

ACCESS THE RESOURCES, RESEARCH & BENEFITS OF THE INDUSTRY APPLICATIONS SOCIETY AND IEEE SA STANDARDS DEVELOPMENT

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July 9, 2021

PRESENTERS

IEEE SA STANDARDS ASSOCIATION

IEEE

Access the Resources, Research & Benefits of the Industry Applications Society (IAS) and IEEE SA Standards Development

Friday, 09 July 2021
8:00 AM - 9:00 AM ET

IAS
IEEE INDUSTRY APPLICATIONS SOCIETY
Linking Research to Practice

SPEAKERS

**Wei-Jen Lee**
President, IEEE Industry Applications Society (IAS)
Director, Energy Systems Research Ctr., & Professor of Electrical Engineering, University of Texas

**Daleep Mohla**
IEEE IAS Standards Department Chair
IEEE 1584 Working Group Chair

**Patricia Roder**
Senior Program Manager
IEEE Standards Association

QUICK HOUSEKEEPING ITEMS

1

Upon entering the webinar, all attendee lines are automatically **MUTED**. Today's presentation is a one-way broadcast.

2

If you are experiencing technical issues (audio or visual), use the **CHAT feature** and message the host, for help troubleshooting.

3

To ask **QUESTIONS** throughout the webinar, use the Q&A feature.

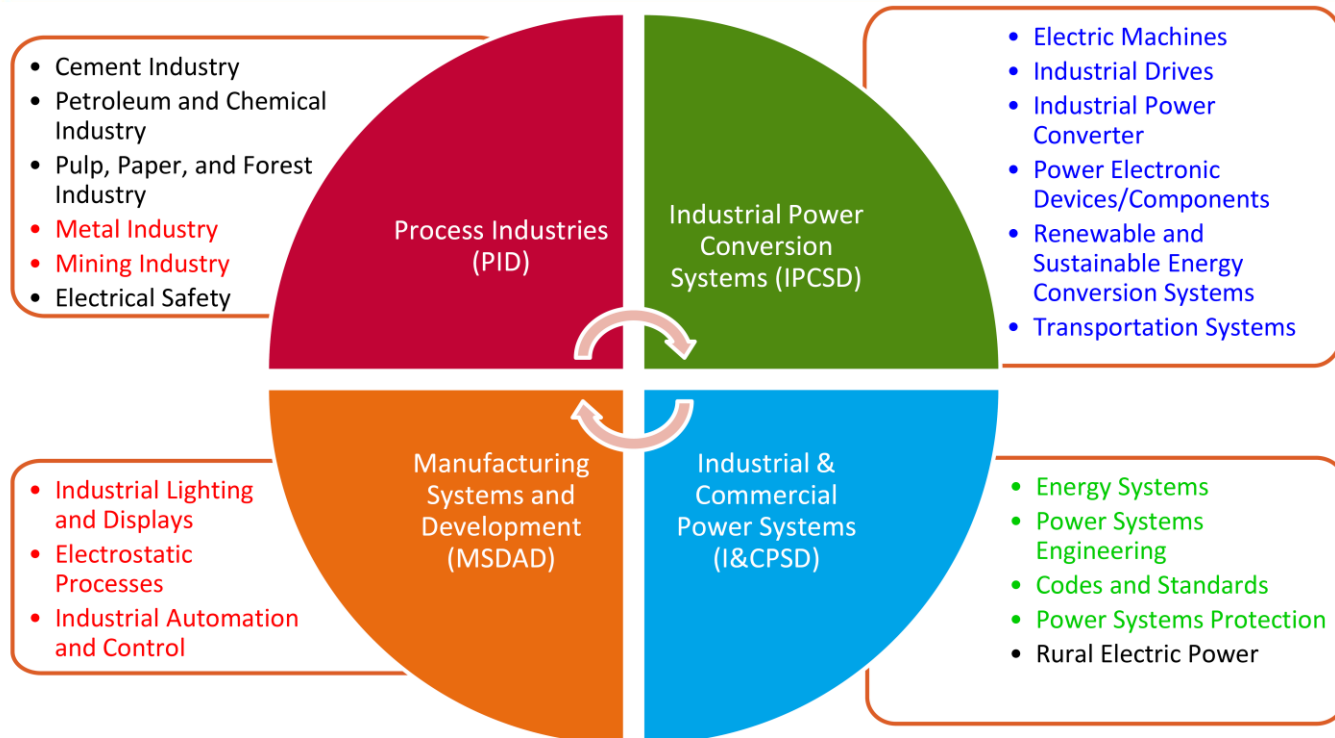
RESOURCES AND OPPORTUNITIES WITHIN THE IAS FOR RESEARCH ENHANCEMENT AND CAREER DEVELOPMENT



IEEE INDUSTRY APPLICATIONS SOCIETY (IEEE-IAS)

- **IAS is the sixth largest society within IEEE**
- **We Value:**
 - The advancement of theory and practice of electrical and electronic engineering for the benefit of humanity;
 - The promotion of safe, reliable, sustainable and economical installations;
 - The sharing of knowledge in our domains;
 - The creation of engineering standards and recommended practices;
 - The professional development of our global membership

