A COMPARISON OF THE IEEE AND IEC STANDARDS PROCESSES

Paper No. PCIC-2002-01

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Abstract – This paper discusses the relevance of standards in a global marketplace. In addition, it outlines the methods used by the Institute of Electrical and Electronics Engineers, (IEEE) and the International Electrotechnical Commission (IEC) standards process, and the rules for standards development including the procedures required to bring a standard to publication.

Index Terms – Standards, Global Standards, Standardization, Standards Process, Standards Documents

INTRODUCTION

Most North American based corporations, in the Petroleum and Chemical Industry utilize in-house standards and specifications that reference IEEE standards. In many cases, the same corporations that are global also reference IEC standards within those same in-house standards. The world is becoming more of a global market place each day, with every additional merger, acquisition, or whatever the current buzzword may be. As corporations become global, the changing face of international trade is leading to the requirement by manufacturers and end-users to have single, globally acceptable technical standards and conformance tests.

In United States, (US) companies, the strategic importance of thinking -- and operating -- globally is illustrated by the increasing use of international standards. According to one estimate, international standards now account for about 45 percent of the standards used by U.S. industry. That's up from about 10 percent in 1970, when the vast majority of standards were in-house corporate specifications and guidelines.

Standards Developing Organizations (SDO), in the U.S such as the IEEE, develop voluntary consensus standards, which means any interested party can participate in the development process, and the outcome is the product of general, though not necessarily unanimous, agreement.

There are approximately 175 such organizations that are engaged in preparing standards at the international level. The International Organization for Standardization (ISO) and the International Electrotechnical Commission, (IEC) has contributed 85% of the existing body of international standards. A survey conducted by American National Standards Institute, (ANSI) found that there are 89,000 standards in the US, 88,000 in the Russian Federation, 18,300 in France, 8,800 in Japan, and 6,000 in Canada [1] This sums up the dilemma facing corporations, one that is becoming more acute in this era of globalization.

In particular the Petroleum and Chemical Industry is experiencing the cost impact of standards on their global operations. Corporations in most if not all industries must choose which standards to adopt and which ones to ignore. They also must be alert to standards that are in the "pipeline." They must determine which standards-development activities warrant their participation and investment because of anticipated impacts on their businesses. Most small and medium-sized firms do not have the option of deciding whether to participate. This is especially true for the activities of an SDO, such as the ISO and the IEC. As a rule, smaller firms cannot afford to participate, except perhaps as members of trade associations or professional societies.

However, regardless of size, firms do not want to be surprised. They do not want to be caught unaware by the emergence of a new standard that affects the marketability of their products, the existing infrastructure of their manufacturing facilities, and the construction of future facilities, at home or in other countries and regions. If this happens, firms may not have the luxury of choosing which standard to use, and they may be forced to follow a path of technology evolution set by others.

Many of you work for a global corporation with manufacturing plants in various countries around the world. More often than not, these corporations are beginning to divide by business segments in lieu of the traditional geographic divisions. Thus, as these business segments have plants in geographic locations in many countries around the world, corporate executives ask their engineers, "Why does each plant built in each country have to be built to a different standard?" That is a very good question, and today the answer would depend on which side of the ocean you stand.

"If only the correct route in the standards maze was marked with a well defined path, the arcane world of standards would not be so alien to USA businesses. However, business executives who fail to recognize that standards impact their business do so at their own company's peril. In today's global marketplace, standards are important competitive tools that can define, limit, and create markets. The shift from national to global markets has made standards an essential component of overall business strategy. Perhaps the dilemma is that there are so many alternatives. The truth is that standards strategy evolves from business strategy and no single approach works best for all situations. The maturity of a market and its traditional standards culture; a company's vision of its competitive edge; and proprietary intellectual property rights (IPRs) all contribute to a company's standards strategy [2]."

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02CH37328

A. *Standards – The Good, The Bad and The Ugly*

The vast number of standards alone suggests that the world needs standards. Without question, The Petroleum and Chemical Industry does. In industry, when widely adopted by companies, good standards:

- Promote market efficiency and expansion.
- Foster international trade.
- Encourage competition and lower barriers to market entry.
- Diffuse new technologies.
- Protect consumers against unsafe or substandard products.
- Enable interoperability among products.

