SB3/89/INF

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SECTOR BOARD 3: INDUSTRIAL AUTOMATION SYSTEMS

Meeting: date: 2002-11-05; place: Paris, France; time: 9:00

SUBJECT **Agenda item 4.1**

Definitive version of the '*Strategic principles for future IEC and ISO standardization in industrial automation*', for final check by Sector Board 3

BACKGROUND

In 1999 the SMB (then the Committee of Action) approved the first version of the enclosed document (see CA/1453/QP and CA/1513/RV). Comments were submitted by SMB and CAB members, and other comments have since been received from ISO TMB. Given the importance of the document for industrial automation standards-making, SB 3 has twice revised the contents taking all comments into account.

Finally, the remaining comments were incorporated into a draft produced by the SB 3 Secretary and distributed to SB 3 members and guests for comments on 2002-09-29. No comments, except for two supporting the draft as presented, have been received.

This is the definitive version submitted to the 2002-11-05 SB 3 meeting for a final check.

ACTION

This is for discussion and final acceptance at the Nov. 2002 SB 3 meeting.

2002-11

Strategic principles for future IEC and ISO standardization in industrial automation

Presented by IEC Sector Board 3 (SB 3), *Industrial automation systems*

Final revision incorporating comments from IEC SMB, IEC CAB and ISO TMB members

Foreword

Two elements of this document require brief comment:

- "Strategic principles" are not the only content of this paper. A first list of actions designed to implement the principles is also proposed.
- "Future ... standardization" indicates that these proposals are forward-looking. However, existing standards are also affected.

SB 3's terms of reference and the experience of its members both restrict the formal domain of these recommendations to that of industrial automation. However, the members are of the unanimous opinion that the recommended principles could have much wider application because many of them are generic, and could thus be relevant to many other industrial sectors.

1 Introduction

Not all standards-related documents (referred to in what follows by the generic term "standards"[1]) have the same purpose or the same consequences, or are subject to the same constraints. For example, a standard that facilitates business in an application domain and a standard defining safety requirements have little in common. Therefore the relevant strategic principles may vary, depending upon the different *segments* into which standards fall.

It is therefore proposed to segment standards according to three criteria: the *purpose*, the *actors concerned*, and the *technology involved*.

Concerning **purpose**, the grouping could be:

- safety and/or compatibility;
- interoperability;
- performance; and
- comprehension and/or best practices.

Concerning the **actors**, one may distinguish:

- governmental, representing the interests of the country and the public; and
- end-users, vendors and integrators organized in a supply chain.

Concerning the **technology involved**, the distinguishing factor is rate of change (fast or slow):

- intensive use of information technology, IT (or other fast-changing technologies); or
- no or limited use of IT (or any other fast-changing technology).

By combining the above elements, one arrives for the purposes of this document at a *segmentation of standards*, shown in the table below.

[1] The term "standard" as used in this document thus includes publications which are not necessarily full consensus documents.

Standards segmentation		
Segment	**Types of "standards"**	**Comments**
Segment 1:	Safety, functional safety and/or compatibility oriented	Will incorporate more and more IT techniques applied to automation. Should be objectives-oriented rather than methods/techniques-oriented
Segment 2:	Fast-changing technologies	Include technologies such as IT, telecom, power electronics, wireless communications, as applied to the automation and control world
2a:	Interoperability-oriented	As technology changes, standards should focus on methods and functions
2b:	Performance-oriented	
Segment 3:	Mature technologies, Performance or Interoperability oriented	Example 1: performance-oriented standards: defining appropriate frameworks enabling evaluation of products against requirements Example 2: electromechanical products: electrical compatibility, mechanical compatibility
Segment 4:	Engineering recommendations	

The main purpose of the segmentation is to provide the context for obtaining “standards” or other IEC/ISO products quickly that may have a short lifetime.

Segment 1 standards generally involve governmental actors as well as market players. The role of certification is very important for market access.

Segment 2a standards need to be global and stable over time because their effectiveness depends on their use by suppliers, integrators *and* end users.

Segments 2b and 3 standards are in a sense private between vendors, or between vendors and users.

Segment 4 standards are not true standards but a collection of best practices that can be used as a reference. There will be little consideration of segment 4 in this document.

After clauses 2 and 3 below, which provide the background and rationale for these recommendations, clause 4 gives recommendations common to all standards segments, and clauses 5 to 7 give ones specific to segments 1, 2 and 3 respectively. Clause 8 deals with conformity assessment, and clause 9 provides a first, evolving list of actions.