DEPARTMENTS AND TECHNICAL COMMITTEES OF IAS



Red/Green: IAS Annual Meeting; Blue: ECCE; Black/Green: Organize Its Own Meeting

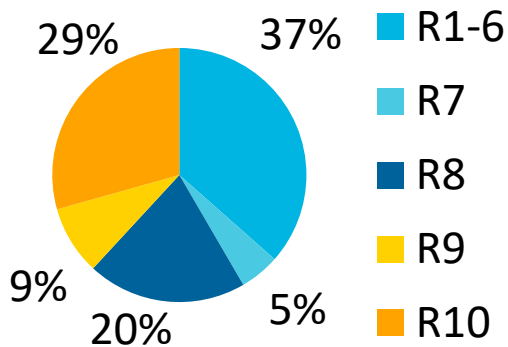
SUSTAINABLE DEVELOPMENT OF IAS

- **Modernization and Enhancement of the Current Technologies**
- **Bridging and Leading the Emerging Technologies**
 - Smart Grid/Smart Cities/Net Zero (Positive) Building
 - Renewable Energy, DER, and Energy Storage Systems
 - Secure, Reliable, and Efficient Data Center Operations
 - Industry 4.0 and Smart Manufacturing
 - Applications of 5G Technology
 - Robot, UAV, and Unmanned Vehicle Technologies
 - AI, AIoT, IIoT, Deep Learning and Machine Learning
 - Applications of Wide Bandgap Semiconductors
 - Cyber and Physical Security

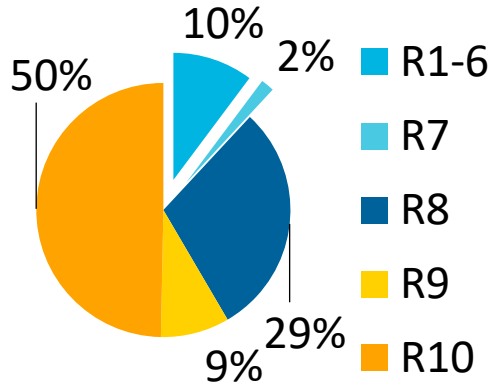
MEMBERSHIP COMPOSITION

- **Chapters and Membership** (<https://ias.ieee.org/chapters-membership.html>)
 - 474 Chapters (171 Technical Chapters and 303 Student Branch Chapters)