Several corporate executives who employ a standards strategy in corporate strategic planning, and who operate in global markets are attributed with making the following remarks:

"American companies must understand that standardization is a strategic business issue that has a direct impact on new product development. There is a direct relationship between leadership in standards and leadership in technology. American standards bodies must lead the way in international activities," according to George Fisher, CEO of Eastman Kodak in the October 16, 1995 *Business Week* [2].

William J. Hudson, President and CEO of Amp, Incorporated, concluded during his 1995 World Standards Day address: "We must all clearly understand the fundamental law of standards development, which is that standards are never neutral. They reflect the strengths and innovations of those who offer them to the committees. Not participating in standards abdicates the decision-making to the competition whether it be by company or nation [2]."

However, standards are not unequivocally good. Sometimes the distinction between "good" and "bad" standards is not clear. When standards work poorly, they can:

- Raise transaction costs and barriers to trade.
- Constrain innovation and entrench inferior technologies.
- Hinder the development of interoperable systems.
- From the perspective of individual firms, poor or indeterminate standards can raise costs, compromise quality, and constrain market position.

Standards can also get ugly when they erect "technical barriers to trade." Bureaucrats can devise laws or regulations more easily met by local producers than by foreign firms. Markets can depend upon standards controlled by the local industries. Governments can issue procurement specifications that favor individual suppliers.

B. *Benefits of Standardization:*

The benefits realized by the use of international standards can be summarized in terms of tangible and intangible benefits in the following **Table I**.

TABLE I
MAJOR BENEFITS THAT CAN BE ATTRIBUTED TO STANDARDS AND STANDARDIZATION [3]

Tangible Benefits	Intangible Benefits
Reduce cost of specifying parts, materials, processes, and recurring technical requirements.	Reduce time required to get a new design into production.
Reduce paperwork and record-keeping in purchasing, quality assurance, inventory control, etc.	Reduce frequency of technical errors of judgment.
Obviate the need for qualification testing of product.	Provide a common language between design and manufacturing, that is, buyers and sellers.
Reduce capital investment in inventory, warehouse, and special equipment.	Increase productivity and efficiency in manufacturing.
Reduce warehouse-operating costs.	Improve quality based on accepted and explicit specifications.
Develop cost estimates more economically.	Improve reliability through consistency from process rationalization and repetition.
Reduce the time required to train the persons or vendors using the standards.	Improve user and customer confidence.

C. *Costs of Standardization*

The benefits listed in **Table I** also have associated costs. Some of these cost factors are intangible and cannot be readily quantified in terms of money and manpower. If we credit standardization with the benefits summarized in **Table I**, we should also be aware of the costs associated with them. These costs are summarized in **Table II**.

TABLE II
COST FACTORS THAT CAN BE ATTRIBUTED TO STANDARDS AND STANDARDIZATION [3]

Tangible Cost Factors	Intangible Cost Factors
Arriving at a decision on appropriate standardization action includes several consensus meetings held between the prime players in this action.	Constraining the freedom of choice.
Documenting the standardization action.	Restricting innovation, particularly in design.
Implementing and enforcing the action.	Providing common denominator solutions that may be optimized for current needs.
Operating the standards program.	Weakening a company's position in the marketplace by standardization features that had differentiated the company's products.
Maintaining the internal standards.	Simplifying entry of competitors into a market where user requirements have been defined by standards.
Monitoring and participating in the external standardization activities.	Continuing use of obsolete standards because of industry inertia.
Marginally increasing the cost for some items.	

IEEE STANDARDS DEVELOPMENT PROCESS

Before describing the IEEE standards development process it is important to realize that standards may become legal requirements when adopted by government or regulatory agencies. For example, test requirements in IEEE standards often become the basis for approval testing by Nationally Recognized Testing Laboratories (NRTLs). Due to the legal ramifications of standards, there are five principles that drive the IEEE standards process [4]. They are (1) due process, (2) openness, (3) consensus, (4) balance, and (5) right of appeal. The application of these principles will be addressed in the following presentation in the development process section in which they apply. It is also important to realize that there are different types of IEEE standards.

A. Types of Standards Documents

There are three types of classifications of IEEE standards: Standard, Recommended Practice, and Guide. These differ in the degree or level of requirement specified in the document. Standards primarily contain mandatory requirements. The text will typically use the verb "shall". A Recommended Practice will contain a suggested approach or procedure. The verb "should" is most common. A Guide, as the name implies, provides guidelines, and the verb "may" is frequently used. Note that the verb "may" or "should" can appear in a Standard. The key criterion is the preponderance of the usage. For example, if a document contains primarily "shoulds" and has some "shalls", it would most appropriately be called a Recommended Practice and the "shalls" can remain in the document.

