tome (86) Machine Tools, Robotics and Factory Automation - A. W. Scheide (87), M. R. Cesarz (88), W. W. Weil (89 - 91)

Production and Application of Light - D. K. Ross (85-86), T. K. McGowan (87-88), J. D. Stolsheck (89-90), E. E. Hammer (91-95) Robotics Industry - A. W. Scheide (85-86)

#### REFERENCE

[1] IEEE/IAS Trans., vol. IA-20, No. 4, July/August 1984. IEEE INDUSTRY APPLICATIONS MAGAZINE • JAN | FEB 2015 • WWW.IEEE.ORG/IAS
# History of the Process Industries Department

Thomas Novak, IEEE Senior Member Chairman, Process Industries Department

oday's IAS Process Industries Department (PID) consists I of seven very diversified technical committees-(1) Cement, (2) Metal, (3) Mining, (4) Petroleum and Chemical, (5) Pulp and Paper, (6) Rubber and Plastics, and (7) Textile, Fiber, and Film Industry Committees. Although the organizational structure and technical interests of each committee are varied, there is a common thread that binds them-a dedication to the technical enhancement of a specific process industry. In essence, each technical committee of the Process Industries Department provides a means through which engineers in operations, manufacturing, consulting, academia, and government can exchange information on subjects of mutual interest for the benefit of their industries. The Process Industries Department is merely a two-way communications channel between its technical committees and the IAS Executive Board. The organizational structure of the Department consists of a Chairman, a Vice Chairman-Technical, and a Vice Chairman-Papers; and each technical committee has a chairman as well as its own slate of officers. The Department Chairman represents the Department as a member of the IAS Executive Board.

Given the fundamental need for technology transfer, it is easy to see why the origins of some technical committees within the Process Industries Department date back before the formation of the IEEE and its Industry and General Applications Group, the predecessor to the Industry Applications Society. On January 1, 1963, the American Institute of Electrical Engineers (AIEE) and the Institute of Radio Engineers (IRE) joined forces to form the Institute of Electrical and Electronics Engineers (IEEE). Shortly after, on January 1, 1965, the Industry and General Applications Group was formed, and all seven of the present PID technical committees then existed as part of the Technical Operations Department, as shown in Figure 1.

In a few years, the Industry and General Applications Group qualified for Society status, and on January 1, 1972 officially became the IEEE Industry Applications Society. In 1974, the Technical Operations Department was divided into the Industry Operations Department and the Technology Department. Again, all seven of the present PID technical committees became part of the Industry Operations Department, as shown in Figure 2. To further improve the administration and support of the technical committees, the two technical operating departments were divided into five operating departments in 1977. Two of the departments were dedicated toward serving various industries—the Process Industry Department, with eight technical committees, and the General Industries Department, with seven technical committees. Since 1977, the only major change to the organizational structure of the Process Industries Department was the removal of the Glass Industry Committee, which left the seven present-day technical committees remaining.

Through the years, the size, organizational structure, and technical interests of each committee have evolved based upon the diversified needs and the economic health of its associated industry. As a result, the size and activity level of the committees vary greatly, and no two committees function exactly alike, which is evident by the various types of subcommittees, the sponsorship of technical conferences, the degree of involvement in the IAS Annual Meeting, and the types and topics of sponsored technical sessions. A short description of each committee follows:

The Cement Industry Committee is responsible for all matters within the scope of the IAS that directly relate to the manufacture of cement. During the month of May, the Committee sponsors an annual technical conference with two days of technical sessions. Attendance ranges from 500 to 1000 people. Conference sites are selected so that attendees may tour one or more modern cement plants.

The Metal Industry Committee is responsible for all matters within the scope of the IAS that directly relate to the making, shaping, or treating of metals. The Committee is relatively small and holds a yearly business meeting in conjunction with a tour of a metal production or processing facility. The Committee also sponsors technical sessions at the IAS Annual Meeting.

The Mining Industry Committee is responsible for all maters within the scope of the IAS that directly relate to mining and related operations. This relatively small committee provides technical cooperation for the biannual WVU International Mine Electrotechnology Conference. The Committee also sponsors technical sessions at the IAS Annual Meeting.

The Petroleum and Chemical Industry Committee is responsible for all matters within the scope of the IAS that directly relate to the production, manufacturing, and transportation of petroleum and chemical products. The PCIC is by far the largest committee within the Process Industry Department. The Committee is extremely active and sponsors an annual technical conference which is generally held in September at various locations in the United States and Canada. The program consists of sessions sponsored by the General Program, Refining, Chemical, Production, Safety, Transportation, and Electro-chemical Subcommittees. Conference attendance ranges from 600 to 1200 people.

The Pulp and Paper Industry Committee is responsible for all matters within the scope of the IAS that directly relate to the

manufacture and fabrication of pulp and paper products. The Technical Operations Subcommittee sponsors an Annual Spring Meeting at various locations throughout the United States and Canada. One day is devoted to a full-committee business meeting, with three days dedicated to technical sessions. Attendance typically ranges from 350 to 500 people.

The Rubber and Plastics Industry Committee is responsible for all matters within the scope of the IAS that directly relate to the manufacture of rubber and plastics. The Committee sponsors an annual conference which is usually held in Akron, OH during the month of April. Typical attendance has been approximately 100 people per session. This year's conference was canceled; however, the Committee also sponsors technical sessions at the IAS Annual Meeting.

The Textile, Fiber, and Film Industry Committee is responsible for all matters within the scope of the IAS that directly relate to the textile, fiber, film, carpet, yarn, fabric and nonwoven process industries. The Committee sponsors an annual two-day technical conference.

Depending upon the size and needs of the technical committees, their organizational structure may include subcommittees, such as: an executive subcommittee, working groups for the creation of standards or guidelines, a technical program subcommittee, a membership subcommittee, a paper-review subcommittee, a standards subcommittee, and an awards committee. Also, the technical interests of a committee span a broad cross-section of topics that are related to the committee's associated industry and may include: industrial power system design, analysis, and operation; protective relaying; automation; monitoring and control; preventive and predictive maintenance; electrical safety and grounding; lighting; and applications of electric machines and their associated drives.

In conclusion, all technical committees operate on a somewhat independent and autonomous basis, but always under the umbrella of the IEEE Industry Applications Society.

	Technical O	perating Department
	TECHNICA	L COMMITTEES
Cement Industry		Marine Transportation
orrosion and Cathodic Pro	lection	Metal Industry
Comestic Appliance Industry		Mining Industry
Electric Process Heating		Petroleum and Chemical Industry
Electric Space Heating and	Air Conditioning	Power Semiconductor
Sectric Welding		Production and Application of Light
Nectrostatic Processes		Putp and Paper industry
Seneral Industry Application	3	Rubber and Plastics Industry
ndustrial and Commercial P	ower Systems	Rural Electric Power
ndustrial Control		Static Power Converter
and Transportation		Textile industry
Aachine Tool Industry		1
	GENERAL	COMMITTEES
A Genue Salahu Llaison		IGA Group Standards

Figure 1. The First Organization of the IGA Group Technical Operating Department.

	Technical Operating Department
	TECHNICAL COMMITTEES
INDUSTRY COMMITTEES	TECHNOLOGY COMMITTEES
Comont Industry	Corrosion and Cathodic Protection
Domestic Appliance Industry	Electric Process Heating
General Industry Applications	Electric Space Heating and Air Conditioning
Glass Industry	Electrostatic Processes
Land Transportation	Industrial and Commercial Power Systems
Machine Tool Industry	Industrial Control
Marine Transportation	Power Semiconductor
Metal Industry	Production and Application of Light
Mining Industry	Static Power Converter
Petroleum and Chemical Industry	
Pulp and Paper industry	
Rubber and Plastics Industry	
Rural Electric Power	
Without the second	1

Figure 2. The Technical Operating Department in 1974.

# History of the Industrial and Commercial Power Systems Department

David S. Baker, IEEE Senior Member Chairman, Industrial and Commercial Power Systems Department

n Wednesday, May 10,1995 at the awards luncheon of the Industrial and Commercial Power Systems Department in San Antonio, TX, IAS President Barry Brusso presented a plaque to the Department commemorating the 50th Anniversary of the publication of a document which today is known as the "Red Book". Shown in the photograph is Lynn Saunders, Power Systems Engineering Committee, accepting the plaque from President Brusso with Department Chairman Dave Baker looking on. Under the guidance of Don Beeman, the first edition, known as "Electric Power Distribution for Industrial Plants," was printed and sold for \$1.00 a copy. This award ceremony set the tone for my thoughts regarding the history of the Department. History to me is merely the accounting of persons and events of the past. There is not enough space here to list all of those who have made leadership contributions, but let me highlight those persons and events which are significant in the life of the Department.

The roots of the Department go back to the time when it was the *Industrial Power Applications Committee* of the AIEE. In the mid 60's when the AIEE became the IEEE it remained a technical committee within the IGA Group, later becoming the IAS. Leadership during this time was provided by individuals such as Don Brereton, Warren Cook, Roy Comstock, Cal Boice, Bernie Whittington and Tom Higgins. In 1977 the Committee became the I&CPS Department with George Walsh as its first chairman; other chairmen are listed on page 11. The Rural Electric Power Committee became a member of the department in 1990. Today the department continues its heritage of excellence in the dissemination of both theory and application information on industrial, commercial and rural distribution systems.

The need to document the application techniques of industrial power distribution continued after the successful introduction of the Red Book. Recognizing the need to develop specific subjects in greater detail, the *Green Book* on Power System Grounding was first published in 1956, and then the *Gray Book* on Commercial Building Power Systems in 1961. These were followed by the *Buff Book* on Protection and Coordination in 1975, the *Brown Book* on Power System Analysis in 1980 and the *Orange Book* on Emergency and Standby Power Systems in 1980.

These were followed by the *Gold Book* on Power System Reliability in 1980, the *Bronze Book* on Energy Conservation in 1984, the *White Book* on Health Care Facilities in 1986, and the newest to join this rainbow of application technology is the *Emerald Book* on Powering and Grounding Sensitive Electronic Equipment, published in 1992. Currently, there are three additional color books being written.

In the mid 1970's, following the passage of OSHA by Congress, Bernie Whittington, Warren Cook, Bob West and several others were interested in IEEE having a voice in consensus standards for power systems over 600 Volts. Their determination in the pursuit of this goal culminated in IEEE representation on Code Making Panels for the 1975 edition of the National Electrical Code. For the very first time the IEEE was represented with principals on 10 of the 22 panels. Today there are IEEE principals and alternates on all but one of the 20 panels.

Dissemination of technology through the presentation of technical papers has long been a primary objective of the Department, and remains so today. Equally important is the ongoing efforts to continually update the "rainbow of application technology" publications which requires the energy and dedication of many talented persons. These activities keep the I&CPS Department on the "cutting edge" of technology.



Left to right: Lynn F. Saunders, PSE Comm., Barry C. Brusso, President IAS, David S. Baker, Chairman I&CPS. Event: Presentation of 50th Anniversary Plaque commorating the publication of the "Red Book". I&CPS Technical Conference, San Antonio, TX 1995.

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# History of the Industrial Power Conversion Systems Department

Ira J. Pitel, IEEE Senior Member Chairman, Industrial Power Conversion Systems Department

The Industrial Power Conversion Systems Department is composed of four committees: Electric Machines, Industrial Drives, Industrial Power Converter, and Power Electronics Devices and Components. All committees are involved with the conversion of power from one form to another and have interests in a multitude of technologies. The committees have active programs to develop standards, develop interesting and timely educational seminars, promote technical exchange within the international community, and encourage balance between academic and industrial professionals.