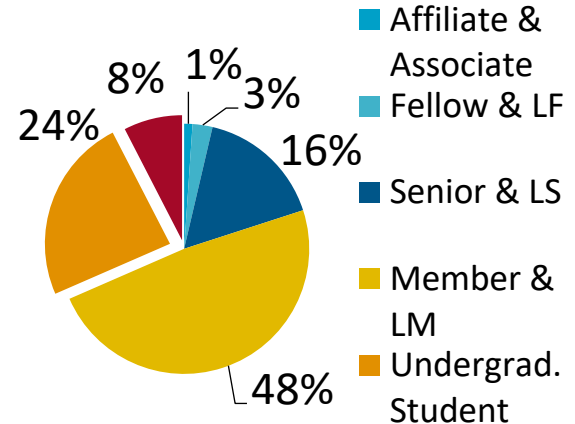
IAS Membership by Region, 2019



IAS New Members 2018 by Region



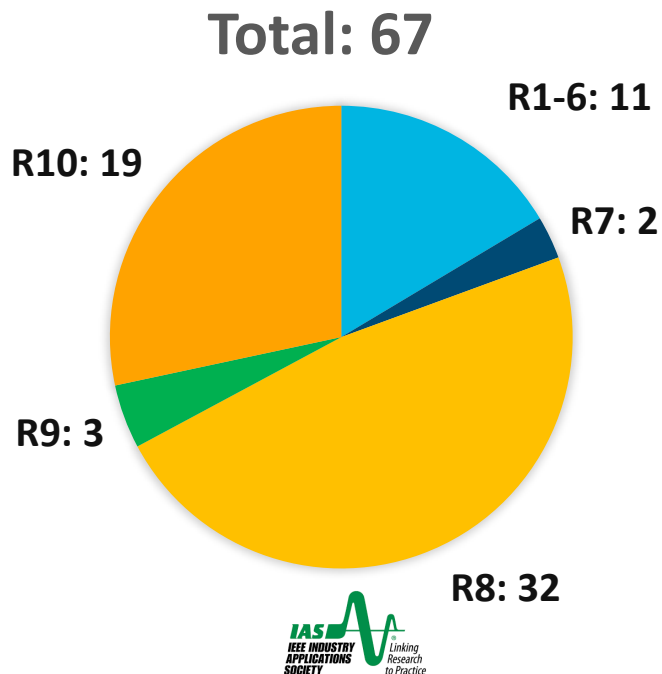
IAS Members by Grade



AVAILABLE RESOURCES AT IAS

- **Conferences**

- IAS sponsored conferences by Regions in 2019



AVAILABLE RESOURCES AT IAS

- **IAS Publications**

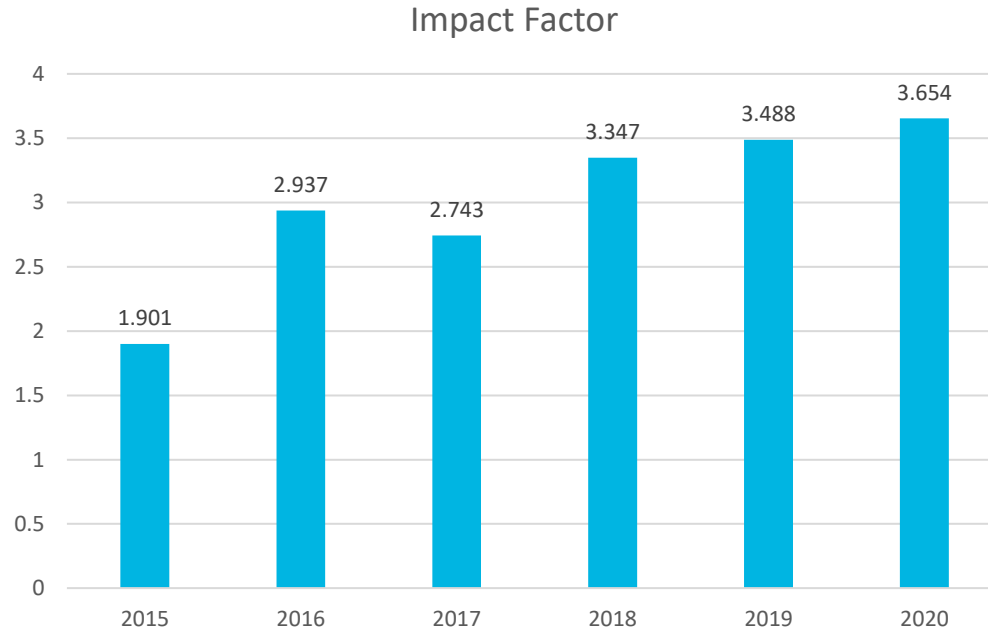
- IEEE Transactions on Industry Applications
- IEEE Industry Applications Magazine
- Open Journal of Industry Applications

- **Joint Publications**

- IEEE Transactions on Transportation Electrification
- IEEE Transactions on Sustainable Energy
- IEEE Electrification Magazine
- IEEE Transactions on Smart Grid

AVAILABLE RESOURCES AT IAS

- Impact Factors of IEEE Transactions on Industry Applications



AVAILABLE RESOURCES AT IAS

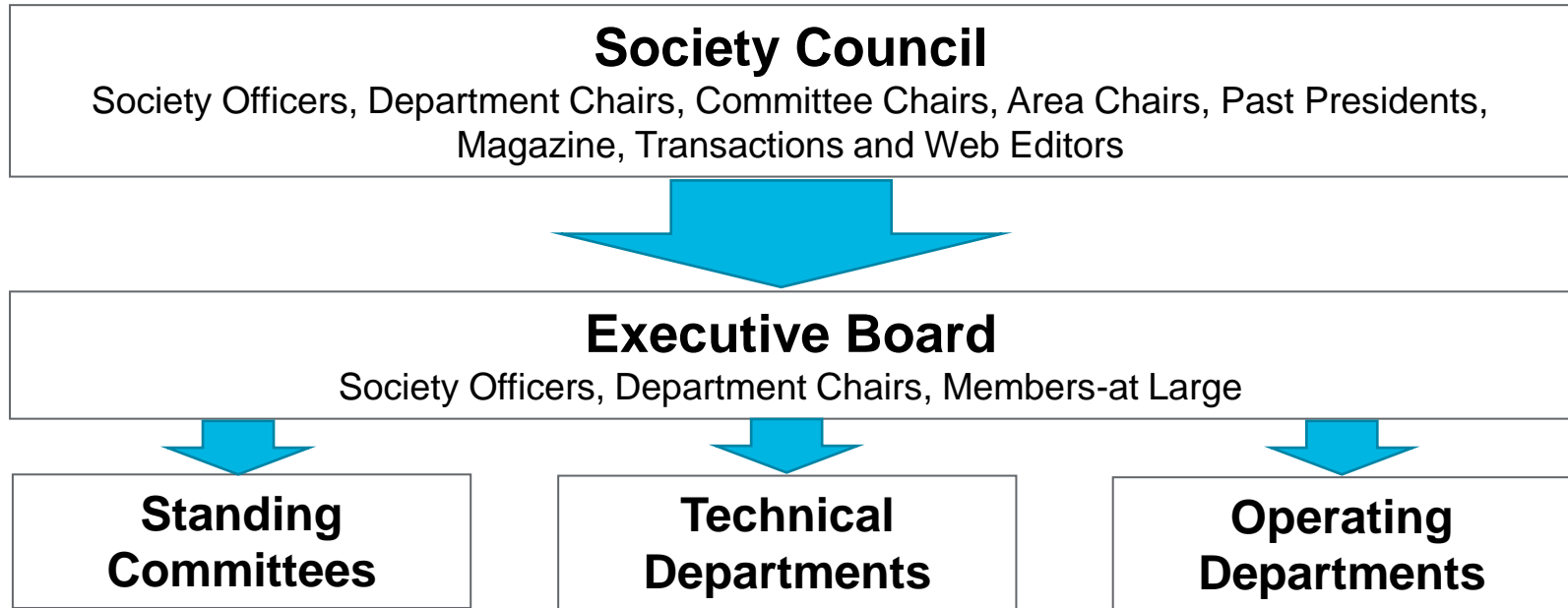
- **Distinguished Lecturers and Prominent Lecturers**
(<https://ias.ieee.org/chapters-membership/distinguished-lecturer-program.html>)
- **Resource Center** (<https://resourcecenter.ias.ieee.org/>)
 - Society Member: Free
 - IEEE Member: US\$11.00/Free
 - Non-Member: US\$15.00/Free
- **IEEE Xplore (Free to IAS Members)**
 - IEEE Transactions on Industry Applications
 - IEEE Industry Applications Magazine