As a Guide or Recommended Practice (RP) is used and industry refines its understanding of the procedures, subsequent revisions of the Guide or RP may increase the level of requirement. That is, a Guide may become a RP or a RP, a Standard.

B. How a standard is initiated.

An individual or group, typically an IEEE committee or sub-committee, decides that a standard is needed that would provide uniformity, technical knowledge, or additional safety for their industry. The first step is to find a sponsor in one of the IEEE technical societies such as IAS/PCIC (Industrial Applications Society/Petroleum & Chemical Industry Committee) or PES/TC (Power Engineering Society/Transformer Committee). The sponsor takes responsibility for the technical content of the standard. Therefore there must be interest and technical competence within the sponsor's organization to develop and review the document. Once an IEEE sponsor has been identified, the next step is to fill out a Project Authorization Request (PAR) and submit it to the IEEE Standards Board.

C. What is a PAR?

A PAR is the formal document that initiates a standards project. This document addresses the need for a project and what it intends to accomplish. Key elements of the PAR form are:

1. The proposed title
2. The sponsor
3. The individual that will be responsible for the effort (the working group Chair)
4. The scope of the standard (*what it will cover*)
5. The purpose of the standard (*why the standard*),
6. Identification of intellectual property in the form of patents or copyrights

Please refer to **"ATTACHMENT A,"** cover page of IEEE PAR form [5].

Once completed, the PAR is then submitted to the New Standards Committee (NesCom). NesCom is a committee of the IEEE-Standards Association (SA) Standards Board, responsible for making sure the PAR forms have been completed properly. There must be a sponsor and a Chair to direct the project. Note that as of 2000 all Chairs of working groups must be IEEE-SA members. It is also important that the title, the scope and the purpose accurately describe the work to be done. The normal procedure has been to submit the PAR to NesCom 40 days before the quarterly IEEE Standards Board meetings. However, to provide faster turn around on PARs, IEEE-SA has implemented Continuous Processing, which provides for the review of a PAR via teleconferencing by NesCom in between the IEEE Standards Board meetings. Thus, review of PARs by NesCom now occurs eight times a year, reducing the time for approval. Once NesCom approves the PAR, the project is officially recognized by the IEEE-SA, and work may begin. The time that is normally granted to complete a standard is four years from the approval date of the PAR.

D. Operation of the Working Group

The development of a standard takes place in a Working Group (WG), which has been established by due process. In IEEE, a WG usually consists of individuals representing various aspects of the application or subject matter. The WG Chair must possess a working knowledge of "Robert's Rules of Order" and the policies and procedures of the IEEE-SA Standards Board. WG membership typically includes manufacturers, users, consultants and sometimes agencies. It is important to note that under the principle of *Openness*, anyone may attend a WG meeting. Further to be a WG member does not require IEEE membership.

Along with the principle of *Openness*, there are requirements developed by the sponsor for being recognized as a WG member. Due process also applies to procedures for bringing up issues, debating issues, voting on issues, and publishing meeting minutes and meeting announcements.

The basic steps for a WG to develop a standard are (1) Understand the scope and purpose as written on the PAR, (2) Examine related standards and publications, (3) Determine "state-of-the-art," (4) Draft an outline, (5) Add the text, and (6) Finalize the document. Rather than trying to generate the text during the WG meeting, sections are often assigned to individuals within the WG. The proposed text for the various sections is discussed, sometimes modified, and then accepted for the draft. A vote is taken and if there is agreement among the majority of voting WG members, then the proposed text or modification there of is accepted and incorporated into the draft. Note, as determined by the

procedures of the sponsor or WG, an informal vote or ballot can be conducted within the WG prior to the formal balloting process.

When all elements of the outline have been completed, the document then becomes a final draft ready for balloting. Note that 100% approval of the WG or unanimity is not required.

E. Balloting

The first step is to establish a balloting group. Most sponsors have a pre-established balloting group or rules on forming one. The IEEE Standards Association Standards Board (SASB) has the requirement that members of a balloting group must be members of the IEEE-SA. In addition, in forming the balloting group the principle of *Balance* is required. The potential balloters are placed into the following categories: user, producer, general interest, and additional categories as needed. To meet the *Balance* criterion, no one category may be more than 50% of the balloting group. Note that the *Balance* criterion was not applied to voting within the WG in forming a consensus.