The Electric Machines Committee interests focus on electrical machines for industrial applications. They are involved with the design and analysis of induction, permanent magnet, synchronous, switched reluctance, dc, and piezoelectric motors and generators. Other areas of interest include micro machines, solenoids, actuators, and electromagnetic sensors. The Electric Machines Committee deals with performance from nontraditional power sources, drives issues, control issues, and safety issues.

The Industrial Drives Committee is concerned with the interface between the motor and the utility. The committee is interested in drive applications, cost and reliability issues, efficiency issues, system compatibility, and power quality. From a power viewpoint, the committee is involved with novel power converter topologies and machine geometries for industrial, vehicle, and servo drives. On the control side, there is interest in drive control concepts, fuzzy logic, neural networks, performance optimization, adaptive drive control, and high performance servo drives. Software interests include drive software design, algorithms, software stability, and computational issues.

The Industrial Power Converter Committee is primarily concerned with the field of converting electrical power from one form to another; this includes ac to dc, dc to ac, ac to ac, and dc to dc. Circuitry falls into the classes of rectifiers, inverters, frequency changers, dc to dc converters, motor drives, uninterruptable power supplies, switching power supplies, induction heating systems, and active filters. Techniques for using new or existing power devices, snubbers, gate drive and device protection, modulation and control strategies are also of interest.

The Power Electronic Devices and Components Committee is involved with the devices, components, and materials for power processing. They are interested in the design and characteristics of semiconductor devices such as SCR's, GTO's, reverse conducting thyristors, MOS controlled thyristors, IGBT's, TRIACS, bipolar and darlington transistors, power FET's, and combination devices such as BIMOS. They are also interested in passive devices such as capacitors, resistors, fuses, inductors, ferrite cores, and metal-oxide varistors. Still further areas include hybrid drives and device protection systems, hybrid high-voltage integrated devices, and smart power devices.

The Industrial Power Conversion Systems Department is on a highly evolving technology base. A new semiconductor switch can reduce losses, change packaging requirements,



Figure 1-100 kW Inverter

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stimulate development of new circuits topologies, create new applications, and define new markets for other components.

Every component, every circuit, and every machine is tied to this explosion of technology. Applications are expanding daily. Figure 1 shows a 100 kW, low frequency inverter to enhance the flow rate of heavy oil - a technology made practical with highpowered IGBT devices and high density heat sinks.

Machines such as synchronous motors have seen dramatic change in recent years. Inverter-driven synchronous motors such as brushless dc, permanent magnet synchronous, and synchronous reluctance motors are increasingly used in new applications such as computer disk drives, small fans, and home applications. Figure 2 shows just a sample of some of the new designs.



(a) PM Synchronous

(b) Reluctance

Figure 2-Structure of Three Inverter-Driven Sychronous Motors

#### SOCIETY STAFF DEPARTMENT CHAIRMEN

#### ADMINISTRATION DEPARTMENT CHAIRMEN

1965-1966	Thomas M. Linville	
1966-1968	Eugene W. Boehne	
1968-1970	Marco H. Sluis	
1971-1973	F. A. (Tony) Furfari	
1974-1975	H. Paul Meisel	
1976	Bernard W. Whittington	
1977	James H. Beall	
1978	Carl A. Napor	
1979-1980	John H. Karlson	
1981-1982	John F. Blumenfeld	
1983-1984	Randolph L. Houlton	
1985-1986	Eugene J. Fagan	
1987-1990	C. L. (Curt) Ivey	
1991-1993	William W. Weil	
1994-1995	Paolo Tenti	

#### CHAPTERS DEPARTMENT CHAIRMEN

1968-1969	W. R. (Joe) Harris
1969-1971	George W. Younkin
1972	John F. Cachat
1973-1974	John A. Hart
1975-1976	A. Malcolm Curry
1977-1978	John C. Ponstingl
1979-1980	Howard I. Hoffman
1981-1982	Robert B. Voller
1983-1984	John F. Blumenfeld
1985-1986	Michael J. Foley
1987-1988	Beth M. Pack
1988-1989	Tom E. Kirsch
1990-1992	Barry C. Brusso
1993-1994	Wayne L. Quayle
1995-To Date	Caio A Ferreira

#### EDUCATION DEPARTMENT CHAIRMAN

#### 1995-To Date

#### R. Mark Nelms

#### MEETINGS DEPARTMENT CHAIRMEN

1977-1965	George E. Schall
1965-1968	Harold G. Frostick
1969-1970	Alfred F. Leatherman
1971-1975	B. C. (Bill) Biega
1976-1984	George U. Messner
1985	Richard P. Genda
1986-To Date	Melvin J. Dold

#### PUBLICATION DEPARTMENT CHAIRMEN

1965-1967	Don S. Brereton
1968-1969	Irvin N. Howell, Jr.
1970-1971	John F. Cachat
1972	James E. Levett
1973	Boris Mokrytzki
1974	William L. Wachs
1975	Edward A. E. Rich
1976	H. Paul Meisel
1977-1978	Dale B. Cochran
1979-1980	George W. Walsh
1981-1986	Vincent A. Falvo, Jr.
1987-To Date	Michael J. Foley

#### Society Transactions Editors

1965-1972	Don S. Brereton
1973-1974	Robert Loewe
1974-1983	Norman Peach
983-To Date	Edward A. E. Rich

#### Society Organization Manual and Membership Directory Editors

1967-1970	Don S. Brereton
1971-1982	Don S. Brereton and
	Patricia E. Brooks
1983-To Date	Don S. Brereton

#### Society Newsletter Editors

Don S. Brereton
Gerald C. Quinn
Ed Palko
Phyllis Beall
James H. Beall and Phyllis Beal
Patricia E. Brooks
F. A. (Tony) Furfari

#### **IEEE Industry Applications Magazine Editor**

1995-To Date John H. Kassebaum

#### STANDARDS DEPARTMENT CHAIRMEN

 1977–1979
 Brenard W. Whittington

 1980–1982
 Leonard S. Corey

 1983–1985
 L. A. (Pete) Morley

 1986–1989
 L. Bruce McClung

 1990–1993
 Ben C. Johnson

 1994–To Date
 L. Bruce McClung

# ADMINISTRATION DEPARTMENT

# History of the Administration Department

Paolo Tenti, IEEE Senior Member Chairman, Administration Department

The Administration Department was one of the three Staff Departments (along with the Meetings Department and the Publications Department) when the IEEE Industry and General Applications Group was formed in 1965. This Department originally consisted of five committees which were: Chapters, Education, Membership, Publicity and Recognition. The first Department Chairman was Thomas M. Linville. He was unusually knowledgeable being an IEEE Fellow, a senior manager at the GE Research and Development Center, and a Past President of the National Society of Professional Engineers (USA).

In 1968 the Chapters Committee of the Administration Department became the Chapters Department. In 1971 the Recognition Committee was renamed the Awards and Recognition Committee. A Fellows Committee was added to the Department in 1973. In 1982 the Publicity Committee was dropped and a Historian was added, and in 1983 the Historian became the History Committee.

The five-committee organization of the Department continued until 1987 when the Society Outstanding Achievement Award and the Awards Search Committee were added. In 1988 the Zucker Grant Committee was added, but the Awards Search Committee was dropped in 1989. The Distinguished Service Award Committee was added in 1991.

In 1994 two of the Society Standing Committees were transferred to the Administration Department; they were the Energy Committee and the Professional Activities Committee.

In 1995 the Education Committee became a separate Staff

Department, and the Zucker Grant Committee was then assigned to the new Education Department.

In 1996 a major change in the Administration Department is planned. Since so many of the committees of the Department are associated with awards, it is the plan of the Society Executive Board to create an Awards Department. The committees in this new Staff Department will be the: Fellows Review Committee, Society Outstanding Achievement Award Committee, Society Distinguished Service Award Committee, Society Outstanding Young Member Award Committee and the Awards Nomination Committee. (This proposal was announced in the July/August 1995 issue of the IEEE Industry Applications Magazine.)

The major change of establishing the Awards Department in 1996 has resulted in a plan to "retire" the Administration Department and to assign the remaining committees to other functions. The plan is to have the Membership Committee become a part of the Chapters Department and the History Committee become a part of the Publications Department. The two remaining functions, the Energy Committee and the Professional Activities Committee, will report to the Society Past President in that they are primarily a "liaison" function and not a "technical" function.

The Administration Department has given noble service to the Society for the past thirty-one years. Our thanks to all of those who have given great and dedicated service to this Department.

TRADUCTIONAL SYSTEMS



INSTITUTE

# History of the Chapters Department

Caio A. Ferreira, IEEE Senior Member Chairman, Chapters Department

Chapter'

This article covers the following topics: Past Department Chairmen, Distinguished Lecturer program, Chapters Awards and a chart showing the number of Chapters established from 1964 to 1995.

The Chapters Department Chairmen from 1968 to 1995 are listed below:

1968-1969	W. R. (Joe) Harris
1969-1971	George W. Younkin
1972	John F. Cachat
1973-1974	John A. Hart
1975-1976	A. Malcolm Curry
1977-1978	John C. Ponstingl
1979-1980	Howard I. Hoffman
1981-1982	Robert B. Voller
1983-1984	John F. Blumenfeld
1985-1986	Michael J. Foley
1987-1988	Beth M. Pack
1988-1989	Tom E. Kirsch
1990-1992	Barry C. Brusso
1993-1994	Wayne L. Quayle
1995-To date	Caio A. Ferreira

The IAS Distinguished Lecturer Program was first announced at the 1987 Annual Meeting in Atlanta. The following is a listing of the lecturers and their respective topics:

CHAPTERS DEPARTMENT

- 1987-? Daniel J. Love, "Reliable Industrial Power Systems."
- 1987–? William McMuray, "Power Electronics Circuit Topologies."
- 1987–? Ray P. Stratford, "Harmonics in Power Systems."
  1992–1993 Thomas A. Lipo, "Adjustable Speed Drives—The Next Generation."
- 1992–1993 Lloyd A. (Pete) Morley, "Mine Power Systems & Protection, Electrical Safety, and Shock Prevention."
- 1992–1993 Ion I. Inculet, "Electrostatic Processes and Their Applications."
- 1992–1993 Michel E. Poloujadoff, "Synthesis of Electric Machines — A Key to Their Optimization."
- 1992-1993 Koji Imai, "Power Electronics in Innovation Age."
- 1994–1995 Thomas H. Barton, "AC Variable Speed Drives."
- 1994–1995 Bimal K. Bose, "Power Converters and AFAC Drives."
- 1994–1995 Thomas M. Jahns, "AC Adjustable Speed Drives."
- 1994–1995 Donald W. Novotny, "Electrical Machines in a Changing Environment."
- 1994–1995 M. Ramamoorty, "New Trends in Compensation Techniques for Power Systems."
- 1994-1995 William Shepherd, "What shall we do when the oil runs out."