2 New environment

The industrial world has changed greatly since the process of standards-writing began. The **new environment** is characterized by:

2.1 Globalization

Elements of society are becoming increasingly interdependent on a global basis. Globalization in industrial automation systems implies standardization across global supply and knowledge chains, involving extended enterprises.

2.2 Spread and dynamism of information technologies

The amount and complexity of the knowledge inherent in industrial products and services have increased by several orders of magnitude. This knowledge (technology) is changing and invading new domains faster than the time needed for a set of independent parties to develop a single, proven interface specification for interoperability across their respective system elements in the traditional standardization process.

2.3 Rapid innovation in other technologies

These include materials processing, energy generation & storage, and bio/ecosystem management and control.

2.4 Systems

While a need remains for the standardization of individual elements using both traditional and advanced technologies, there is increasing emphasis on the ability to integrate elements into systems of varying complexity. These integrated systems are further expected to be sustainable, portable, dependable and scalable.

2.5 Exploitation in other sectors

Many traditional standards groups are seeking to deliver digital definitions of the products that are the subject of their standards. Industry demands a consistent approach across these groups, which should be encouraged to utilise the existing industrial automation standards to develop such definitions.

2.6 Various market demands

Conflicting needs are often expressed by users of products: on the one hand, there is an increasing interest in the use of standards to enable free choice among an ever-greater diversity of more and more complex products—which implies that these products must match all the interfaces required by the user's automation system; on the other hand, there is a trend towards requiring more responsibility from the system integrator, ranging from efficient integration to a guarantee of performance, dependability and results

2.7 Various vendor answers

Producers no longer require uniformity for their very survival; instead, competitive forces determine survival. However, while smaller market actors (e.g. product specialists) require standards for better interoperability and interchangeability, larger ones targeting the system market are less interested in opening up the architectures they have invested in, and more interested in differentiation.

2.8 Various system integrator answers

The needs of system integrators may also be divergent: using proprietary specifications may help deliver cost-effective one-stop-shop, turnkey solutions (as well as protect a competitive position), whereas the use of widely applied international standards allows better management of risks. Overall, the challenge is to find solutions which benefit *all* stakeholders.

2.9 Liberalization

Many areas which used to form the subject of government monopolies or closed oligopolies (telecommunications, air transport, energy) no longer do so; almost all markets are open and competitive. This liberalization is an enabler of the globalization mentioned in 2.1 above.

2.10 Changing relationships between governments and Standards Development Organizations (SDOs)

In more and more countries, SDOs are no longer under government control, but delegated to associations with the public and the private sector represented. This is partly thanks to confidence in the results obtained by ISO and IEC in the past.

Industry as a producer of goods and services ("producers"), no matter how capital-intensive or how advanced technologically, requires less government leadership than it once did, while still welcoming government support.

Some regional economies and their governments continue to use regional or national standards as a basis for technical barriers to trade.

Producers and exporters are seeking for regulation and conformance to standards to be less and less governmental and more and more self-regulatory functions. Small producers and users are concerned that this may result in a new kind of central force controlling the markets, jeopardising broader societal interests.

3 Evolution of requirements

This new environment leads to the following concrete **reasons** why the principles behind standardization, in the industrial automation and similar systems areas, must in some cases evolve:

3.1 The more the systems approach is of concern (segment 2 standards), the less adequate the traditional function/component-product oriented topics of standardization are. New standardization approaches are needed:

- enabling “plug & play” of elements into systems, thanks to proper (relevant, open, stable) interfaces and associated tools;
- allowing re-use of past proven work, thanks for example to standard object-oriented / encapsulation / library & database techniques, etc.;
- streamlining the necessary exchanges between individuals and organizations cooperating in the same project—ideally: “write information once, use it everywhere”, at no extra cost.

3.2 IEC develops standards too late. This is particularly true—and a sensitive issue—for segment 2 standards, where the key market values are the capability to be ready on time and to innovate.

The track record of IEC work is clear: the bigger the IT content, the bigger the chances that a document will be obsolete, at least in part, at the date of publication. In addition to speeding up, another potential solution to this is to segment functionally rather than by technology type, since this makes the standards less vulnerable to technological obsolescence.

3.3 The consensus method of achieving International Standards, in the traditional IEC manner, is not relevant in all cases.

The agreement of almost all parties concerned, or the agreement of public bodies or **nationally** grouped interests, is not relevant in all industrial domains or for all possible subjects of standardization—and especially not for all segment 2 and segment 3 standards.