Once the balloting group is formed the balloting process can begin. In most cases, balloting for IEEE standards is done electronically. The time frame for balloting is usually 30 to 60 days. There are three options for a balloter: approve, disapprove, or abstain. An approve (affirmative) ballot can include comments. A disapprove (negative) ballot should have comments to explain the reason for disapproval, which will also serve as a starting point for resolution.

The *Consensus* principle applies to balloting as well. IEEE **requires** a minimum of 75% return of the ballots and a 75% approval rate from those returned. Once the 75% return criterion has been met, the WG has the responsibility to consider all comments and incorporate them into the document, if they think it would improve the standard. If comments that are technical in nature are adopted, a re-circulation ballot to the same balloting group will be necessary. Comments that are deemed editorial in nature may be incorporated without any further balloting.

An attempt must be made to resolve all negative ballots. This can be accomplished if the negative balloter agrees to change his/her ballot to approve after some further explanation. It can also be accomplished by changing the draft to satisfy the negative balloter's objection. However, if the change is technical or substantive, a re-circulation ballot is required. The negative ballot along with the comments for the negative ballot is sent to the original balloting group. To facilitate the re-circulation balloting process, the time duration is only 10 days, and a non-response by a balloter reverts back to his or her position on the original ballot.

When the comments have been addressed, any necessary re-circulation ballot has taken place, and the 75% approval criterion is met, the final draft and supporting material is submitted to the Review Committee (RevCom). RevCom is a committee of the IEEE SASB. RevCom reviews the submittal to make sure that the principles of *due process; openness*, *consensus*, and *balance* have been followed. RevCom then issues a recommendation to approve, which is then ratified by the IEEE SASB. The standard is then published.

The final imperative principle required in the development process is the *Right of Appeal*. An appeal may be made at any point in the process. If the appeal occurs before the IEEE SASB approves the standard, it is given to the sponsor to address. If the appeal is made after the standard is approved, it is addressed directly by the IEEE SASB.

F. Maintenance of an IEEE standard

IEEE standards are valid for five years. Then one of three outcomes takes place: reaffirmation, revision, or withdrawal. A standard is reaffirmed if the technical content is still valid and there are no changes needed. If changes are required to keep the standard current or useful, a PAR is initiated to set-up a Working Group to revise the standard. If a standard has served its purpose and is no longer needed, the standard may be withdrawn.

THE IEC STANDARDS PROCESS

The IEC process is characterized by country membership. The approximately 62 member countries are listed in "**ATTACHMENT B** [6]." Some 200 Technical Committees (TC) and Subcommittees (SC), and some 700 working groups carry out the standards work of the IEC. The technical committees prepare technical documents on specific subjects within their respective scopes. Of particular interest to IEEE and PCIC members and conference attendees is TC31.

The scope of TC31 is "To prepare international standards regarding electrical apparatus for use where there is a hazard due to the possible presence of ignitable gas, vapor, liquid particles or dust in the atmosphere." The output of the TC's, SC's and WG's is submitted to the full IEC country members, "National Committee (NC)," for voting with a view to their approval as international standards

A TC is made up of National Committees representatives, all of who are free to take part in the work of any given TC. If a TC finds that its scope is too wide to enable all the items on its work program to be dealt with, it may set up SCs, defining in each case a scope covering part of the subjects dealt with by the main committee. The SCs' report on their work to the parent TC.

Secretariats for TC's are assigned to a Participating (P)-member NC by the Standards Management Board (SMB).

A chairman of a TC is proposed by the secretariat and appointed by the SMB. The term of office of a TC chairman is six years, with the possibility of renewal by periods of three years.

A chairman of an SC is appointed by the parent TC on proposal by the secretariat of the SC. His/her term of office is six years, with the possibility of renewal by periods of three years.

Any NC accepting responsibility for the secretariat of a TC or SC undertakes to make all efforts to ensure rapid completion of the work. The ISO/IEC Directives and the Guidance for TC/SC Secretaries define the responsibilities of the NC assuming TC or SC secretariats.

In the United States, a Technical Advisory Group (TAG) is assigned for each IEC Technical Committee. The leader of the TAG is a Technical Advisory (TA). The TAG reviews the positions and actions of its TC and makes recommendations

to the United States National Committee of the IEC (USNC) for voting.