AVAILABLE RESOURCES AT IAS

- **Travel Programs** (<https://ias.ieee.org/chapters-membership/travel-programs.html>)
 - IAS Annual Meeting Travel Grant Program
 - IAS Technical Conference Visit Program for New IAS Chapters
 - IAS CMD Conference Student Publication and Travel Grant Program
 - IAS WIE Initiative Travel Grant Program
 - IAS CMD Conference Information Desk Volunteer Program
 - APEC and ECCE Conference Travel Grant Programs
 - Myron Zucker Prevention Through Design - Student Engineering Education Initiative (ESW)

OPPORTUNITIES AT IAS

- Involved in the Operation and Policy Making of the Society



OPPORTUNITIES AT IAS

- **Awards** (<https://ias.ieee.org/awards.html>)
 - Andrew W. Smith Outstanding Young Member Achievement Award
 - Distinguished Service Award
 - Outstanding Achievement Award
 - Outstanding Young Member Service Award
 - IAS Outstanding Educator/Mentor Award
 - Kliman Award
 - IAS Department and Committee Awards
 - Society and Department Paper Awards
 - Myron Zucker Student-Faculty Grant Program

OPPORTUNITIES AT IAS

- **Standards Development** (<https://ias.ieee.org/standards.html>)
 - IAS is one of the most prolific societies in the standards activities.
 - Currently, IAS has 76 active standards.
 - IAS sponsors a wide range of standards in the subjects such as:
 - System Level
 - * Design and Installation of electrical facilities – Color Books
 - * Electrical Installations on Shipboards and ship to shore connections
 - Installation Level
 - * Installation in Hazardous (Classified) locations
 - Equipment Level
 - * Motor specifications and repairs; and Motor Control Centers for enhanced safety
 - Operation Level
 - * Managing Natural Disasters and Recovery
 - * Arc Flash and Safety by Design
 - * Electrical Heat Tracing

**ACCESS THE RESOURCES, RESEARCH
AND BENEFITS OF THE INDUSTRY
APPLICATIONS SOCIETY (IAS) AND
IEEE SA STANDARDS DEVELOPMENT**

DALEEP MOHLA

IAS STANDARDS DEPARTMENT CHAIR

IEEE 1584-2018 WORKING GROUP CHAIR

INDUSTRY APPLICATIONS SOCIETY (IAS) STANDARDS

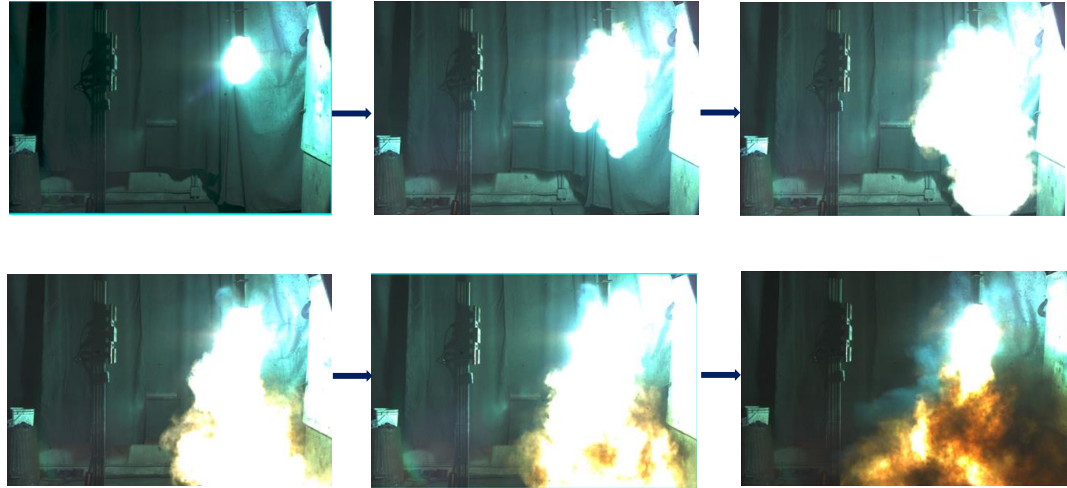
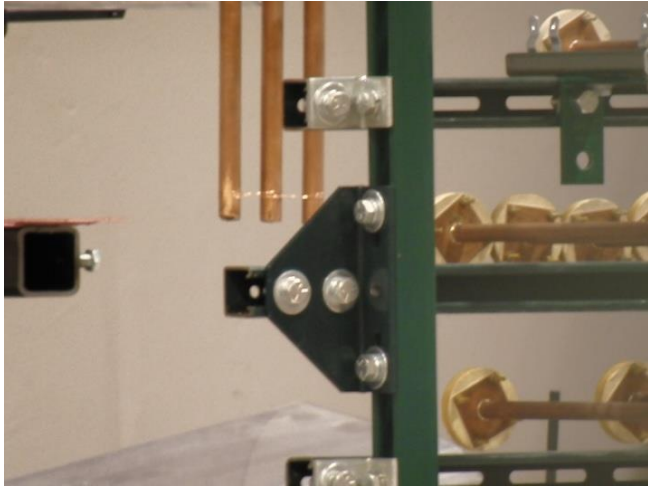
- IAS Standards Department was formed in 1977
- For over four decades IAS standards have focused on the standard development to fulfil the IAS Mission
“to enable the advancement of theory and practice in the design, development, manufacturing and application of safe, sustainable, reliable, smart electrical systems, equipment and services.”
- IAS standards are used globally for:
system studies (short circuit calculations and equipment analysis, motor starting, transient and harmonic analysis, overcurrent device coordination etc.)
Safety (Arc flash hazard calculations, grounding and bonding)
- Marine Industry (Electrical installations on shipboard design, controls, safety considerations)
Equipment specifications, and operation considerations in Petroleum Chemical Industry (motors, variable frequency drives, etc.)
- IAS recently formed a Data Center Subcommittee to specify power distribution equipment
- AND IAS is the Home of the 13 Standards collectively known as “Color Books”