The Department records show the following Chapters as recipients of the IAS Outstanding Chapter Awards:

 1981 Seattle Chapter, "Outstanding Large Chapter" New York & Long Island Chapter, "Outstanding Large Joint Chapter" Toledo Chapter, "Outstanding Small Joint Chapter" Delaware Bay Chapter, "Outstanding Small Joint

- 1982 Washington D.C. Chapter, "Outstanding Large Chapter" Chicago Chapter, "Outstanding Large Joint Chapter" Birmingham Chapter, "Outstanding Small Chapter" Dayton Chapter, "Outstanding Small Joint Chapter"
- 1983 San Francisco Chapter, "Outstanding Large Chapter" New York & Long Island Chapter, "Outstanding Large Joint Chapter" Los Angeles Chapter, "Outstanding Small Chapter" Syracuse Chapter, "Outstanding Small Joint Chapter"
- 1984 Milwaukee and San Francisco Chapters, "Outstanding Large Chapter" New York & Long Island Chapter, "Outstanding Large Joint Chapter" Los Angeles Chapter, "Outstanding Small Chapter"
- Maine Chapter, "Outstanding Small Joint Chapter" 1985 San Francisco Chapter, "Outstanding Large Chapter"
- New York & Long Island Chapter, "Outstanding Large Chapter" New York & Long Island Chapter, "Outstanding Large Joint Chapter" Los Angeles Chapter, "Outstanding Small Chapter" Rochester Chapter, "Outstanding Small Joint Chapter"
- 1986 Baltimore Chapter, "Outstanding Large Chapter" Chicago Chapter, "Outstanding Large Joint Chapter" Toledo Chapter, "Outstanding Small Chapter" Syracuse Chapter, "Outstanding Small Joint Chapter"
- 1987 New York & Long Island Chapter, "Continued Outstanding Performance" San Francisco Chapter, "Outstanding Large Chapter" Orange County Chapter, "Outstanding Large Joint Chapter" San Fernando Valley Chapter, "Outstanding Small Chapter" Syracuse Chapter, "Outstanding Small Joint Chapter"

1988 New York & Long Island, "Continued Outstanding Performance" San Francisco Chapter, "Outstanding Large Chapter"

Chicago Chapter, "Outstanding Large Joint Chapter" Los Angeles Chapter, "Outstanding Small Chapter" Orlando Chapter, "Outstanding Small Joint Chapter"

- 1990 Houston Chapter, "Outstanding Large Chapter" Montreal Chapter, "Outstanding Large Joint Chapter" Los Angeles Chapter, "Outstanding Small Chapter" Israel Chapter, "Outstanding Small Joint Chapter"
- 1991 Baltimore and Portland Chapters, "Outstanding Large Chapter" Orange County Chapter, "Outstanding Large Joint Chapter"

Sao Paulo Chapter, "Outstanding Small Chapter" Los Angeles Chapter, "Continued Outstanding Small Chapter"

1992 San Francisco Chapter, "Outstanding Large Chapter" Denver and Rochester Chapters, "Outstanding Large Joint Chapter" Orange County Chapter, "Continued Outstanding Large

Chapter"

Sao Paulo Chapter, "Continued Outstanding Small Chapter"

1993 Oakland East Bay and Seattle Chapters, "Outstanding Large Chapter" Rochester Chapter, "Outstanding Large Joint Chapter"

Rochester Chapter, "Outstanding Large Joint Chapter" Syracuse Chapter, "Continued Outstanding Large Joint Chapter" Rock River Valley Chapter, "Outstanding Small Chapter"

Spokane Chapter, "Outstanding Small Joint Chapter" 1994 San Francisco Chapter, "Outstanding Large Chapter"

994 San Francisco Chapter, "Outstanding Large Chapter" New York & Long Island Chapter, "Outstanding Large Joint Chapter"

Los Angeles Chapter, "Outstanding Small Chapter" Spokane Chapter, "Outstanding Small Joint Chapter" Florida West Coast Chapter, "Continued Outstanding Chapter"

Please refer to the attached chart showing the number of new Chapters from 1964 to 1995. The bottom line here is that the numbers of Chapters continue to grow.

Our thanks to Barry Brusso, Michael Foley, Tom Kirsch and Wayne Quayle for their assistance in preparing this report.

CHAPTERS DEPARTMENT



#### IAS CHAPTERS 1964-1995

CALENDAR YEAR

# History of the Education Department

R. Mark Nelms, IEEE Member Chairman, Education Department

The newest Staff Department in the IAS, established in 1995, is the Education Department. This department consists of three committees: the Student Activities Committee, the Continuing Education Committee, and the Myron Zucker Grant Committee. The latter two committees were moved from the Administration Department. From 1979 to 1994, the Student Activities Committee was a Standing Committee of the IAS.

The Student Activities Committee is responsible for the development and implementation of student-oriented programs. The most recent activity has been the annual Student Prize Paper Contest started in 1990. This contest has grown from three submissions in 1990 to twenty-two in 1995. Papers have been submitted by students in eight of the ten IEEE regions. The First, Second, and Third Place papers receive a cash prize. Originally, the cash prizes were \$300, \$200, and \$100; however, they have recently been increased to \$400, \$300, and \$200. In addition to the cash prizes, the authors of the First Place paper are reimbursed for travel expenses not to exceed \$1600 to attend the IAS Annual Meeting to receive their award. The First Place winners for the 1990 - 1994 contests are as follows:

1990: "A 68000-Based Multitasking Digital Electroplating Line Power Supply Controller"—Daniel Doughty and Mark Mackelprang, Arizona State University

1991: "Coupled Mode Analysis of Fiber Optic Arrays"-Janice Hudgings, Swarthmore College

1992: "Control System Design for an Optical Lens Generator"-Gregory B. Kittilson, St. Cloud State University

1993: "Signature Recognition Using Neural Networks"— Marc St-Onge and Robert Auld, Royal Military College of Canada

1994: "Tissue Characterization of Cardiac Muscle Using Ultrasound Imaging"—Amit Lahav, Harald Kiel, and Pramod Srivatsa, The Cooper Union for the Advancement of Science and Art

The Continuing Education Committee is responsible for conducting tutorials and other educational programs to promote the continued education of the IAS membership. Tutorials on topics of current interest to IAS members are presented at many IAS meetings.

Through a generous contribution by the late Mr. Myron Zucker, the Industry Applications Society established the

Myron Zucker Faculty Grant program in 1987. Mr. Zucker wished to foster student interest in engineering design as related to industry applications. The goal of the Myron Zucker Grant Committee is to develop programs to encourage engineering students and faculty to work together on industry applications projects. The original program provided a \$25,000 grant to a university for a professor and graduate student to work together on an industry applications problem. This program is currently being revised and a new awards program will be announced in the near future.



A1 Kiener and Mark Nelms attend the Awards reception with the 1993 Student Prize Paper Contest winners Robert Auld and Marc St-Onge from the Royal Military College of Canada.



Wayman Smith, Dr. Robert Stratton, Lisa Moses-Samsudin, and Dr. Marcus Durham discuss the 1989 Zucker Grant project.

# History of the Meetings Department

Melvin J. Dold, IEEE Senior Member Chairman, Meetings Department

he present IAS Meetings Department can trace its history to the very beginning (1965) of our Society when it was known as the IEEE Industry and General Applications Group. Mr. Robert B. Moore served as the first president of the organization and Mr. George E. Schall served as the first Meetings Department Chairman. Early members of the Meetings Department included John S. Ferguson, chairman of the first Annual Meeting held in Chicago in 1966, F. A. (Tony) Furfari, who served as chairman of the 1967 Annual Meeting in Pittsburgh; and B. C. (Bill) Biega, who was the Secretary of the 1966 Chicago meeting and served as the chairman of the 1968 Annual Meeting. Other Meetings Department Chairmen are listed on page 18.

The first Annual Meeting was held in Chicago in 1966 concurrently with the National Electronic Conference and offered 21 technical sessions supported by 14 different technical committees. The attendance at that first conference was almost 900 attendees. Last year's (1994) meeting was held in Denver, CO where we offered 60 technical sessions supported by 14 technical committees with 935 attendees. The Silver Anniversary (25th) meeting was held in 1990 at Seattle, WA. That milestone was celebrated by a number of special events.

The long range plans for the first Meetings Department was

to have the Annual Meeting on even numbered years in Chicago in 1966 and elsewhere on the odd numbered years. This continued until 1972 when the Annual Meeting was held in Philadelphia. After that time the Annual Meetings were moved around in an effort to allow different host cities. This same procedure is still in effect today.

The function and operation of the present day Meetings Department is much the same as in years past. We act as advisors to Technical Conferences on questions concerning IEEE policies and procedures relating to meeting requirements while monitoring the flow of the necessary paperwork and forms. We review and approve the conference budgets, arrange for advance funding for the conference, and for a final financial report with appropriate audit.

In 1983 the IAS Annual meeting was held in Mexico City. That is the only time in our history that the annual meeting was held outside regions 1-7 (U.S. and Canada). However with the current large membership outside North America, the IAS Executive Board is encouraging more IAS sponsored conferences, including the annual meeting, to be held in other regions. Some important progress has been made in this regard but much more is still to be done.

#### Society Annual Meeting Past and Present Chairmen

1966 Chicago, IL 1967 Pittsburgh, PA 1968 Chicago, IL 1969 Detroit, MI 1970 Chicago, IL 1971 Cleveland, OH 1972 Philadelphia, PA 1973 Milwaukee, WI 1974 Pittsburgh, PA 1975 Atlanta, GA 1976 Chicago, IL 1977 Los Angeles, CA 1978 Toronto, ON, Canada 1979 Cleveland, OH 1980 Cincinnati, OH

John S. Ferguson F. A. (Tony) Furfari B. C. (Bill) Biega Myron Zucker James E. Levett William S. Watkins John A. Herrmann H. Paul Meisel Robert N. Wagner Lawrence J. Acker Glenn R. Griffith Arthur V. Vieweg W. Harry Prevey Thomas E. Senney William L. Wachs

1981 Philadelphia, PA 1982 San Francisco, CA 1983 Mexico City, Mexico 1984 Chicago, IL 1985 Toronto, ON, Canada 1986 Denver, CO 1987 Atlanta, GA 1988 Pittsburgh, PA 1989 San Diego, CA 1990 Seattle, WA 1991 Dearborn, MI 1992 Houston, TX 1993 Toronto, ON, Canada 1994 Denver, CO 1995 Lake Buena Vista, FL Samuel P. Axe Edward J. (Ted) Bubb Eduardo Hoyo Monroy Wayne L. Moser Ajit Bapat H. Paul Meisel Richard M. Johnson Charles E. Gray Farrokh Shokooh Richard W. Becker William J. Moylan John G. Anderson Aiit Bapat H. Paul Meisel Edward A. Lobnitz

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# PUBLICATIONS DEPARTMENT

# History of the Publications Department

Michael J. Foley, IEEE Senior Member Chairman, Publications Department

The mission of the Publications Department is to manage and administer publications of the IAS; provide technically accurate reference papers; timely and accurate technical articles; communicate Society and relevant IEEE information to all IAS members and to coordinate other IEEE publications that are within the scope of the IAS. Currently the mission is accomplished through publication of the *IEEE Transactions on Industry Applications*, the *IEEE Industry Applications Magazine*, the *IAS Organizational Manual and Membership Directory* and IAS sponsored IEEE Press books, respectively. The creation and growth of these publications mirrors how the IAS, and its predecessor, the IGA Group, has grown since its inception in 1965.

To date, the Publications Department has had 12 chairmen, including six IAS past presidents. Don Brereton, editor of this history update publication, was the founding department chairman and *Transactions* editor. A listing of all chairmen can be found on page 18 of this publication.

The first issue of the IAS *Transactions* contained ten papers within its 88 pages. In 1965, 444 pages were published. Compare that, 30 years later, with a 1994 *Transactions* issue containing 24 papers and 217 pages, with a total of 1656 pages published that year. As the Society has grown, so too has its flagship publication *Transactions*. There have been four *Transactions* editors over the 30 years (see page 18 for a complete list). Edward A. E. "Ted" Rich has been *Transactions* editor for the past 12 years and has orchestrated the review and publication of thousands of technical papers. Any *Transactions* author that has published a paper knows that Ted will do his best to ensure the paper is reviewed, handled and published on time. Ted is also the editor for the IAS *Authors Guide*, a publication to inform authors of the requirements to publish in the *Transactions* and *Magazine*.