To draft documents for new standards, a TC or SC sets up a project team. For maintaining or modifying standards, the TC establishes a maintenance team. Each are composed of a limited number of experts appointed by the P-members of the TC. (A TC comprises P members, who are obliged to attend meetings and vote on documents. Observer (O) members may attend TC meetings as observers, but do not have a vote.

Each member of a project team acts as an individual expert and not as a representative of his/her NC. The project leader of a project team is nominated by the proposer (NC) of the work. Project leaders are responsible for ensuring that all working drafts are produced on time. Upon completing its task, the project team is disbanded.

A. Languages

The three official languages of the IEC are English, French, and Russian. In all bodies of the IEC other than the Council, discussions may be held in English and/or French, following agreement among the delegates [7].

B. Preliminary stage

This comprises projects envisaged for the future but not yet ready for immediate development into full IEC Standards. This preliminary work could be to establish better definition of a project for new work, data collection or round-robin tests necessary to develop standards, which is not part of the standardization process.
At this stage, a Publicly Available Specification (PAS) can be prepared and submitted through an approval process that takes two months [7].

C. Proposal stage

A proposal for new work generally originates from industry via a NC. It is communicated to the members of the appropriate TC or SC accompanied by a New Work Proposal. See "**ATTACHMENT C** [8]." From a practical point of view in the US, a New Work Proposal is submitted to the TA. The TA will then review the New Work Proposal with the TAG and make a recommendation to the USNC. The USNC will then submit the New Work Proposal to the specific TC Secretary through the IEC central office in Geneva. A simple majority vote of the TC or SC members on the interest of studying the proposal takes place within three months. If the result is positive and a minimum of four members or 25% of the P-members whichever is greater, undertake to participate actively in the work and nominate experts, it is included in the work program of the TC, together with a project plan including target dates [7].

D. Preparatory stage

During this phase, a Working Draft (WD) is generally prepared by a working group and its' project leader, or convener [7].

E. Committee stage

At this point the document is submitted to the NCs' as a Committee Draft (CD) for comment.

F. Enquiry Stage

Before passing to the approval stage, the bilingual Committee Draft for Vote (CDV) is submitted to all National Committees for a five-month voting period. It is the last stage at which technical comments can be taken into consideration. The CDV is considered as approved if:

- a majority of two thirds of the votes cast by P-members is in favor, and if
- the number of negative votes cast by all NCs' does not exceed one quarter of all the votes cast.

**When it is planned that the document will become a Technical Specification (and not an International Standard), only the first criterion concerning two thirds of the votes needs to be fulfilled, and the revised version is then sent to Central Office to be published [7].*

G. Approval Stage

The Final Draft International Standard (FDIS) is then circulated to the NCs' for a two-month voting period. Each NCs' vote must be explicit: positive, negative or abstain.

An FDIS is approved if:

- a majority of two thirds of the votes cast by P-members is in favor, and if
- the number of negative votes cast by all NCs' does not exceed one quarter of all the votes cast.

If the document is approved, it is published. If the document is not approved, it is referred back to the TC or SC to be reconsidered [7].

H. The Role of the World Trade Organization

The original General Agreement on Tariffs and Trade, now referred to as GATT 1947, provided the basic rules of the multilateral trading system from 1 January 1948 until the World Trade organization (WTO) entered into force on 1 January 1995.

The WTO is the only international organization dealing with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible [9].

At the heart of the system – known as the multilateral trading system – are the WTO's agreements, negotiated and signed by a large majority of the world's trading nations, and ratified in their parliaments. These agreements are the legal ground-rules for international commerce. Essentially, they are contracts, guaranteeing member countries important trade rights. They also bind governments to keep their trade policies within agreed limits to everybody's benefit.

The agreements were negotiated and signed by governments. But their purpose is to help producers of good and services, exporters, and importers conduct their business.

I. The WTO and Standards

The WTO, had its second triennial review of the operation and implementation of the agreement on technical barriers to trade. The WTO published the following decision of the committee on principles for the development of international standards, guides and recommendations. The following principles and procedures should be observed, when international standards, guides and recommendations are elaborated; to ensure transparency, openness, impartiality and consensus, effectiveness and relevance, coherence, and to address the concerns of developing countries. These principles are clearly outlined in the IEC and IEEE processes [9].