1584-2018- IEEE GUIDE FOR PERFORMING ARC-FLASH HAZARD CALCULATIONS

- Probably best known of the IAS standards.
- Used globally to calculate incident energy caused by a failure in electric equipment during switching.
- For electrical equipment operated on three-phase alternating current (ac) voltages from 208 V to 15 kV.
- Only electric standard in the world based on actual testing.
- Models are based on 2100 tests performed at five different laboratories.
- Documents result of testing and arc trajectories based on horizontal and vertical electrodes.
- Revised and published in 2018.
- Empirical models were derived from the test data.

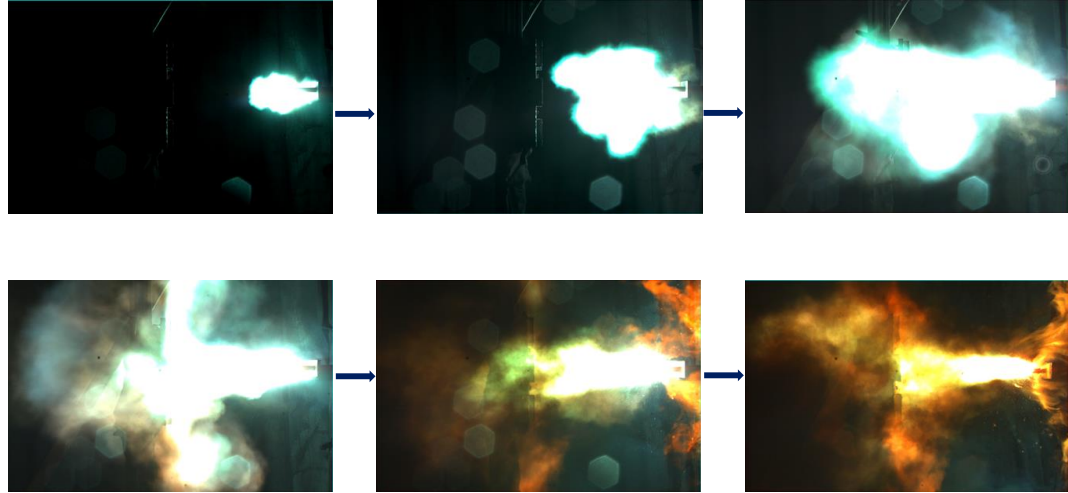
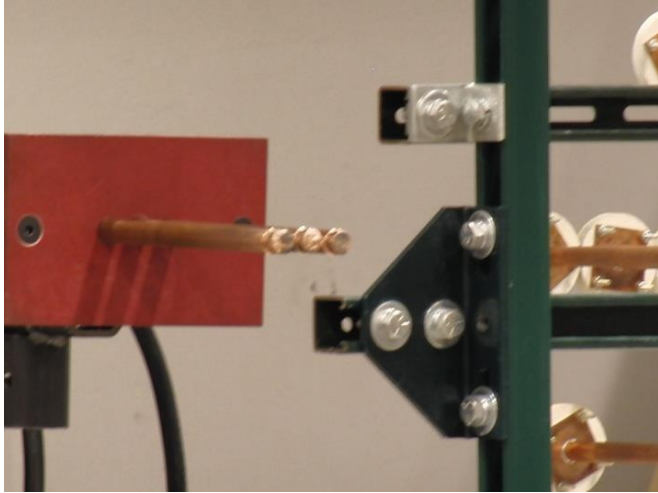
AVAILABLE RESOURCES AT IAS

- Plasma Trajectories of Vertical Configuration



AVAILABLE RESOURCES AT IAS

- Plasma Trajectories of Horizontal Configuration



IEEE COLOR BOOKS



COLOR BOOKS - CONSOLIDATED DESIGN, OPERATIONS AND MAINTENACE STANDARDS

Red Book™— IEEE STD 141™-1993 (R1999), Recommended Practice for the Electric Power Distribution for Industrial Plants

Green Book™— IEEE STD 142™-2007, Recommended Practice for Grounding of Industrial and Commercial Power Systems

Gray Book™— IEEE STD 241™-1990 (R1997), Recommended Practice for Electrical Power Systems in Commercial Buildings

Buff Book™— IEEE STD 242™-2001, Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems

COLOR BOOKS - CONSOLIDATED DESIGN, OPERATIONS AND MAINTENANCE STANDARDS

Brown Book™— IEEE STD 399™-1997, Recommended Practice for Industrial and Commercial Power Systems Analysis

Orange Book™— IEEE STD 446™-1995 (R2000), Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications

Gold Book™— IEEE STD 493™-2007, Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems

Violet Book™— IEEE STD 551™-2006, Recommended Practice for Short-Circuit Calculations in Industrial and Commercial Power Systems

White Book™— IEEE STD 602™-2007, Recommended Practice for Electrical Systems in Health Care Facilities

COLOR BOOKS - CONSOLIDATED DESIGN, OPERATIONS AND MAINTENANCE STANDARDS

Bronze Book™— IEEE STD 739™-1995 (R2000), Recommended Practice for Energy Management in Industrial and Commercial Facilities

Yellow Book™— IEEE STD 902™-1998, Guide for Maintenance, Operation, and Safety of Industrial and Commercial Power Systems

Blue Book™— IEEE STD 1015™-2006, Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems

Emerald Book™— IEEE STD 1100™-2005, Recommended Practice for Powering and Grounding Electronic Equipment

Though Color Books are presently listed as Inactive, people are still purchasing and referencing them.