3.4 At the same time, the consensus method is the only relevant one in some cases.

Information technology pervades all domains, and particularly the ones requiring safety features. However, it must be kept in mind that, as far as public safety is concerned, the consensus in a standard between public representatives and industry ones cannot be avoided even if it is time-consuming.

Thus, in order to speed up the development of purely industry-driven standards, the safety requirement should be isolated and placed in safety standards, and these standards should be explicitly referenced in industry-driven (segment 2 and 3) standards.

3.5 Even when it is relevant, the IEC method of assessing consensus is not always efficient enough.

Although international standards are increasingly being recognized as eliminating barriers to trade, the slow, formal, traditional process of standardization cannot efficiently determine that a consensus has been achieved between the major forces represented in the market.

Any other method—independent of IEC—based on a flat, unweighted approach may similarly be too slow.

3.6 IEC and ISO leave the door too wide open for governments to introduce additional compulsory regulations based on purely industry-driven standards.

When not dealing with the public interest—health, safety or the environment—the development of a standard by industry should not in itself be taken as a reason by governments, which are of course sovereign in these matters, to enact a corresponding regulation. However, whenever a regulation is necessary by law to protect the public interest, it should be based on an IEC or ISO International Standard where applicable, developed on a consensus basis by industry and public representatives and enacted with the consent of industry but outside IEC or ISO.

3.7 Nevertheless the IEC (and ISO) represent values of worldwide importance which must be conserved for the benefit of all the industrial market actors.

Among these key values are:

- IEC's (and ISO's) reputation as being international, neutral, non-profit organizations;
- IEC's (and ISO's) status as standardization organizations recognized by the World Trade Organization as significantly contributing to the improvement of world trade in goods and services;
- their highly-appreciated track record due, among other factors, to the standards-making process's ability to guarantee the following for all technical specifications (especially in the segment 3 domain):
  - their quality;
  - their maintenance;
  - their stability.

4 Recommendations for new standardization principles common to all segments

These recommendations apply primarily to the industrial automation and similar systems sectors with extensive high-technology contents. Their pertinence to each segment is mentioned. Their relevance to other industrial or service domains should form the subject of further consideration.

4.1 Take full advantage of having different "IEC and ISO products" addressing clear segmented needs

IEC and ISO have a variety of products ranging from true International Standards to others such as Technical Specifications (TS), Publicly Available Specifications (PAS) including "pre-standards", and Industry Technical Agreements (ITA). All these products should be positioned, engineered and supported so that they may address clearly segmented needs, in a manner understood by all interested parties.

4.1.1 Position the right type of product for the right type of need

This product portfolio must be applied to the kind of standards which industry needs, which can—where segment 2 is concerned—be developed in a matter of a few months, as is done by many consortia. Discussion and development may be different and take longer when segment 1 or segment 3 is addressed.

4.1.2 **Develop/adapt the procedure appropriately for each of these products (addressing the full life cycle)**

Procedures must also be made consistent with the segment addressed, with a voting or acceptance process which is fair to an equitable set of industry representatives. These are the true stakeholders, and not necessarily national standards bodies.

4.1.3 **Make clear to all those interested (e.g. NCs, TCs, industry) what the key differences between these products are**

There is much left to do to keep all interested parties (including SMEs, government bodies, the National Committees members and so on) clearly informed. Special emphasis is needed on bodies *not familiar at all* with the work of IEC and ISO.

4.2 Create full International Standards only where they enable trade among producers, integrators, users, …, and across national boundaries

There is a clear need for neutral, international organizations to provide processes for the development and maintenance of open standards that enable free markets among producers and users, and across national boundaries.

4.2.1 **International Standards (ISs) should not cover good engineering practice (segment 4), or any similar domain**

Where simpler types of specification or free competitive conditions may apply, creating a full IS has little relevance.

4.2.2 **ISs should be focused on the following selected domains:**

- safety, environmental, electromagnetic compatibility (EMC), and other generally accepted regulatory domains (segment 1);
- IT standards specifying tools and product definition information employed at different stages in the product life cycle and required for successful interoperation (segment 2a);
- product requirements and assessment (segment 3, segment 2b);
- conditions of service, installation and transport (segments 2, segment 3), only where they are needed to satisfy the system integration conditions shown in 6.1 below, or in other cases where these are required to be uniform in order to be useful.