HARMONIZATION

There is ongoing debate as to whether or not the international organization model resting on an infrastructure of national member bodies is responsive to some industry sectors in the United States. Some sectors have problems securing international acceptance of US positions. The US viewpoint (with one vote) is sometimes overborne by the European viewpoint (with 15 votes), and these sectors end up with international standards with which they do not agree and which they cannot meet.

Harmonization of national and international standards is a positive complement to other global trends and developments. The volume of world merchandise trade has increased sixteen-fold since 1950. In recent years, it has grown at double-digit rates, faster than most national economies. In addition, 60 percent of today's world trade is conducted between countries committed to regional free trade arrangements.

A. THE IEC AND IEEE WORKING TOGETHER???

The parallel flow charts, Fig. I, outline the similarities in the process of the IEEE and the IEC. Yes, there has been and there may be for some time duplication in the standards development process. Today, there is not a cooperative arrangement by which an IEEE and IEC TC can work directly together. An IEEE standards group can have a Category D Liaison with specific activities of an IEC TC. If an IEEE standards TC wishes to have its standards development work considered by its counterpart in the IEC, it must do so through an NC. In the United States, the NC is the United States National Committee (USNC), a committee of the American National Standards Institute (ANSI). As this paper is being prepared, the NCs' of the IEC have approved dual logo standards. This is another step in moving toward harmonization, a slow and sometimes painful process.

Options for Development of an IEC Project

Simplified diagram of options

Project Stage	Normal procedure	Draft submitted with proposal	"Fast-track procedure"	Technical Specification	Technical Report	Publicly Available Specification
Proposal Stage	Acceptance of proposal	Acceptance of proposal	Acceptance of proposal	Acceptance of proposal		Acceptance of proposal
Preparatory stage	Preparation of working draft	Study by working group		Preparation of draft		
Committee stage	Development and acceptance of committee draft	Development and acceptance of committee draft		Development and acceptance of draft	Acceptance of draft	
Enquiry stage	Development and acceptance of enquiry draft	Development and acceptance of enquiry draft	Acceptance of enquiry draft	Development and acceptance of draft	Acceptance of draft	
Approval stage	Approval of FDIS	Approval of FDIS	Approval of FDIS			Approval of draft PAS
Publication stage	Publication of International Standard	Publication of International Standard	Publication of International Standard	Publication of Technical Specification	Publication of Technical Report	Publication of PAS

The IEEE Standards Development Process

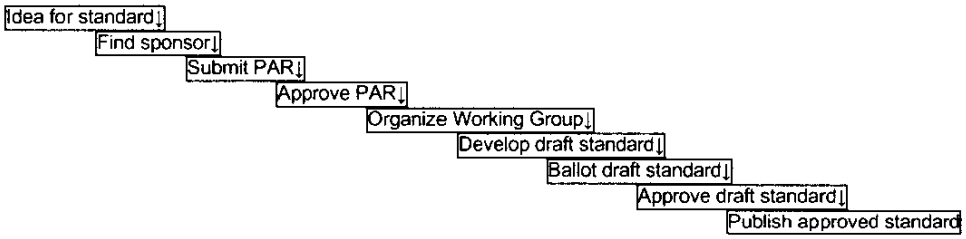

Fig. I

CONCLUSION

The processes for standards development in the IEEE and IEC are established, and the impact on industry has been demonstrated.

Clearly, a cooperative effort of the IEEE and IEC will benefit industry. There are many hurdles ahead to facilitate closer cooperation. Industries can be an effective facilitator by asking their governments to encourage a cooperative atmosphere.

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VITAE

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Donald G. Dunn received a BSEE, in 1991 from Prairie View A&M University and in 1993 attended West Texas A&M University pursuing an MBA. He was employed by Diamond Shamrock from 1992 to 1998 as an Instrument, Electrical & Control System Engineer and worked on many diverse capital projects. Since 1998, he has been employed by Equistar Chemicals as a Senior IEA & Controls Engineer at the Channelview Complex. He is currently a senior member of the IEEE and the ISA. He has been a member of the IEEE for the past 15 years. He has co-authored one paper for PCIC. He is the past chairman of the PCIC young engineers development subcommittee and a member of several other subcommittees. Mr. Dunn is currently the Secretary of the Chemical Subcommittee. He is a member of the IEEE Standards Association, IEEE 1242 Working Group and ISA Standards Committees SP3, SP5.6, & SP60.