A FEW ACTIVE IAS PUBLISHED STANDARDS

(Titles are shortened to conserve space)

IEEE 45. 1 - IEEE 45.7: *IEEE Recommended Practices for Electrical Installations on Shipboard*

IEEE 844.1 - IEEE 844.4: *IEEE Standards for Electrical Heat Tracing*

IEEE 1349: *IEEE Guide for Application of Electrical Motors in Hazardous (Classified) locations.*

IEEE 1716: *IEEE Recommended Practice for Managing Natural Disaster Impact*

IEEE 1810: *IEEE Guide for Installation of Fire-Rated Cables Suitable for Hydrocarbon Pool Fires*

IEEE 3002.3: *IEEE Recommended Practice for Conducting Short-Circuit Studies and Analysis*

IEEE 3002.7: *IEEE Recommended Practice for Conducting Motor-Starting Studies and Analysis*

IEEE 3002.8: *IEEE Recommended Practice for Conducting Harmonic Studies and Analysis*

IEEE 3003.1: *IEEE Recommended Practice for System Grounding of Power Systems*

IEEE 3003.2: *IEEE Recommended Practice for Equipment Grounding and Bonding*

IEEE 3004.8: *IEEE Recommended Practice for Motor Protection*

IEEE 3006.5: *IEEE Recommended Practice for the Use of Probability Methods for Conducting a Reliability Analysis*

IEEE 3006.8: *IEEE Recommended Practice for Analyzing Reliability Data for Equipment*

A FEW STANDARDS UNDER DEVELOPMENT

(Titles are shortened to conserve space. Visit IAS standards website for full title and scope)

P45.2: Recommended Practice for Electrical Installations on Shipboard -- Controls and Automation

P2943: Energy Efficiency Test Methods for Three-Phase Variable Frequency Drive Systems

P2969: Guide for Continuous Thermal Monitoring of Switchgear and Motor Control Centers up to 52kV

P3001.9: Recommended Practice for the Design of Power Systems Supplying Lighting Systems

P3002.9: Recommended Practice for Conducting Transient Stability Studies and Analysis

P3003.5: Recommended Practice for Connections to Earth for Alternating Current (AC) Power Systems

P3004.9: Recommended Practice for the Protection of Transformers Used in Power Systems

P3007.3: Recommended Practice for Electrical Safety in Industrial and Commercial Power Systems

P60079-30-1: International Standard - Explosive atmospheres -- Part 30-1: Electrical resistance trace heating - General and testing requirements

P60079-30-2: International Standard for Explosive atmospheres -- Part 30-2: Electrical resistance trace heating -- Application guide for design, installation and maintenance

P61886.3: Subsea Equipment – Part 3: Subsea Motors

IAS STANDARDS – ROLE OF VOLUNTEERS

- **Volunteers are the lifeblood of IAS standards.
All IAS standards are made, reviewed and balloted by the volunteers.**
- **Participation in the standards making working groups get benefits of :
learning from subject matter experts (SMEs) and
mentoring in addressing technical challenges.
SME's get the recognition, and satisfaction, by sharing their skills.**
- **Please join the IAS Standards Working Groups and contribute your skills.**
- **All working group members get their names printed in the published standard and
receive a complimentary copy of the standard.**

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PATRICIA RODER
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SENIOR PROGRAM MANAGER
P.RODER@IEEE.ORG

9 July 2021



AGENDA

- **IEEE and IEEE Standards Association (SA) Overview**
- **IEEE SA Standard Development Process**
- **Current Standards Development Projects in the IAS area**
- **Benefits of Participation**
- **How to Participate**
- **Additional Resources**





ADVANCING TECHNOLOGY FOR HUMANITY

ABOUT IEEE

- 400,000+ Members
- 160+ Countries
- 46 Technical Societies and Councils
- 1900+ Annual Conferences
- Global Humanitarian Efforts