For 28 years the *IAS Newsletter* kept IAS members informed of activities and provided information and commentary of interest. F. A. "Tony" Fufari was editor for 10 years, until the *Newsletter* ceased publication and the *Magazine* was published in January, 1995 (see page 18 for a list of editors). It was with Tony's guiding hand that the *Newsletter* was transformed into *the* model IEEE newsletter and ultimately the *Magazine*. Tony's commentary can still be found within the pages of each *Magazine* issue.

The creation of the *Magazine* was first formally considered by the Society Executive Board in 1987. In 1993 a committee was formed to develop a plan, seek IEEE and Executive Board approval, and publish the *Magazine*. With M. Dayne Aldridge, past president, as the chairman of the *Magazine* Editorial Board, plans were developed, approvals received, John Kassebaum selected as editor, and the *Magazine* inaugural issue published in January, 1995. The *Magazine* contains technical articles that are peer reviewed, perhaps presented at a conference, are of interest to a broad group of IAS members and, of course, are application-based. Everyone in the Publications Department and members of the *Magazine* Editorial Board are excited about John Kassebaum's plans for the *Magazine* and are confident that the *Magazine* has enhanced the value of being an IAS member.

In addition to the *Transactions* and the *Magazine*, every IAS member receives the *Organizational Manual and Membership Directory*. Don Brereton has been the *Manual* editor since the *Manual* began in 1967. The *Manual* was part of the first issue of the *Transactions* each year, until 1983, when it became a separate publication. The *Manual* has been a vital reference for all members, especially those on committees, officers of departments and the Executive Board.

IEEE Press publishes books that are of interest to the technical community. IAS has sponsored or co-sponsored five books since 1986. Geza Joos, IEEE Press Liaison, reviews proposals and oversees the review of manuscripts for IAS sponsored books. The Society achieves a broad exposure through IEEE Press publications.

Technical publications available from the Society are consistently listed in member surveys as a highly valued benefit of IAS membership. Your Society's Publications Department volunteer members and IEEE staff members, will continue to work to improve IAS publications for you, the IAS member.



IEEE Industry Applie to see the second secon

Author's Guide



Organization Manual & Membership Directory 1967 – To Date



IEEE Industry Applications Magazine 1995 – To Date



**Conference Record** 

# History of Standards Department

L. Bruce McClung, IEEE Fellow Chairman, Standards Department

The IAS Standards Department is a relatively young Society Staff Department. There have only been five IAS Standards Department Chairmen.

Bernard W. Whittington was the first and his term was 1977 to 1979.

Leonard S. Corey was the second and his term was 1980 to 1982.

L. A. "Pete" Morley was the third and his term was 1983 to 1985.

L. Bruce McClung was the fourth and now the sixth and his terms were 1986 to 1989 and 1994 to Present. Ben C. Johnson was the fifth and his term was 1990 to 1993.

Codes and Standards work in the early Industry and General Applications Group (IGA which was formed in 1965) was focused under the Industrial and Commercial Power Systems Department. Little is recorded until 1971 when William N. Zippler was Chairman of Group Standards. During this period, because of the impending effective date of the new Occupational Safety and Health Administration (OSHA) statutes that would cause large US industry to conform to the 1971 National Electrical Code (NEC), considerable activity occurred in the I&CPS Codes and Standards Subcommittee under the chairmanship of Eugene R. Smith of Quaker Oats. Large industry (particularly the continuous process petrochemical industry), began to realize the substantial negative impact that adherence to the residential and commercial aspects of the NEC would cause, and recognized the need to be represented and to participate in national consensus standards with which they would have to comply. Bernard W. Whittington, Ralph H. Lee and Robert B. West, all employees of large chemical companies, were instrumental in developing strategy to make compatible the enforcement of a predominantly residential and commercial code on heavy industry. This strategy became the major objective of I&CPS Codes and Standards Subcommittee. Robert V. Wachter, who became Chairman of IAS Standards Committee at this time, continued to support the effort. In 1972 Donald S. Brereton, Constitution and Bylaws Committee Chairman, note the objectives for IAS Standards as "accomplishment of getting representatives on National Fire Protection Association (NFPA) and on American National Standards Institute (ANSI), formalizing of procedures and paper flow for society generated standards and establishment of a liaison position between IAS Standards Committee and the IEEE Standards Board".

This strategy for changing the document(s) by which heavy industry electrical systems safety would be measured had two

fundamental segments. One was to document existing safety records and procedures used by the heavy industry companies and present that information in formal administrative hearings to the US Department of Labor in Washington, DC. The second was to get heavy industry user representatives on all pertinent national consensus standards (National Fire Protection Association's NEC and American National Standards Institute's National Electrical Safety Code). Representatives participating in national consensus standards must have a base group that can be identified as providing a directed vote for issues that come before the codes and standards making bodies. Accordingly Standards Coordinating Committee (SCC) #18 was organized with W. R. "Bill" Kruesi as Chairman. This group finally placed representatives on all 20 NEC Code Making Panels in 1973. In 1974 Dale R. Cochran replaced Bob Wachter as Chairman of IAS Standards Committee. The 1975 NEC was the first edition issued after IEEE representatives began a concerted effort to include such exceptions as follows: "In industrial establishments only, where conditions of maintenance and supervision assure that only qualified persons will service the equipment or systems". Also in 1975 NFPA began rewriting the NEC for OSHA's use as a consensus document by which to monitor and inspect "Electrical Safety For The Employee Workplace" which was issued in 1988. Again in 1991 NFPA undertook major revision of NFPA 70E "Electrical Safety For The Employee Workplace" which was issued in 1995. The National Electrical Safety Code ANSI C2 is the other electrical safety document of importance to IAS members. Representatives from IAS Standards Department ANSI Activities participate in this standard.

In 1977 the IAS Standards Department had its official beginning. Bernard W. Whittington was the Chairman and remained so through 1979. Six subcommittees were established under the IAS Standards Department. These subcommittees and their Chairmen were: ANSI Activities (L. F. Stringer); NEC Nominations (Warren Cook); Mining Safety (L. A. Morley); Safety (Harold Rice); Standards Awards (Irvin Howell); and Standards Projects (Bill Neiswender). In addition to Bill Kruesi and Warren Cook, Robert L. Simpson has been and is the present NEC Nominations Chairman.

During the 1980's an inward expansion of standards by IAS codes and standards making groups resulted in the popular "color book" series. The "color books" now include:

Red Book	IEEE 141-1993
Green Book	IEEE 142-1991
Gray Book	IEEE 241-1990
Buff Book	IEEE 242-1986
Brown Book	IEEE 399-1990

Orange Book	IEEE 446-1987
Gold Book	IEEE 493-1990
White Book	IEEE 602-1986
Bronze Book	IEEE 739-1984
Emerald Book	IEEE 1100-1992

From 1985-1986 the IAS Standards Department began to migrate from an inward focus for the benefit of IAS standards promulgation to an outward focus for coordination with all the other IEEE "Societies" that were also developing standards with an impact on IAS members. From 1986 to the present, in addition to the IAS Standards Department Chairmen, IAS has also placed Don Michaels, Don Zipse, Jim Daly, Jim Beale, and now Al Kiener on the IEEE Standards Board. Al Kiener has the distinction of being the Vice President of Standards for the IEEE in 1995. In 1990 so much coordination with all IEEE standards making groups was underway that IAS set up the IAS Standards Coordinating Committee under the IAS Standards Department. Specifically this group attempts to provide and seek liaison with the standards making efforts of all the IAS Committees. This is still in effect resulting in eight committees under the IAS Standards Department at present. These are: Standards Coordinating/Liaison (Bob Deaton); NEC Nominations (Bob Simpson); Standards Awards (Bernard Whittington); ANSI Activities (Michael Foley); Safety (John Gallagher); Marine Transportation (Rocco Lofaro); Mining Safety (Kenneth Sacks); and Glass Industry (James Joseph).

IAS Standards Medallions have been awarded to the following individuals:

Donald T. Michael	1974
Bernard W. Whittington	1975
Daniel L. Goldberg	1975
John A. Hart	1975
Norman Peach	1976
Derio Dalasta	1976
Donald S. Brereton	1977
Richard Harold Kaufmann	1977
William A. Weddendorf	1978
William J. Neiswender	1979
Leonard S. Corey	1980
Donald W. McWilliams	1981

Richard H. McFadden 1	981
Charles R. Heising 1	981
Warren H. Cook 1	981
Thomas E. Sparling 1	982
Leonard J. Kelley 1	983
Robert C. Mierendorf 1	984
Carl E. Becker 1	985
Hugh O. Nash 1	986
Pat O'Donnell 1	987
Jerome M. Frank 1	987
John R. Cooper 1	987
Lucas G. Ananian 19	987
Robert L. Simpson 19	988
James Beall 1	989
L. Bruce McClung 19	990
Donald W. Zipse 19	991
M. Shan Griffith 19	991
Neil Nichols 19	992
Milton D. Robinson 19	993
William J. Moylan 19	994
James M. Daly 19	995

IAS members that have received the Charles Proteus Steinmetz award for support of the IEEE Standards are:

1984	H. Baron Whitake	
1990	Warren H. Cook	
1995	L. Bruce McClung	

Just as the IAS changed from an inward IAS to an outward IEEE focus in 1985–1986 the IAS like all IEEE is now looking globally to make input on codes and standards which eventually, as a result of GATT and NAFTA, will effect industrial and commercial users of electrical equipment and systems. At present the Ad Hoc Committee on IAS Participation in International Standards Activity is composed of: Bernard Whittington, Baldwin Bridger, John Cooper, Tony Furfari, Tom Lipo, and Bruce McClung. They have the charge of exploring and evaluating the concept of IAS participation in the development of International Standards covering electrical equipment and installations; specifically those IEC/ISO standards that traditionally and currently are associated with IAS.

### Past IAS Annual Meetings

A collection of snap shots culled from the file.



The first Annual Meeting was held in 1966 in Chicago. Site of the second Annual Meeting, 1967, was the Pittsburgh Hilton with F. A. (Tony) Furfari as the General Chairman.



In 1967, a time-sharing computer was used to track conference registration, compliments of the General Electric Company.

1974



Seven years later, 1974, the Annual Meeting is again in Pittsburgh; Robert Wagner, Executive Vice President of ALCOA, was the General Chairman, and the conference was held at the grand old William Penn Hotel. B. C. 'Bill' Biega, left, is with H. Paul Meisel. Bill was Meetings Department Chairman, and Paul was General Chairman of the 1973 Annual Meeting held in Milwaukee. At the center, background, is John Hart, Chapters Department Chairman.



Prior to 1970, The Industry Applications Society was called the IEEE Industry and General Applications Group.



Visual aids were in common usage at the 1967 meeting and even included  $3 1/4 \times 4$  lantern slides. Here are shown both the 2 x 2 projector with carousel, and a Lantern Slide Projector; the latter is now found only in museums.



1974: Center and left are John F. Cachat, 1975 Society President, and John Guyeska, 1975 Society Treasurer.



In 1984, the Meeting was back at the Palmer House in Chicago. Richard S. Nichols was Society President that year.



A group of distinguished contributors to the IAS activity are at dinner. (I to r), Harry Frostick, 1970 Society President; Ann Burgmeyer, IEEE Publishing; George Younkin, 1974 Society President; Clara Kiener (Mrs. E. G. (Al) Kiener); Mary Ann Cachat, John Cachat, Gerald Quinn, former IAS Newsletter Editor; and E. A. E. (Ted Rich), Transactions Editor.