4.3 Start development of a standard only if conformance to it can later be tested; verify the usability of standards before approving them; and ensure that standards are actually tested and applied before being officially published

As industry has often shown us, a demonstration, proof-of-concept or prototype enormously increases the credibility of a new solution. Even more, in some high-technology areas where the market does not yet exist, standardizing only after industrial-strength products or systems are already on the market is neither realistic nor useful, and very often too late.

In these high-technology areas, the quality and implementability of a specification cannot necessarily rely on previous manufacturing or market experience, and must be guaranteed by other methods. Therefore, “pre-standards”—e.g. PASs and ITAs—are strongly recommended for use early in the process, in order to ensure verifiability of conformance, implementability and market acceptance.

Approval of interface specifications for complex systems should occur only after prototypes have been demonstrated and have actually passed compliance tests.

Whatever the standard, it ought to provide for an associated method of practical and cost-effective verification. This verification should be obtained by objective test methods which can be either performed by the manufacturer itself or witnessed by a third party where explicitly requested by the user.

This implies that full ISs must not be approved in the absence of fully specified, open conformance tests.

4.4 Manage each IEC and ISO project the same way industry manages its projects

4.4.1 Strengthen industry feedback procedures

Lessons from consortia and multi-party research projects, where industry feedback exists, show that it is possible to achieve satisfactory results without undue waste, argument or disproportionate effort.

To get this result, feedback should be sought as a full task in its own right, with surveys of manufacturers and users. Sector Boards are precisely the beginning of this effort in the IEC. Industry groups may be involved directly in providing their requirements on electronic business through the ISO/IEC/ITU/UN-CEFACT Memorandum of Understanding.

One essential result to be obtained is the regular review of standards in order to withdraw all obsolete, irrelevant, incorrect or conflicting standards.

4.4.2 Apply industry methods and rules to IEC and ISO projects

Projects should not be effectively launched before:

- a market has been identified that justifies the investment;
- the objectives are clearly defined;
- a complete and realistic development has been produced; and
- all resources required (including the project manager) have been identified and allocated, with the proper commitment from industry. Since a project in the standardization domain is "open" and the investment benefits all, ways and means should be invented in order to fund the required development effort. Multi-party research project models could be used to set up agreements between the sponsors and the IEC or ISO.

One implication is that IEC must review the management of new work item proposals. Another is that projects should be subjected to *true* periodic reviews (strategic & technical).

Industrial project management tools should be used to achieve the effective planning and successful completion of projects, coping properly with time, money and other resources.

Standards should be as short as possible. Among other things, they should contain only a *minimal* amount of non-normative text.

4.4.3 Avoid irrelevancies and redundancies in the IEC and ISO catalogues of standards

4.5 Exploit the value inherent in existing solutions

4.5.1 Encourage use of existing standards for new work

Other standards development organizations (SDOs) should be encouraged to submit their standards for adoption as IEC or ISO International Standards, either in the normal way, on the "Fast Track", or as Publicly Available Specifications (PAS) according to the existing PAS processes.

For new standards projects—including revisions—SDOs should offer the "right of first refusal" to IEC and ISO, and if the proposal is accepted by IEC or ISO withdraw their own standards after a transition period.

IEC and ISO should encourage specifications of emerging technology from other fields to be applied in the field of industrial automation, after assessment of their applicability.

Conversely, generic, widely-reusable resources should be identified—e.g. object types, interface description methods, dynamic behaviour description methods, automation-prog-

ramming languages, networking, techniques to improve dependability. Their development should be concentrated in one place, utilising relevant expertise from the different application areas, and the results reused wherever useful, e.g., for robots, numerically controlled machines, coordinate measurement machines, programmable controllers, and other industrial automation devices.

4.5.2 **Eliminate parallel standardization within IEC and ISO**

IEC and ISO should provide for much better means and procedures to avoid various groups preparing “concurrent” or “overlapping” standards. This represents much waste of energy for industry, at every phase of the life-cycle from standards development to implementation.

4.5.3 **Encourage adoption of IEC and ISO standards without local changes or additions**

IEC and ISO should actively encourage national and regional standards bodies to adopt ISO and IEC standards once these provide acceptable results as they are. It is not the purpose of a regional body to specify deviations from, or provide a specific interpretation of, an IEC or ISO standard.

4.5.4 **Recognize coexisting industry (de facto) standards if this adds real market value**

Where the users have no requirement for a single standard, but may have a need for multiple alternatives (e.g. different points in the “cost/function/performance” space), there seems to be no value added by proposing an IS aimed at replacing existing industry specifications.

IEC and ISO should consider recognizing alternative (“competing”) specifications only in the cases where this adds real value for system integrators and/or end users, compared to leaving the subject untouched.