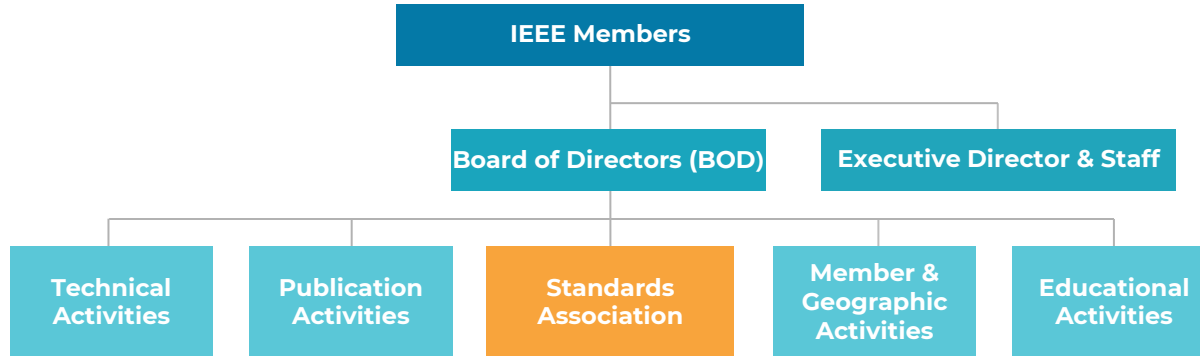
RAISING THE WORLD'S STANDARDS

IEEE SA Overview

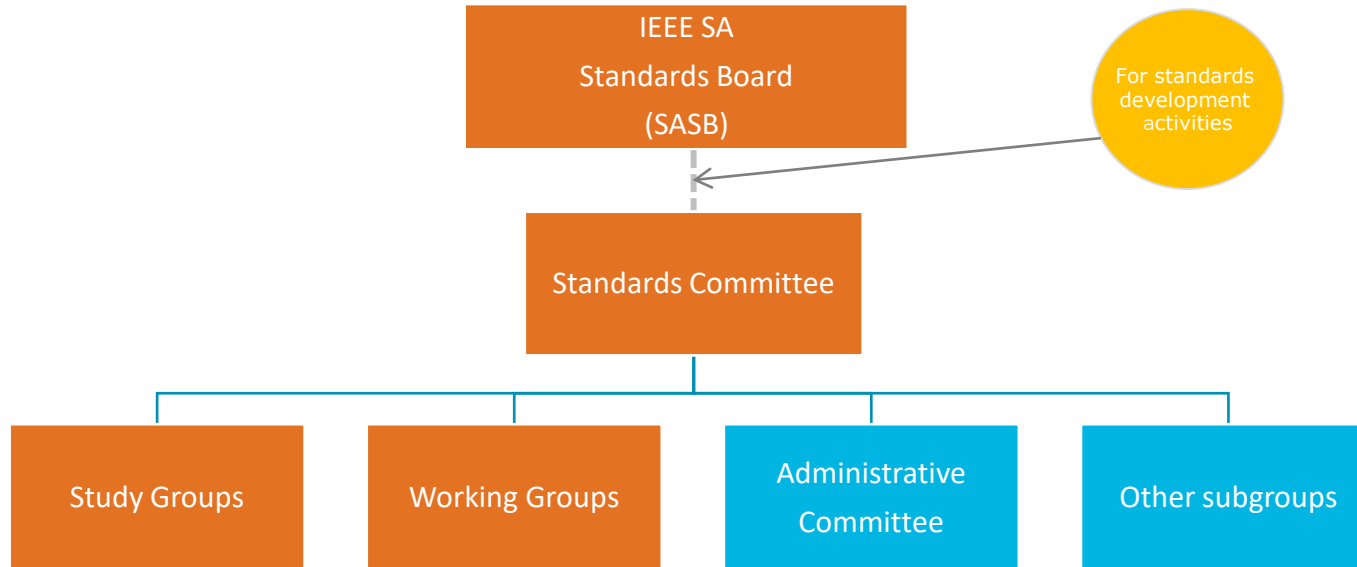
Developing market-relevant open standards and solutions to develop globally recognized standards:

- Advancing global technologies and technology platforms
- Promoting innovation
- Protecting public safety, health, and well-being
- Contributing to a sustainable future

IEEE STANDARDS ASSOCIATION OVERVIEW



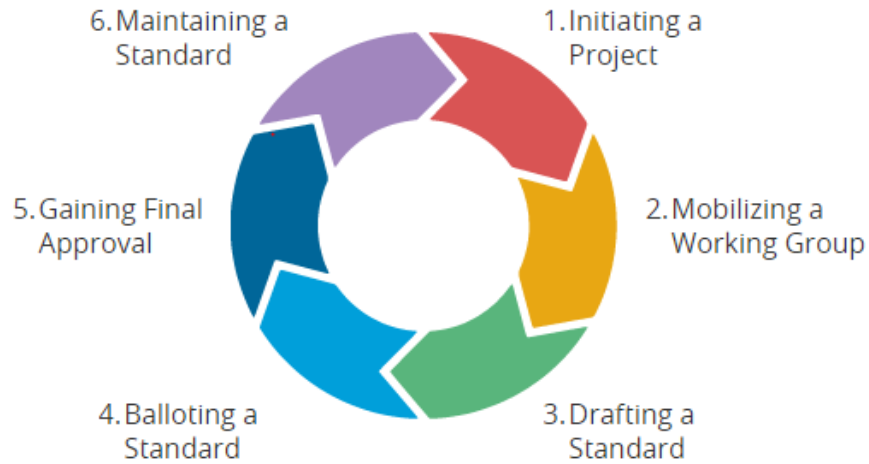
STANDARDS DEVELOPMENT GROUPS





Standards Development Process Overview

STANDARDS DEVELOPMENT LIFECYCLE



TYPES OF IEEE STANDARDS PROJECTS

Standards

- Documents with mandatory requirements
- “Shall” indicates mandatory requirements to be strictly followed without deviation in order to conform to the standard

Recommended practices

- Documents in which procedures and positions preferred by the IEEE are presented
- “Should” indicates a particular recommendation among several possibilities without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required

Guides

- Documents in which alternate approaches to good practice are suggested but no clear-cut recommendations are made
- “May” indicates a course of actions permissible within the limits of a standard
- “Can” indicates possibility and capability

Trial-Use documents

- Publications in effect for not more than three years. They can be any of the categories; standards, recommended practices or guides.
- A draft is usually considered for trial-use status when:
 - The WG feels draft needs input from a broader constituency;
 - The Standards Committee is unable to resolve negative ballots to a satisfactory level, or
 - When the SASB cannot attain a suitable level of approval for a draft submitted for adoption as an IEEE Standard.