General Chairman of the Annual Meeting was Wayne Moser, center, shown with Russell W. Mills and Mrs. Mills. Mr. Mills was presented with the IAS Outstanding Achievement Award.



The Annual Meeting became an international affair in 1978, when, for the first time, it was held outside the U.S., in Toronto, Ontario, Canada, at the Royal York Hotel. In 1983 it was in Mexico City. In 1985 the meeting returned to Toronto at the Royal York Hotel...

PAST SOCIETY ANNUAL MEETINGS



... and shown here is an international flavor: Newsletter Editor F. A. (Tony) Furfari, with conference attendees from Italy; (I to r), Paolo Tenti, Univ. of Padova, Alfo Consoli, Univ. of Catania, Tony Furfari, and Luigi Malesani, Univ. of Padova.



The 1987 Annual Meeting was at the Hyatt Regency Hotel, in Atlanta Georgia. A highlight of that conference was when Society President Robert Voller and IAS member Myron Zucker announced establishment of the Myron Zucker Student-Faculty Grant Program. Mr. Zucker endowed the Program for the purpose of encouraging electrical engineering students to enter the industry applications aspects of the profession.

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The 1988 meeting was again in Pittsburgh. The Society President that year was Lloyd A. (Pete) Morley, seen second from right, in this assembly of authors.



A group of international authors.



A Panel Session, typical of those which have been regular features of every Annual Meeting.



The Society President, assisted by Executive Board members and their spouses have always hosted receptions to meet and honor award recipients before the luncheons and banquets where the awards are presented. Here (I to r) Society Secretary Linos Jacovides, Clara Kiener, Nancy Aldridge, and Dayne Aldridge, Chairman of the Process Industries Department.



In 1989 the Annual Meeting was at the Del Coronado in San Diego, California.



The 1989 Conference committee, with Farrokh Shokooh, General Chairman, at the far right.



Charles Gray, General Chairman of the 1988 meeting, Farrokh Shokooh, and Baldwin Bridger, 1989 Society Treasurer, (probably discussing conference finances).



Jeannette Pierce was given a special hand for contributions to every aspect of the Annual Meeting. A special highlight of this conference was an evening at the Henry Ford Museum, in Dearborn, where guests toured the museum, then enjoyed a buffet dinner.



Manufacturers sponsor activities and other support that is very much appreciated by the conference committee and attendees of the Annual Meetings.



The 1991 Annual Meeting was held in Dearborn, Michigan; Bill Moylan was General Chairman. Here, Ronald M. Jackson, Society President, presents recognition mementos, IEEE scarfs, to two of Chairman Moylan's aides, Andrea Ketten and Jeannette Pierce, for their leadership roles in planning and staging the conference.



The President's Banquet and Dinner Dance was a ritzy affair with elegant service, at the Ritz-Carlton Hotel.



The 1994 Annual Meeting was at the Denver (Colorado) Tech Center in the Sheraton Hotel. IEEE President Troy Nagel attended the President's Banquet, reported on IEEE matters, and then presented certificates to new Fellows, and the 1994 IEEE Richard Harold Kaufmann Technical Field Award to Daniel Love.



Ladies at the reception for award recipients; (I to r) Valerie Nichols, Olga Furfari, and Nina Beall.



The conference featured casual wear . . . (Dick Nichols and Mike Foley)



... and classy music.



Each year Past Society Presidents attending the Meeting are assembled for a photograph. In 1994 they assembled around IEEE President Troy Nagle for the photograph. Front row, (I to r): James Cooney 1968, Donald Brereton 1969, F. A. (Tony) Furfari 1976, IEEE President Troy Nagle, E. A. E. (Ted) Rich 1978, Paul Meisel 1979, and James Beall 1980. Back row, (I to r): Bernard Whittington 1982, Richard Nichols 1984 and 1985, E. G. (Al) Kiener 1986, Robert Voller 1987, Eugene Fagan 1989, Dayne Aldridge 1992, Baldwin Bridger 1993, and Thomas Lipo 1994.

# IAS HISTORY - PART

# GUEST FEATURE

REPRINT FROM THE IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS. VOL. 1A-20, NO. 4, JULY/AUGUST 1984

### The IEEE Industry Applications Society

An Organization Striving to Constantly Improve Its Service to Its Membership Donald S. Brereton, Fellow, IEEE 1969 Society President 1977–1980 Member of IEEE Board of Directors

#### PREFACE

It has been a special experience to have been requested by our Society President and our TRANSACTIONS Editor to prepare this Guest Feature that provides historical information about the Society, comments on organization changes, and reflections on the activities of the Society.

#### INDUSTRY AND GENERAL APPLICATIONS GROUP

The present organization of the IEEE Industry Applications Society came about principally because of combining various residual components when the American Institute of Electrical Engineers (AIEE) and the Institute of Radio Engineers (IRE) came together to form the Institute of Electrical and Electronics Engineers (IEEE) on January 1, 1963. As a historical note the AIEE was formed on May 13, 1884 in New York City, and the IRE was formed on May 13, 1912 also in New York City.

With the formation of the IEEE various Technical Committees from two of the six Divisions of AIEE were structured to become eventually what was first known as the IEEE Industry and General Applications Group (See Fig. 1). Although no Technical Committees were structured from the IRE, nevertheless this organization played an important part in the forming of the Industry and General Applications Group on January 1, 1965.

*Editorial Note:* Capital letters are used to augment the understanding of the historical development.

The AIEE structure was made up of Technical Committees formed into the following six divisions:

- 1) Communication Division
- 2) General Applications Division
- 3) Industry Division
- 4) Instrumentation Division
- 5) Power Division



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dministration Opportment lepartment Chairman	Charters Department Department Charman	Incl Dep	housel Overabene Devertment. eartment Cheirman		
OMMUTTEES	COMMITTEE	19	TECHINICAL COMMITTEES		
Education	Council Members at Large	Comant Industry	Marine Transportation		
		Corrosion and Cothodic Protoction	Mistal Industry		
empersivp		Dismestre Appliance	Mining Industry		
Publicity		Electric Process Heating	Petroleum and Chemical Industry		
		Electric Space Heating and Air Condition	tioning Power Semiconductor		
		Electric Weiding	Production and Application of Light		
		Electrostatic Processes	Pulp and Papar Industry		
		General Industry Applications	Rubbar and Plastics Industry		
Masteres Depertment	Publications Department	Industrial and Commercial Power Syst	terre Rural Electric		
COMUTTEES	COMMITTEES	Industinal Centrel	Statue Power Convertor		
Group	Transactions	Lond Transportation	Textile Industry		
Annual Maetings	Advesty Board	Mactune Tools industry			
IEEE International Convention	Transactions	GEN	ERAL COMMITTEES		
Technical Committee		IGA Group Safety Liaison	IGA Group Standards		



#### Science and Electronics Division.

The IRE had a "Group" organization structure that formed the various Technical Committees into a technology category, called a Group. This structure had an important feature by organizing Group Chapters at the local member service organization, the Section.

There were many parallel Technical Committees between the AIEE and IRE organizations at the time of the merger in 1963. Much of the energy and attention of the Institutes's leadership was oriented to combine the two technical organizations in the most appropriate manner. The Industry and General Applications Group came out of combining the Technical Committees of the AIEE Industry Division and the AIEE General Applications Division that had no parallel Technical Committees as a part of the IRE. An intermediate organization was formed, between 1963 and 1965 known as the IEEE Industry and General Applications Division. It was felt that this organization did not need to fully adopt the Group organization approach quickly so it used this intermediate period to develop a more careful foundation to structure the new Group.

When the AIEE was formed into six Divisions, it adopted the pattern of publishing three TRANSACTIONS. They were Applications and Industry, Communication and Electronics, and Power Apparatus and Systems. When



Figure 2. In 1972 the IEEE IGA Group became the IEEE Industry Applications Society.

the Group structure came into being the pattern was accepted that each of the Groups would have its own TRANSACTIONS. This set the stage to expand the published Technical Papers of the Institute enormously and significantly improve the service to the membership by publishing more specialized and expanded versions of the different TRANSACTIONS. It was the judgement of the intermediate Administration Committee (AdCom) of the "IEEE Industry and General Applications Division" that it would be appropriate not to hurry the foundation of the future Industry and General Applications Group, but use the time to develop helpful procedures by which the new Group TRANSACTIONS would be implemented effectively and to further develop its operating procedures.

It was observed that some of the Groups that were quickly formed or combined had not been able to take the necessary time to carefully develop such operating documents as their "Constitution and Bylaws". As a result it was felt that it would be wise to call on the most experienced talent available to assist in forming and filling out the Constitution and Bylaws for the new Group. When IEEE was formed it was the decision of the Institute's Board of Directors to seek a new General Manager; Donald G. Fink, a Fellow of both the AIEE and IRE, was selected. The former AIEE and IRE General Managers (General Secretaries) were wisely retained on an Executive Consultant basis. This made possible the availability of former AIEE General Secretary Nelson S. Hibshman to assist in the writing of our Group's Constitution and Bylaws. The time taken in carefully preparing the new governing documents proved to be a constructive investment. While the procedures were being developed for the new TRANSACTIONS, and the new Constitution and Bylaws were being written, another important activity was underway-the formation of the Technical Operations Department (TOD). A splendid selection was made for the first Chairman of TOD, Willard H. (Bill) Dickinson. He and his Department Officers recognized that many of the Technical Committees had decades of experience and needed very little direction, but they did need support in processing the selection of Technical Papers into the new TRANS-ACTIONS, as well as support for their Technical Conferences. When the Group was formed in 1965 there were 22 Technical Committees and two coordinating committees. This IGA Group organization structure is shown in Fig. 1.

The organization structure of the Group was, of course, much simpler at the beginning. It consisted of the Group Chairman (now identified as the Society President), Vice Chairman, Secretary, Treasurer, and Past Chairman as Group Officers; Standing Committee Chairmen for the Nominating, Constitution and Bylaws, and Finance Committees; Department Chairmen for the Administration, Meetings, Publications and Technical Operations Departments; and four Members-at-large of Ad-Com.

At this point let me share with you how stimulating it was to be associated with the founding of the Group. The Group Officers requested me to serve as the Chairman of the Publications Department and Editor of the TRANSACTIONS. Irv Howell succeeded me as the Department Chairman in 1968 and Robert Loewe succeeded me as the Editor in 1973.



	Socrety Officers. Me Ci Facts Officers a	COLUNCIA mbero et Lange, Chepter Dategates, D mentas Cherman, Marta Annuatly I danakura et Lange, Astinka Gaestikusen An Estatisuka Maar Peter	operiment and headheats
	5	ADMINISTRATIVE COMMITTEE carly Officers. Mambers at Large. Standing Commission Charman, Department Charmon rem, Romanes Manaers at Large and Office Agencies Agencies	n,
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COMMITTEES Awards and Recognition	COMMNTTEES Council Members-st-Lorge		
Follows	Area Chairman	Cemant Industry	Corrosion and Cathodic Protection
former	Chaptor	Domestic Appliance Industry	Electric Precess Hasting
	Communications	General Industry Applications	Electric Space Heating and Air Conditioning
Nembership	Chapter Development	Glass Industry	Electrestatic Processes
Publicity	Chapters	Land Transportation	Industrial and Commorcial Pavar Systems
	Manusi	Machine Tools Industry	Industrial Control
	Student Branch Relations	Marine Transportation	Power Semiconductor
		Matal industry	Production and Application of Light
Mastures Department Department Chairman	Publications Department Department Chairman	Munung Industry	Slatic Power Converter
COMMITTEES	COMMITTEES	Petroleum and Chamical Industry	
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IEEE International	Transactures	Rubber and Plastics Industry	
Convention		Rural Clastine Power	
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LEEE INDUSTRY APPLICATIONS SOCIETY

Figure 3. In 1974 the Industry Operations Department and Technology Operations Department were structured.