4.5.5 **Encourage traditional standardisation groups to use existing industrial automation standards for digital product definition**

Many traditional standards groups should be encouraged to utilise the existing industrial automation standards to develop digital definitions of their products.

4.6 Avoid development of standards which encourage inappropriate regulation

IEC and ISO TC management and members should analyze whether a standard proposed for development runs the risk of encouraging inappropriate regulations to be introduced by governments. If this is the case, appropriate remedial measures should be taken before the standard is developed.

5 Recommendations for new standardization principles specific to segment 1

5.1 Maintain and enhance the current consensus method

For standards relating to safety, there is still a need for consensus-based methods. The standards will support government bodies in particular in ensuring that products meet environmental and safety requirements. IEC and ISO have in the past proved to be the type of neutral forum that has wide and balanced representation for the creation and approval of standards.

These methods must still be improved in order to speed up the development cycle of standards, so that the process remains credible to industry and government. This is particularly critical where technology is fast evolving, which makes the existing, accepted standards obsolete.

5.2 Develop and promote the use of only one generic safety standard

As safety standard development is usually time and resource-consuming, the development of such documents should as far as possible be limited to one generic safety standard and some sector safety standards when strictly necessary.

The generic safety standard should be comprehensive and objective-oriented rather than method or technique-oriented. It should allow safety certification and be sufficiently robust to sustain the fast evolution of IT for several years.

Promoting the single generic safety standard, and getting its official recognition by all the sector regulators in every country, is a condition *sine qua non* for facilitating cost-efficient use by industry of certified generic subsystems in safety sector applications (nuclear, avionic, railway, road transport, marine engineering, …). Otherwise the development of the generic standard would have been a waste of time.

5.3 Develop limited sector safety standards only where relevant

Sector safety standards are to be found in sectors which already had well-developed safety cultures and specific safety approaches before the development of the generic safety standard. Publications for these sectors should be limited to the specific features which deviate from the generic approach. The sector publications should point out their differences from the generic approach, identify the points where the generic approach can be used (for example for subsystems) and how the generic safety approach and the sector safety approach can be consistently applied together.

6 Recommendations for new standardization principles specific to segment 2

6.1 Develop all facets involving the streamlining of system integration ("plug & play", "reuse", "data exchange and sharing")

Integration of a product into a subassembly or of a subassembly into a larger system to ensure a mission (segment 2a) brings with it a growing set of key issues, which may find resolution in ISs or other products. The following elements are anticipated:

- identification of the relevant interfaces within the system;
- description and representation of the products or subsystems concerned, throughout their lifecycle (which may be very long);
- unambiguous description of functions and data for aspects such as setup, operations and maintenance;
- description of the dynamic behaviour of the interworking system elements in order to achieve the required performance;
- stability of interface definitions over time;
- tests to verify conformance to other requirements contained in International Standards;
- classification methods and levels of performance to guarantee correct product specification;
- conditions of service, installation and transport.

6.2 In areas of rapid innovation where system integration is of key concern, focus early standardization on relevant *interoperability interfaces only*

In more and more different application and industry areas, the principal developments depend on the interconnection of different elements, rather than just on the increased sophistication of the individual elements themselves. The clear need resides in properly documented, proven and maintained open "interfaces". The following criteria should be considered to identify a relevant "interface" subject to standardization:

- the existence of a standalone (independent) market for an element of the system;
- the expectation that the interface(s) of concern for it will (may) remain stable;
- the feasibility of testing both sides of the interface for conformance to the standard;
- the feasibility of verifying usability of the specification before approving it as a standard.

6.3 Encourage non-IS products (PASs, ITAs, TSs, TRs, Guides, TTAs etc.) where they are relevant

ISO and IEC should pursue closer collaboration with industrial fora, consortia, universities and user groups in the formulation, adoption, testing and standardization of specifications, especially in the industrial automation domain and in other cross-sector domains.

Publicly Available Specifications (PAS), Industry Technical Agreements (ITA—IEC) and International Workshop Agreements (IWA—ISO) are examples of promising new products from IEC and ISO, as alternatives to traditional ISs in areas of rapid technological innovation (segment 2), where business and trade may not require full ISs at market launch. They should now be developed and experimented with. IEC and ISO should:

- clarify and develop the corresponding decision processes (initial acceptance of project, project reviews, final adoption of project results, subsequent revisions), which must be fair and consistent with industry needs—e.g. final decisions taken by true stakeholders and not necessarily national standard bodies, minimized delays, ...;
- publish widely the procedures for generating and using PASs, ITAs and IWAs, and check users' acceptance of them;
- wait for the results of some carefully selected pilot tests before generalizing these products.