CURRENT IAS-RELATED STANDARDS DEVELOPMENT PROJECTS

Project Number	Project Title	Project Status
P62395-1	Electrical Resistance Trace Heating Systems for Industrial and Commercial Applications – Part 1: General and testing requirements	Draft Development
P62395-2	Electrical Resistance Trace Heating Systems for Industrial and Commercial Applications Part 2: Application Guide for system design, installation and maintenance	Draft Development
P3004.9	Recommended Practice for the Protection of Transformers Used in Industrial and Commercial Power Systems	Draft Development
P3003.5	Recommended Practice for Connections to Earth for Alternating Current (AC) Industrial and Commercial Power Systems Facilities	Draft Development
P3002.9	Recommended Practice for Conducting Transient Stability Studies and Analysis of Industrial and Commercial Power Systems	Draft Development
P3007.2	Recommended Practice for the Maintenance of Industrial and Commercial Power Systems	Draft Development
P303	Recommended Practice for Auxiliary Devices for Rotating Electrical Machines in Class I, Division 2 and Zone 2 Locations and Class II, Division 2 and Zone 22 Locations	Draft Development
P3001.3	Recommended Practice for the Design of Industrial and Commercial Power Systems: Voltage Considerations	Draft Development
P2943	Energy Efficiency Test Methods for Three-Phase Variable Frequency Drive Systems	Draft Development
P2964	Standard for Datasheet Parameters and Tests for Integrated Gate Drivers	Draft Development

CURRENT IAS-RELATED STANDARDS DEVELOPMENT PROJECTS

Project Number	Project Title	Project Status
P2969	Guide for Continuous Thermal Monitoring of Switchgear and Motor Control Centers up to 52 kV	Draft Development
P61886.3	Subsea Equipment – Part 3: Subsea Motors	Draft Development
P45.2	Recommended Practice for Electrical Installations on Shipboard -- Controls and Automation	Draft Development
P3001.9	Recommended Practice for the Design of Power Systems Supplying Lighting Systems in Commercial and Industrial Facilities	Draft Development
P841.1	Standard for Process Industry--IE3, Severe-Duty, IP 56 Squirrel Cage Induction Motors--Up to and Including 370 kW	SA Ballot: Comment Resolution
P2455	Recommended Practice for the Repair and Maintenance of Direct Current Electric Machines	Draft Development
P3007.3	Recommended Practice for Electrical Safety in Industrial and Commercial Power Systems	Draft Development
P3007.1	Recommended Practice for the Operation and Management of Industrial and Commercial Power Systems	Draft Development

CURRENT IAS-RELATED STANDARDS DEVELOPMENT PROJECTS

P3006.1	Recommended Practice for Reliability Planning and Design of Industrial and Commercial Power Systems	Draft Development
P60079-30-1	International Standard - Explosive atmospheres -- Part 30-1: Electrical resistance trace heating -- General and testing requirements	Draft Development
P60079-30-2	International Standard - Explosive atmospheres -- Part 30-2: Electrical resistance trace heating -- Application guide for design, installation and maintenance	Draft Development
P61886.2	Subsea Power Transformers	SA Ballot: Pre-Ballot

BENEFITS OF PARTICIPATION

- Enables you to contribute to and influence the development of a standard to drive the functionality, capabilities, and/or interoperability of products and services.
- Provides you with the opportunity to connect with a network of industry experts from a wide range of technical areas.
- Assists you in broadening your understanding of your industry and technology.
- Allows you to gain familiarity with the content of standards in which you are involved—facilitating early compliance and anticipating market requirements.

HOW TO PARTICIPATE

- Participation in an IEEE SA Working Group is open to everyone
- Requirements to gain membership and voting membership are specified in the Standards Committee Policies and Procedures (P&P) or in the Working Group P&P
- IEEE and/or IEEE SA membership are required to:
 - hold a leadership role in the Working Group (such as Chair or Secretary)
 - join the IEEE SA ballot group to ballot on the standard.

See 5.2 Standards-development process of IEEE SA Standards Board Bylaws on membership requirements.

HOW TO PARTICIPATE

- Determine which project you are interested in joining
 - You can search the listing of current standards development projects at [IEEE SA – Projects](#)
 - You can search by keyword or by topic (such as Industry Applications)
- Contact the Program Manager (for IAS, it is me) who will connect you with the Working Group Chair or
- Login to [myProject](#), the system used by IEEE to facilitate the standards development process and express your interest in participating in a project

Need help? Click on the 'Help' icon at the top of the page to view the [myProject User Guide](#). Section 3.1 provides instructions on how to register as an interested party.

You can also watch a tutorial video here:

<https://development.standards.ieee.org/myproject-web/public/view.html#landing>

- Working Chair will be notified and can provide you with the details of the project

***THANK YOU FOR YOUR TIME AND ATTENTION –
I LOOK FORWARD TO WORKING WITH YOU IN
THE FUTURE!***

[HTTP://STANDARDS.IEEE.ORG](http://standards.ieee.org)