#### INDUSTRY APPLICATIONS SOCIETY

During the later part of the 1960's several of the larger Groups associated with the Technical Activities Board (TAB) developed the desire to establish themselves more prominently both within the Institute and externally to other technical societies. As a result TAB formulated procedures by which a Group would qualify itself as an IEEE Society. (The title of the presiding officer would then change from Group Chairman to Society President.)

The Industry and General Applications Group desired to qualify for Society status, and the necessary application was made in 1971. Those preparing the proposal felt that the name should be shortened and that the identification of "Application" should be retained. The proposal was approved and the IGA Group became the IEEE Industry Applications Society as of January 1, 1972.

Another element of the 1971 study was to move the Technical Operations Department toward a greater representation on the Society's Administrative Committee (AdCom). This was done by dividing the 23 technical committees into a group of 14 Industry Committees and nine Technology Committees. Two TOD Vice Chairmen were added to AdCom to strengthen the Technical Committee representation. (See Fig. 2.)

The increased impact of a stronger technical representation proved to be very useful. As a result in 1974 the Technical Operations Department was divided into the Industry Operations Department and the Technology Operations Department. This increased the representation on AdCom to four in that a Department Chairman and Vice Chairman each represented these two Departments. (See Fig. 3.)

The success of the enhanced technical organization was further studied. It was felt that the administration and support of the technical committees could be further improved by structuring smaller Operating Departments. Therefore, in 1977 the two technical operating Departments were divided into five Operating Departments. Two of the Departments were oriented towards serving various industries: the Process Industries Department (with eight Technical Committees) and the General Industries Department (with seven Technical Committees)....and three Departments were oriented towards serving various system technologies: the Industrial Power Systems Department (with five Technical Committees), the Industrial Power Conversion Systems Department (with three Technical Committees), and the Industrial Utilization Systems Department (with five Technical Committees). (See Fig. 4.)

The current organization structure is very similar to that established in 1977. Some modifications were made in such components as the Standing Committees by developing a broader base of involvement with the addition of the Professional Activities Committee and the Student Activities Committee. An important new Technical Committee, the Robotics Industry Committee, has been added to the General Industries Department. The Industrial Power Systems Department modified its name to the identification of its former single Technical Committee to become the Industrial



Figure 4. The five Operating Departments were structured in 1977.

and Commercial Power Systems Department; it also modified the status of two of its Technical Committees. The five Staff Departments were continued with essentially the same organization structure. (See Fig. 5.)

#### MEMBERSHIP GROWTH

The solid growth characteristics of the Society can be illustrated by the statistical information from the Annual Report of the IEEE Secretary. The membership of the Society (as of December 31 of the year indicated) is listed in Table I.

#### SOCIETY ANNUAL MEETINGS

Many of the Technical Committees have been holding Annual Technical Conferences prior to the formation of the Industry and General Applications Group in 1965. One of the identified services that the Society has been able to do for the Technical Committees has been to support their various Committee or Department Technical Conferences as well as provide an annual opportunity for the Technical Committees to make use of the Society Annual Meeting. Starting one year after the Group was formed the past, present, an projected schedule of Society Annual Meetings is listed in Table II.

#### SOCIETY LEADERSHIP

Most certainly one's election to the office of Society President seems over-whelming at the time but, after the many years of preparation and the actual year of service as the Society President and on the Technical Activities Board, there is a feeling of accomplishment and satisfaction. Those that have served as our Group Chairman and Society President are listed in Table III.

It has been possible for a few of our former Society Presidents to be elected to the IEEE Board of Directors. They are identified in Table IV.

Many other past Society Presidents have served in different leadership assignments, such as George Bobart who is current Chairman of the Awards and Recognition Committee of the Technical Activities Board.

#### RECOGNITION BY THE SOCIETY

Five years after the Group was formed it was determined by the Administration Committee that a "Society Outstanding Achievement Award" should be established. The Award is to recognize and honor a person annually who has made meritorious contributions in a technical field within the scope of the Society. The contribution and service may be through invention, technical development, or through executive or management direction in professional and IEEE endeavors. The list of the recipients of the Society Outstanding Achievement Award from 1969–1984 are listed in Table V.

Мемве	TABLE I rship In The Society		
1965	2609		
1966	3578		
1967	4151		
1968	4151		
1060	5287		
1909	5794		
1970	6205		
1971	6623		
1972	6000		
1975	0900		
1974	7401		
1975	8251		
1970	8901		
1977	9467		
1978	10 020		
1979	10 /88		
1980	11 433		
1981	11 307		
1982	11 386		
1983 * As of Decembe	r 31, 1983.		
Societ	TABLE II y Annual Meetings		
10//			
1966	Chicago, Illinois		
1967	Chicago Illinois		
1969	Detroit, Michigan		
1970	Chicago, Illinois		
1971	Cleveland, Ohio		
1972	Philadelphia, Pennsylvania		
1973	Milwaukee, Wisconsin		
1974	Atlanta Georgia		
1976	Chicago, Illinois		
1977	Los Angeles. California		
1978	Toronto, Canada		
1979	Cleveland, Ohio		
1980	Cincinnati. Ohio		
1981	Philadelphia, Pennsylvania		
1982	San Francisco, California Mexico City, Mexico		
1985	Chicago Illinois		
1985	Toronto, Canada		
1986	Denver, Colorado		
1987 1988	Atlanta, Georgia Pittsburgh, Pennsylvania		
So	TABLE III CIETY PRESIDENTS		
1965-1966	Robert B. Moore		
1966-1967	Carl R. Olson		
1968	James L. Cooney		
1969	Donald S. Brereton		
1970	Harold G. Frostick		
1971	Arthur M. Killin		
1972	Irvin N. Howell, Jr. W. R. (Ice) Harris		
1973	George W. Younkin		
19/4	John F. Cachat		
1974	EA (Trank) Each		
1974 1975 1976	F. A. (Iony) Furtari		
1974 1975 1976 1977	Robert V. Wachter		
1974 1975 1976 1977 1978	Robert V. Wachter Edward A. E. Rich		
1974 1975 1976 1977 1978 1979	F. A. (Tony) Furtan Robert V. Wachter Edward A. E. Rich H. Paul Meisel		
1974 1975 1976 1977 1978 1979 1980 1981	Robert V. Wachter Edward A. E. Rich H. Paul Meisel James H. Beall George H. Bohert		
1974 1975 1976 1977 1978 1979 1980 1981 1982	Robert V. Wachter Edward A. E. Rich H. Paul Meisel James H. Beall George H. Bobart Bernard W. Whitington		
1974 1975 1976 1977 1978 1979 1980 1981 1982 1983	Robert V. Wachter Edward A. E. Rich H. Paul Meisel James H. Beall George H. Bobart Bernard W. Whittington George W. Walsh		

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Figure 5. The five Operation Departments were structured in 1977.

TABLE IV PAST SOCIETY PRESIDENTS WHO SERVED ON THE IEEE BOARD OF DIRECTORS		TABLE V Society Outstanding Achievement Award		
Donald S. Brereton	1977–1978 1979 1980	Director, Division II IEEE Secretaty-Treasurer IEEE Treasurer	1969 1970	Robert B. Moore Charles F. Dalziel
F. A. (Tony) Furfari	1979-1980	Director, Division II	1972	Boris Mokrytzki
Irvin N. Howell, Jr.	1980–1982 1983–1984	Director, Standards Activities Director, Division II	1973 1974 1975	Robert V. Wachter Harold Winograd Walter R. Harris
James H. Beall	1983-1984	Director, Standards Activities	1976 1977	Ralph H. Lee Irvin N. Howell, Jr.
			1978 1979 1980	Richard H. Kaufmann F. A. Furfari Richard M. Emberson

This year marks the one hundredth anniversary of the foundation of AIEE. As a result the Institute created 1984 Centennial Medals to recognize outstanding service to the Institute. The thirty individuals receiving a Centennial Medal directly from the Society are listed as follows:

Samuel P. Axe Newton Square, PA James H. Beall Skokie, IL George F. Bobart Sykesville, MD Donald S. Brereton Schenectady, NY John F. Cachat Cleveland, OH Kao Chen Bloomfield, NJ James L. Cooney, Jr. Corning, NY Leonard S. Corey Rochester, NY Harold G. Frostick Flat Rock, NC

Daniel L. Goldberg New York, NY W. R. (Joe) Harris Pittsburgh, PA Arthur M. Killin Ashtabula, OH Anthony C. Lordi Earth City, MO William McMurray Schenectady, NY H. Paul Meisel Louisville, CO George U. Messner Atlanta, GA Donald T. Michael Covington, KY Russell W. Mills

Cleveland, OH

W. L. Moser Chicago, IL
Richard S. Nichols Corvallis, OR
Carl R. Olson Pittsburgh, PA
Edward A. E. Rich Schenectady, NY
Jay A. Stewart Freeport, NY

Robert B. Moore

Schenectady, NY

William L. Wachs Cincinnati, OH
Robert V. Wachter Vancouver, WA
George W. Walsh Schenectady, NY
Bernard W. Whittington Charleston. WV
George W. Younkin Found du Lac, WI
Myron Zucker Bloomfield Hills, MI

Irvin N. Howell, Jr.

Birmingham, AL

Edward A. E. Rich

Anthony C. Lordi Ion I. Inculet

Russell W. Mills

IAS HISTORY - PART I

Awardees nominated by the Society who have received an IEEE Centennial Medal and Certificate from another IEEE entity.