Richard H. Hulett received a BSME in 1964 and an MSME in 1965 from Stanford University. He is the Senior Vice President of Electrical Products for Thermon Manufacturing Company, where he has been employed for 10 years. He was previously employed by Raychem for 20 years. He has been a member of the IEEE and the IEEE/IAS/PCIC for the past 25 years. He is currently a member of the IEEE Standards Board. As a member of PCIC, he has been on the Standards Subcommittee (where he has served as chair) from 1993-present. He has been a member of the IEEE 515 Working Group since 1979 (where he has served as Chair), since 1985. He is also a member of the Codes and Regulations Working Group and the Chemical Subcommittee. Mr. Hulett is a member of the American Society of Mechanical Engineers since 1964. He has received the David C. Azbill Award and the IEEE Standards Medallion. He has authored numerous papers, and has received Honorable Mention for two papers presented at the IEEE/PCIC Conference.

ATTACHMENT A
IEEE-SA STANDARDS BOARD
PROJECT AUTHORIZATION REQUEST (PAR) FORM (2002)

The submittal deadlines for the year 2002 is available.
For a review of the Standards Development Process (designed to assist the Working Group, Working Group Chair, Sponsor Chair, and Society Liaison), please check here. [Yes]

1. ASSIGNED PROJECT NUMBER (Please leave blank if not available) P[ ]

2. SPONSOR DATE OF REQUEST [ ] (YYYY-MM-DD format)

3. TYPE OF DOCUMENT (Please check one)

[Standard] **Standard for** {document stressing the verb "shall"}

[Recommended] **Recommended Practice for** {document stressing the verb "should"}

[Guide] **Guide for** {document in which good practices are suggested, stressing the verb "may"}

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4. TITLE OF DOCUMENT: Draft

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5. LIFE CYCLE

[Full] **Full-Use**

[Trial] **Trial-Use**

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6. TYPE OF PROJECT

[New] New standard

[Revision] Revision of an existing standard (indicate Number and year existing standard was published in box to the right):

[Amendment] Amendment to an existing standard (indicate Number and year existing standard was published in box to the right): [ ] (####-YYYY)

[Corrigendum] Corrigendum to an existing standard (indicate Number and year existing standard was published in box to the right):

[Revised] Revised PAR (indicate PAR Number and Approval Date here: P[ ]-[ ] YYYY-MM-DD)

Is this project in ballot now? [Yes] Yes [No] No

State reason for revising the PAR in Item #18.

ATTACHMENT B

IEC MEMBERSHIP BY COUNTRY

http://www.iec.ch/cgi-bin/procgi.pl/www/iecwww.p?wwwlang=e&wwwprog=membrs3.p

Members

ARGENTINA
AUSTRALIA
AUSTRIA
BELARUS
BELGIUM
BOSNIA & HERZEGOVINA Associate Member
BRAZIL (Reinstated: 1st December 2000)
BULGARIA
CANADA
CHINA
COLOMBIA Associate Member
CROATIA
CYPRUS Associate Member
CZECH REPUBLIC
DENMARK
EGYPT
ESTONIA Associate Member
FINLAND
FRANCE
GERMANY
GREECE
HUNGARY
ICELAND Associate Member
INDIA
INDONESIA
IRAN
IRELAND
ISRAEL
ITALY
JAPAN
KOREA (REPUBLIC OF)
LATVIA Associate Member
LITHUANIA Associate Member
LUXEMBURG
MALAYSIA
MALTA Associate Member
MEXICO
NETHERLANDS
NEW ZEALAND
NORWAY
PAKISTAN
PHILIPPINES, REP. OF THE
POLAND
PORTUGAL
ROMANIA
RUSSIAN FEDERATION
SAUDI ARABIA
SINGAPORE
SLOVAKIA
SLOVENIA
SOUTH AFRICA
SPAIN
SWEDEN
SWITZERLAND
THAILAND
TUNISIA Associate Member
TURKEY
UKRAINE
UNITED KINGDOM
UNITED STATES OF AMERICA
YUGOSLAVIA

ATTACHMENT C
NEW WORK PROPOSAL

[Document reference]

NEW WORK ITEM PROPOSAL

http://www.iec.ch/contents.htm

Form NP.dot

Classification according to IEC Directives Supplement, Table 1

Proposer	Date of proposal
TC/SC	Secretariat
Date of circulation	Closing date for voting