1981

1982 1983

1984

F. A. (Tony) Furfari Pittsburgh, PA

Those members of the Society that received a Centennial Medal from other Institute entities (Society, Section, or Board) are listed as follows:

James C. Arnold	Paul P. Biringer	Stuart H. Bouchey
Arlington, VA	Toronto, ON, Canada	Washington, DC
John E. Barkle	J. Lewis Blackburn	Hugh R. Brand
San Mateo, CA	Bothel, WA	Kingston, Jamaica
Raymond Bartnikas	Alfred R. Bolz	Allen S. Brower
Varennes, PQ, Canada	Baltimore, MD	Schenectady, NY
Baruch Berman	Guy W. Boswick	Robert K. Brown
Rancho Palos Verdes, CA	Hampton, VA	Plainfield, IN

Ronald D. Brown Muscatine, IA Harry P. Bruncke Falcon Heights, MN L. M. Burrage Franksville, WI R. E. Burridge Fredericton, NB, Canada Guillermo Castillo Lima, Peru D. Osvaldo Cleghorn Panama, Republic of Panama Charles Concordia Venice, FL Warren H. Cook Chicago, IL

Joseph P. Douglas York, PA Malcolm Drummond Henrietta, NY Robert S. Duggan, Jr. Atlanta, GA Robert O. Duncan Hartford, CT Richard M. Emberson Eugene, OR Chester G. Feeser Ellicott City, MD Michael J. Foley Denver, CO John D. Freed Oklahoma City, OK John S. Fridrick Toledo, OH James C. Gentry Baton Rouge, LA Robert W. Gillette South Yarmouth, MA David G. Gisser Albany, NY Edward F. Glass Winnipeg, MB, Canada Paul H. Gomulkiewicz Wenatchee, WA Glen R. Griffith Harvey, IL L. L. Grigsby Blacksburg, VA Eric T. B. Gross Schenectady, NY Howard B. Hamilton Pittsburgh, PA J. C. Handy Baltimore, MD Charles D. Hansell Irving, TX J. E. Harder Bloomington, IN Eric Herz

New York, NY

Robert G. Daniels

Anderson, SC

Timothy T. Ho Oakland, CA Michael G. Hoffman Portland, OR James D. Huddleston, III Atlanta, GA Roland L. Hurter Houston, TX David R. Hutt Aukland, New Zealand Ion I. Inculet London, ON, Canada Daniel W. Jackson Salem, VA M. D. Johnson Columbia, SC L. R. Kersey Vancouver, BC, Canada Robert F. Kerwin Houston, TX Shoab A. Khan Montreal, PQ, Canada Keith W. Klontz McHenry, IL L. Rex Kolpfenstein Bowling Green, OH Myoung S. Ko Seoul, Korea Cecil W. Koehler Cuyahoga Falls, OH Joseph L. Koepfinger Pittsburgh, PA R. V. Kolar Tallahassee, FL William R. Kruesi Fairfield, CT Dennis W. Lamont Mount Prospect, IL James H. Layne Richmond, VA Ralph H. Lee Wilmington, DE William A. Lewis Sunnyvale, CA Carlos A. J. Lohmann

Frank E. Lord San Carlos, CA H. W. Lord Mill Valley, CA Daniel J. Love Los Angeles, CA R. Mohan Mathur Winnipeg, MB, Canada Orest A. Meykar San Salvador, El Salvador William W. Middleton Philadelphia, PA Fumio Minozuma Tokyo, Japan Alexander E. Molinski Johnstown, PA J. P. Montgomery, Jr. Oregon City, OR John H. Moore San Ramon, CA Bro. Philip Morgan Memphis, TN Hugh O. Nash, Jr. Nashville, TN Marvin A. Needler Indianapolis, IN John P. Nelson Evergreen, CO Hans A. Norberg Tulsa, OK Norbert R. Orszula Lombard, IL A. D. Page, Jr. Spartanburg, SC Dipak D. Patel Nairobi, Kenya Joseph R. Perkins Newark, DE D. A. Peterson Edmonton, AB, Canada D. L. Pettit Wauwatosa, WI Kennard B. Pinder Cape Coral, FL Raymond A. Power Los Gatos, CA

W. Harry Prevey Willowdale, ON, Canada Daniel K. Reitan Madison, WI Charles E. Rettig New Berlin, WI Carlos F. Ribeird Salvador, Brazil John B. Richards Denver, CO John F. Richardson, Jr. Honolulu, HI Arthur R. Ritter Tipp City, OH F. F. Robinson, Jr. Bay City, MI Jesus E. Roiz Miami, FL Paul T. Ryan Erie, PA Ted S. Rzeszewski Lombard, IL Robert M. Saunders Irvine, CA Robert E. Scarbrough Sarasota, FL Alfred W. Scheide Cincinnati, OH Frank E. Schink New York, NY Roland Schinzinger Irvine, CA Gustave Shapiro Washington, DC Donald B. Sinclair Boston, MA Gordon R. Slemon Toronto, ON, Canada Audrey J. Smith Los Angeles, CA Martin R. Smith St. Louis, MO A. Dayton Snyder Miami, FL Robert A. Soderman Santa Clara, CA

Herbert F. Storm Delmar, NY Robert K. Sullivan New York, NY R. Sundararaman Madras, India Frederick W. Symonds Knoxville, TN John J. Tary Boulder, CO B. Richard Teare, Jr. Pittsburgh, PA John J. Temin Cleveland, OH K. Reed Thompson Salem, VA Victor C. Urrutia Panama, Republic of Panama Jack P. Vainstein Lima, Peru Roberto Valenzuela Bogoto, Columbia Ricardo Valle-Sanchez Bogoto, Columbia John T. Vitale New York, NY John E. Waters Northlake, IL Bryan Webb, Jr. Fayetteville, AR Curtis B. White Rockford, IL Robert C. Williams Baton Rouge, LA T. Lamont Wilson Louisville, KY Herbert H. Woodson Austin, TX Charles J. Wylie Charlotte, NC Roy J. Yee Honolulu, HI Moon H. Yuen Hayward, CA Ned L. Zeigler Toledo, OH

#### CONCLUSION

São Paulo, Brazil

It is my hope that this article might be more useful by concluding with comments on the following half dozen areas:

- continuing need for applications oriented Technical Papers,
- 2) involvement in the Technical Conferences of the Society,
- 3) expanding the Society publications,
- support for nominations for Fellow and Institute Awards,
- 5) participation in Chapters of the Society, and
- 6) opportunities for service in the Society and the Institute.

Each of these six subjects above are now individually reviewed as follows.

 Relatively few of the 35 Society TRANSACTIONS, seven Society Journals, and 13 Society Magazines are formatted towards the publication of *application* oriented Technical Papers. This is the principal thrust of our Society's TRANS-ACTIONS!

If you have not yet shared your knowledge and experience with your associates at one of the Society's many annual Technical Conferences please consider doing so. It does require significant time and effort to prepare an effective Technical Paper but there is a real satisfaction in offering a successful manuscript. There is also a series of Committee Prize Paper Awards and Society Paper Prize Awards that recognizes excellence.

2) Of the 33 Societies in the Institute the Industry Applications Society offers eleven Committee, Department, or Society Technical Conferences each year. (This does not include the multi-Society sponsored Technical Conferences.)

It would be informative to attend the Technical Conferences of your specialty. If you wish to obtain a broad overview of the many technical areas within the scope of the Society you may wish to attend the Society Annual Meeting; It is typically held about the first week of October. This provides the experience of observing how Technical Papers are presented so you could do so in the near future.

3) Over the past two decades the Society has given exceptional support to its IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS. The present Editor, Ed Rich (a former Society President) is doing a superb job in expanding the content and strengthening the TRANSACTIONS. The periodic evaluation of the TRANS-ACTIONS of the Institute by the IEEE Publications Board consistently rates the IAS TRANSACTIONS as one of the finest in the Institute.

For many years Pat Brooks has given devoted and noble service in publishing the IAS Newsletter. Under the direction of Publications Department Chairman Vince Falvo and Administration Department Chairman Randy Houlton a plan to expand significantly the IAS Newsletter this year is now being implemented. Former Society President and Division II Director Tony Furfari is the new Editor of our IAS Newsletter. With more than double the budget, so as to expand the news of the Society significantly, the new Newsletter should be very informative to the Society membership.

4) It is appropriate to observe that of the several largest Societies of the Institute the number of IAS members that are elected to the Fellow Grade is about half of those elected from other large Societies. A principal reason for this is that very few individuals are willing to give the significant time and energy that is required to prepare a Fellow nomination. Each year the Society Fellows Committee should receive at least three or four times the number of applications it has been receiving for the past several years. The first step is to become a Senior Member; if you have ten years of constructive experience and you are not a Senior Member you should submit your application immediately.

It is recognized that the awards program of the Institute is shaded towards those who work in various research fields. Nevertheless, the number of nominations for the Institute's Major Medals or Field Awards that have sought support from the Society is almost negligible. There is a need to develop more distinguished recognitions for application work but there is also a need to stimulate nominations for the presently available Institute awards.

5) Every member of the Society should endeavor to support their local IAS Chapter (as a part of their local IEEE Section). If you have a Chapter do you attend its meetings? Do

you participate? Do you serve?

If there presently is not an IAS Chapter in your Section are you willing to assist in having one established? Would you be willing to be a charter member of the Chapter?

A strong Chapter organization means a more vital Society-that can, in turn, be of increased service to you.

6) It is important for a Society to provide many opportunities of service-after all the Society belongs to the members.

There are twenty-nine Technical Committees as a part of the Society, and it is anticipated that they are all continuing to seek for informed and devoted members. There are also many opportunities on the many commmittees of the five Staff Departments of the Society.

As noted there is the value of preparing, from time to time, a Technical Paper. There is also the possibility of participating in or attending a Technical Conference.

When there is an IAS Technical Conference in your city there is a broad need for staff support.

There is the opportunity to be informed by carefully reviewing the IAS TRANSACTIONS and the IAS Newsletter. There is also the possibility of ordering a Conference Record from a Technical Conference that you were not able to attend.

Consider also that if you are not yet a Senior Member and, if you are qualified, it is appropriate to promptly process the application. There is also the opportunity to prepare yourself to be qualified for nomination to the Fellow Grade and support others for nominations to be a Fellow of the Institute.

The Institute is the largest and most successful professional organization of its type in the world. It constantly strives to inform and assist its membership through its excellent publications the IEEE SPECTRUM, THE INSTITUTE, and other Institute periodicals and publications. The Society, in turn, provides valuable and useful information to those associated with the Society's publications, Technical Conferences, and other activities. You are extended a warm welcome to further assist, support and become more involved in the affairs of the IEEE Industry Applications Society.



Donald S. Brereton (S'44-M'48-SM'55-F'71) received the B.S.E.E. degree from the University of Colorado, Boulder, In 1946.

After a year's service as an Engineering Officer aboard a U.S. Naval destroyer in China, he joined the General Electric Company test engineering program in 1947. A year later he became an Engineer with the Switchgear Department, then in 1949 he became an Application Engineer with the Industrial Power Systems Engineering Operation (IPSEO) in Schenectady. In 1956 he became Manager of Power

Application Engineering, and in 1966 became Technical Communications Manager. In 1969 he joined the Industrial Sales Division as Manager of Industry Market Development. He returned to IPSEO in 1974 as Manager of Market Development.

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# IAS HISTORY— PART II

# A Further History of The IEEE Industry Applications Society

Donald S. Brereton, IEEE Life Fellow

The Centennial of the Institute in 1984 resulted in the request from IAS President Dick Nichols and IAS TRANSACTIONS Editor Ed Rich for me to prepare the eight page history of the Society (on pages 24 to 31 of this report). The principal approach was to review the organization diagrams of the IEEE Industry and General Applications Group (as it came into being on January 1, 1965) and the IEEE Industry Applications Society (as it moved from the IGA Group to become a Society on January 1, 1977) at the time of the Centennial year.

It is the purpose of this two page supplement (pages 32 and 33) to review further changes in the Society organization from 1984 to 1995. Comments will also be provided concerning the conversion of the Administration Department to become the Awards Department in 1996.

The fourth organization diagram of the previous report, illustrating the five Operating Departments in 1977, continued as the basic structure until 1989. There were, as expected, a few changes in the Technical Committees for several of these Departments.

In 1990 a sixth Operating Department, the Manufacturing Industries Department, was added to investigate if such a Department would be helpful to simulate this technical area. Fig. 1 illustrates the 1990 organization. In 1991 the three remaining committees of the General Industries Department (Marine Transportation, Materials Handling Industry and Packaging Industry) proved to be not very strengthening; this resulted in dissolving this Department in 1991. Since one of these committees, Marine Transportation, was primarily directed toward standards activities, it was transferred to the Standards Department in 1991.

In 1993 further changes were made

in the Operating Departments. It was then the decision of the Society Executive Board to combine the Manufacturing Industries Department and the Industrial Utilization Systems Department to form the Manufacturing Systems Development and Applications Department. A further change was made at this time when the Glass Industry Committee (because of its standards activities) was transferred from the Process Industries Department to the Standards Department; the status of this committee is still under study.