A proposal for a new work item within the scope of an existing technical committee or subcommittee shall be submitted to the Central Office. The proposal will be distributed to the P-members of the technical committee or subcommittee for voting, and to the O-members for information. The proposer may be a National Committee of the IEC, the secretariat itself, another technical committee or subcommittee, an organization in liaison, the Committee of Action or one of the advisory committees, or the General Secretary. Guidelines for proposing and justifying a new work item are given in ISO/IEC Directives, Part 1, Annex C (see extract overleaf). **This form is not to be used for amendments or revisions to existing publications.**

The proposal (to be completed by the proposer)

Title of proposal

☐ Standard	☐ Technical Specification

Scope (as defined in ISO/IEC Directives, Part 2, 6.2.1)

Purpose and justification, including the market relevance and relationship to Safety (Guide 104), EMC (Guide 107), Environmental aspects (Guide 109) and Quality assurance (Guide 102) . (attach a separate page as annex, if necessary)

Target date	for first CD	for IS .....
Estimated number of meetings	Frequency of meetings per year	Date and place of first meeting: .....
Proposed working methods	☐ E-mail	☐ ftp

Relevant documents to be considered

Relationship of project to activities of other international bodies

Liaison organizations	**Need for coordination within ISO or IEC**

Preparatory work

Ensure that all copyright issues are identified.Check one of the two following boxes

☐ A draft is attached for vote and comment ☐ An outline is attached

We nominate a project leader as follows in accordance with ISO/IEC Directives, Part 1, 2.3.4 (name, address, fax and e-mail):

Concerns known patented items (see ISO/IEC Directives, Part 2) ☐ yes ☐ no If yes, provide full information as an annex	**Name and/or signature of the proposer**

Comments and recommendations from the TC/SC officers corresponding Sector Board		
1) Work allocation ☐ Project team	☐ New working group	☐ Existing working group no:
2) Draft suitable for direct submission as ☐ CD	☐ CDV	
3) General quality of the draft (conformity to ISO/IEC Directives, Part 2) ☐ Little redrafting needed	☐ Substantial redrafting needed	☐ no draft (outline only)
4) Relationship with other activities In IEC In other organizations		
Other remarks **Remarks from the TC/SC officers**		
Remarks from the Sector Board		

Elements to be clarified when proposing a new work item

Title Indicate the subject matter of the proposed new standard.

Indicate whether it is intended to prepare a standard, a technical report or an amendment to an existing standard.

Scope Give a clear indication of the coverage of the proposed new work item and, if necessary for clarity, exclusions.

Indicate whether the subject proposed relates to one or more of the fields of safety, EMC, the environment or quality assurance.

Purpose and justification Give details based on a critical study of the following elements wherever practicable.

a) The specific aims and reason for the standardization activity, with particular emphasis on the aspects of standardization to be covered, the problems it is expected to solve or the difficulties it is intended to overcome.

b) The main interests that might benefit from or be affected by the activity, such as industry, consumers, trade, governments, distributors.

c) Feasibility of the activity: Are there factors that could hinder the successful establishment or general application of the standard?

d) Timeliness of the standard to be produced: Is the technology reasonably stabilized? If not, how much time is likely to be available before advances in technology may render the proposed standard outdated? Is the proposed standard required as a basis for the future development of the technology in question?

e) Urgency of the activity, considering the needs of the market (industry, consumers, trade, governments etc.) as well as other fields or organizations. Indicate target date and, when a series of standards is proposed, suggest priorities.

f) The benefits to be gained by the implementation of the proposed standard; alternatively, the loss or disadvantage(s) if no standard is established within a reasonable time. Data such as product volume of value of trade should be included and quantified.

g) If the standardization activity is, or is likely to be, the subject of regulations or to require the harmonization of existing regulations, this should be indicated.

If a series of new work items is proposed, the purpose and justification of which is common, a common proposal may be drafted including all elements to be clarified and enumerating the titles and scopes of each individual item.

Relevant documents List any known relevant documents (such as standards and regulations), regardless of their source. When the proposer considers that an existing well-established document may be acceptable as a standard (with or without amendments), indicate this with appropriate justification and attach a copy to the proposal.

Cooperation and liaison List relevant organizations or bodies with which cooperation and liaison should exist.

Preparatory work Indicate the name of the project leader nominated by the proposer.