The organization of the four present Operating Departments—Manufacturing Systems Development and Applications Department, Process Industries Depart-



Figure 1. The 1990 Society organization which had six Operating Departments and five Staff Departments.

Power Conversion Systems Department have continued into 1995—and no changes are expected in 1996. In 1993 a review was made of the seven Society Standing Committees. It was felt that the Energy Committee and the Professional Activities Committee

the Professional Activities Committee and would be better served as a part of the Administration Department; this change was made in 1994. With the establish-

ment, Industrial and Commercial Power

Systems Department, and Industrial

ment of the new Education Department in 1995 this provided the appropriate opportunity of transferring another Standing Committee, the Student Activities Committee, to the Education Department. This resulted in needfully decreasing the number of Standing Committees to the four essential committees which are now: Constitution and Bylaws Committee, Financial Planning Committee, Long Range Planning Committee, and the Nominating Committee.



Figure 2. The current (1995) Society organization which consists of four Operating Departments and six Staff Departments.

At this time the four Operating Departments and the four Standing Committees are currently in a very stable format. Fig. 2 depicts the 1995 organization.

The Society Executive Board has been reviewing, for a number of years, a major change in one of the Staff Departments the Administration Department.

In 1996 the Administration Department is scheduled to be replaced by the Awards Department. There has been a need to strengthen the awards program of the Society and to make a major step to establish an effective procedure to help endorse possible candidates for the various Institute Medals and Technical Field Awards. As an element of this reorganization there will be a need to reassign a few of the committees of the Administration Department to other Society components.

The Awards Department will be made up of three existing functions: Fellow Review Committee, Society Outstanding Achievement Committee, and the Society Distinguished Service Award Committee; there will be two new functions and they are: Society Outstanding Young Member Award Committee and the Awards Nomination Committee. As noted it will be needful to reassign a few current committees of the Administration Department; these will include the Membership Committee to become a part of the Chapters Department and the History Committee as a part of the Publications Department. There are two additional functions, the Energy Committee and the Professional Activities Committee (because they are not "technical" but "liaison" functions) they are presently probably to be assigned to the Society Past President.

As a closing comment—it has been my opportunity to be associated with the Society when it was first being developed in 1964; it was also possible to serve on the Society Executive Board for fourteen years, the first Editor of the IAS **Transactions** for eight years and as the Society President in 1969. This has been a most special experience with the result of establishing many great and dear friends. Certainly the IEEE Industry Applications Society is one of the great Societies of the Institute.











# Our Long-Term Strategic Outlook

he vision statement of the IEEE Industry Applications Society (IAS) is that the "IAS will be a world leader

THE IAS

LEADERSHIP

HAS SPENT

SIGNIFICANT

TIME IN

DEVELOPING

PLANS TO

**ACHIEVE THIS** 

VISION.

in the advancement of technology and dissemination of

technical information of technical information to support professionals engaged in the applications of electrical and electronic engineering to industry." The IAS leadership has spent significant time in developing plans to achieve this vision.

The IAS pursues the advancement of the theory and practice of electrical and electronic engineering in the development, design, manufacture and application of

electrical systems, apparatus, devices, and controls to the processes and equipment of industry and commerce; the promotion of safe, reliable, and economical installations; industry leadership in energy conservation and environmental health and safety issues; the creation of voluntary engineering standards and recommended practices; and the professional development of its membership.

IAS board members along with the past presidents, volunteers representing the geographical region Chapters, and IAS staff met for a two-day work-

Digital Object Identifier 10.1109/MIAS.2014.2362035 Date of publication: 10 December 2014 shop, which was facilitated by Shelly Alcorn of Alcorn Associates. The group took part in interactive discussions based upon critical questions identified by the IAS leadership. All discussions and activities were de-

signed to elicit ideas on how the IAS can continue to shape its strategic environment on three different time frames-ten years, five years, and one to two years. One of the purposes of having retreats such as this is to develop themes to guide the Society as it moves into the future. We were able to identify two common themes that ran through a majority of the discussions: globalization and youth. All strategic initia-

tives that the IAS chooses to pursue should have at least a portion of the objective address the increasing globalization of the IAS membership and be attractive and useful to younger members. If a strategic objective does not satisfy or address either condition—globalization or youth—it should be reevaluated to determine if it really is a priority for the IAS.

In an effort to fulfill this vision and mission at the highest level of excellence, both in the near term and the long term, the IAS will

embrace globalization and increase worldwide engagement of members, volunteers, and stakeholders in Society activities, thereby creating a vital, multicultural ecosystem

focus on creating educational solutions, training, and access to career development services to encourage the youth of today to become the engineers of tomorrow.

The following five key areas were identified:

- governance and finance
- membership
- education and careers
- marketing and communications
- outreach, policy, and advocacy.

Strategic acts, where focus should be given to achieve the vision and mission, and to which various elements from the strategic themes will be incorporated into the overall IAS strategic plan. The IAS Board is focusing on these items, and initiatives are being developed to incorporate these key elements. Some of the details for implementation are given below.

#### **Governance and Finance**

#### **Board Culture**

Obtain training and search for resources to ensure that the board acts as a "strategic board" rather than a "working board."

#### **Board Composition**

Establish appropriate board positions to get sufficient focus on new technologies that could disrupt our technical committees.

#### **Technical Committees**

Set up a technical committee incubator to identify, nurture, and address new areas of technology not currently covered.



Participants of the IEEE IAS Long-Range Planning Meeting in Atlanta.

- Develop specific roles for active students/younger members in technical committee operations.
- Provide a repository of best practices and tools for technical committees to use to save time, streamline operations, and learn from each other.

#### Finance

 Develop a concrete strategy to attract more industries to IAS, with an emphasis on exhibiting and sponsorships.

#### Membership

#### Recruitment

- Develop ways to match volunteers with volunteer opportunities, considering their current skills and talents as well as the competencies they would like to develop. Utilize tools, such as membership applications and databases, to capture and make that information useful and available.
- Support, engage, and incentivize post-university membership.

#### Retention

 Develop roles and responsibilities for retiring members to ensure that we do not suffer from significant brain drain as baby boomers begin to retire and so that we can take advantage of their knowledge and skills.

- Consider the impact on membership if our globalization strategy focuses on preserving differences and diversities, building bridges between members, and eliminating barriers in terms of communications and access.
- Determine how demographic and population shifts may impact the IEEE IAS membership over the next decade.

#### **Education and Careers**

#### **Education Plan**

- Develop a comprehensive education plan that includes target demographics, content strategy, and delivery vehicles.
- Obtain additional staffing and volunteer resources to devote to developing the education plan.

#### Conferences

Consider implementing more robust "virtual" options both for attendees and the delivery of content.

# Standards, Courses, and Credits

- Develop ask-the-expert opportunities both in person and online.
- Expand online education with an applications focus. Start with content we have on hand but also provide unique technical content not taught in schools.

#### Marketing and Communications

#### Marketing

 Develop a comprehensive marketing and communications plan. Include public relations and media relations components to ensure IAS is a go-to source for the media regarding technical issues.

#### Vehicles

- Utilize social media effectively.
- Record and post more video content for IEEE.tv, YouTube, the IAS Web site, and so on.
- Have a leadership presence at conferences focused on promoting the IAS to attendees.

# Outreach, Policy, and Advocacy

- Conduct outreach to sister Societies to see if we can share strategic plans, best practices, etc.
- Hold discussions to see where we might be able to leverage each other for the benefit of all.

In the coming months and years, the board will work on implementing several of these ideas to move the IAS to achieve its vision. But as always, the IAS requires the support of the whole volunteer community to successfully execute the plans. The future is ours, and in Mahatma Gandhi's words, "The future depends on what you do today." Let us work to seize the future.



# Future Initiatives for the IAS

he IEEE Industry **Applications Society** (IAS) has a rich and diverse history over the past 50 years. We are very pleased and honored to be members of this extraordinary technical community that includes thousands of IAS volunteer contributors who served before us. Of course, although we collectively have many years of success behind us, our Society leadership is also very focused on looking forward to the next 50 years. To keep our focus on the future, in December 2013, Society Vice President Tomy Sebastian, who is responsible for long-range planning, sponsored a two-day Society strategic planning session in Atlanta, Georgia. Thirty-two Society leaders participated in the event, including five board members, nine past presidents, four Chapter representatives, three IEEE staff members, and one professional facilitator. The group established a road map for the future of the IAS.

Our focus for the future is based on two core initiatives: 1) globalizing our footprint with growth emphasis in Regions 8–10 and 2) achieving growth through younger member and student initiatives to seed our organization with the next generation of leaders. As our Society moves forward to the year 2020 and beyond, we see these two initiatives as strategically critical to our continued growth and relevance to our active members across the globe.

Digital Object Identifier 10.1109/MIAS.2014.2362036 Date of publication: 10 December 2014 As we consider our path forward, I am proud to see that our Society is already making great strides in both globalizing and recruiting our next generation of volunteers. For instance, the IAS sponsored the International Transportation Electrification Conference (ITEC) in April 2014. This event was held in Dearborn, Michigan, with

a focus on new technologies for vehicle electrification. This very exciting and successful event was organized by several of our Transportation Systems Committee volunteers based primarily in North America. The ITEC will soon be going global with plans for IAS-sponsored ITEC Asia-Pacific events in China, Japan, and Korea. Similarly, volunteers from our Process Industries

Department's Petroleum and Chemical Industry Committee sponsor largescale conferences focused on the global oil and gas process industry in the United States as well as Mexico, Brazil, and soon the Middle East.

Consider for a moment why it is important for technical communities in industries such as electric vehicles and petroleum and chemical to globalize. Why not simply pursue the best technology practices in our own regions? Going back in history, this is of course exactly what happened. For instance, the European Union is largely credited to electrical product standards based on the International Electrotechnical Commission (IEC), while most North American electrical product standards are based on the American National Standards Institute (ANSI) platform. In the past few years, there has been an exciting trend driving toward the harmoniza-

OUR SOCIETY LEADERSHIP IS ALSO VERY FOCUSED ON LOOKING FORWARD TO THE NEXT 50 YEARS.

tion of regional standards and moving toward global standards. This effort is directly facilitated by our IAS technical committees coming together to share best practices and find common ground. Society activities to globalize technical committees and conferences are more than simply duplicating technical content in different regions. Engineers collaborating

across regions serve as an important part of our core in our strategy to truly globalize our supported industries and industry applications.

On the young members front, the leadership of our Chapters and Membership Department (CMD) has helped to drive our Student Branch Chapters to eclipse the 200 mark in 2014 with a push to grow further. The CMD routinely sponsors more than 60 student delegates from all regions who attend our IAS Annual Meeting. Over the past few years, it has been exciting
to participate in the CMD dinner on Monday night of the conference. Students from all over the world share their active contributions to the on-campus technical community as well as the cultures and customs that make their countries the places that they are proud to call home. It is a multicultural event that has become one of the unparalleled highlights of our annual conference.

Our Society is on the right path, and we are working hard to focus on better ways to support our constituents and continue to grow our technical community. Of course, we can always do more. As a member of our Society leadership team, I challenge each of you, our members, to find a few extra hours during your very busy week to make a meaningful contribution to our Society. Your involvement in every area, whether it is conferences, standards, or Chapters, can really make a difference not only for the Society but also for your professional

WE ARE WORKING HARD TO FOCUS ON BETTER WAYS TO SUPPORT OUR CONSTITUENTS. career. I can certainly attest that the IAS has been an enriching and rewarding experience in my career. My many hours of volunteer work have returned a tenfold benefit in my technical knowledge, business acumen, and lifelong relationships. Together let's make the next 50 years of the IAS even better than the last! 145



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