7 Recommendations for new standardization principles specific to segment 3

For this segment, ISO and IEC possess a capital of goodwill and value, recognized world-wide, which must be conserved and enhanced. The current consensus method may have reached its limit where mostly or exclusively industry players are concerned. Thus IEC should also consider adapting its processes.

8 Conformity assessment and marking common to all segments

From industry's point of view, standards, and the conformity assessment and marking which are based upon them, form a single system. Consequently a greater degree of coordination is required between the Technical Committees developing standards and the conformity assessment schemes which base their activity on those standards (and which if necessary may write related conformity assessment specifications).

Sector Board 3 requests the Standardization Management Board (SMB) to transmit the principles below to the IEC Conformity Assessment Board, with the recommendation that they should be taken into account as representing the needs of the industrial automation sector. It also requests the SMB to invite the TMB to establish similar contact with CASCO.

8.1 Principle of *one* standard / *one* test, with Suppliers' Declaration of Conformity[2] accepted *world-wide*

As ISO and IEC obtain enhanced status under the rules of the World Trade Organization agreement on Technical Barriers to Trade, their processes should become more relevant to the needs of the global market-place. These process improvements include:

[2] Supplier's Declaration of Conformity (SDoC) will not apply in some regulated areas such as safety.

- updated voting procedures that reflect market impact and influence;
- streamlining and prioritizing procedures;
- no costs beyond what is necessary.

"One standard" means designing a product to a set of globally accepted standards.

"One test" means testing a product once by either the supplier, the customer (second party) or a third-party test facility, against a consensus test specification and procedure developed similarly to the International Standard, after which the product is globally recognized as conformant no matter where it was tested.

"Accepted world-wide" means the certification or determination of conformance is accepted globally with appropriate levels of regulatory enforcement.

8.2 Regulations should impose marking requirements only where necessary to safeguard essential public health, safety, electromagnetic compatibility (EMC) or environmental considerations

The IEC should promote acceptance by regulatory authorities of the conformity assessment (CA) results of the IEC CA schemes, including the implementation of product markings which may be appropriate in a given sector, if markets support such use.

8.3 If regional or national bodies mandate use of a mark of conformity to an International Standard, this should be a common, international mark based on the relevant international conformity assessment scheme

Reverse the trend of costly proliferation of product markings requested by different countries, especially when these are based on the same international standard (e.g. IEC 60950) or on regional/national standards with equal or comparable technical requirements.

Arrange for an international declaration-of-conformity symbol, an IEC- or ISO-related symbol if relevant and if IEC or ISO members have agreed on use of such a symbol, to be used to indicate that the product conformance information (i.e. conformance to standards, technical specifications, codes and regulations, and the corresponding product marks) is located on the Suppliers' Declaration of Conformity document.

9 Actions to be taken

The actions in the Table below are a first list. They are intended to initiate the steps of transforming the principles in Clauses 4 to 8 above into practice. These actions are recommended to all standardization and industrial audiences who could benefit from them and use them to improve processes. In particular, a few measures put into practice quickly to demonstrate "quick wins" in re-engineering standardization procedures would greatly contribute to credibility. SB 3 would be interested in continuing feedback, from implementing organizations as well as the Standardization Management Board, on the practicality and current status of these actions, and intends to refine and improve them as the situation requires.

Abbreviations

What:		*Who:*	Organizations/people who should take this action
Ref.	Reference to the principle (clauses 4 to 8, above) from which this action is derived	*ACs*	IEC Advisory Committees (ACEA, ACEC, ACET and ACOS)
FDIS	Final draft International Standard	*CAB*	IEC Conformity Assessment Board
IS	International Standard	*CO*	IEC Central Office (and/or ISO Central Secretariat)
IPR	Intellectual property rights	*DMT*	ISO/IEC Directives Maintenance Team
NP	New work item Proposal (doc. to be voted on; = stage following PNW—see below)	*NCs*	IEC National Committees and ISO Member Bodies
ITA	Industry Technical Agreement	*SB3*	IEC Sector Board 3 (SB 3), *Industrial automation systems*
PAS	Publicly Available Specification (IEC-PAS or ISO-PAS)	*SB3/TCSG*	SB 3's TCs' Steering Group
PNW	Proposed new work (item)	*SMB*	IEC Standardization Management Board
TR	Technical Report (formerly Technical Report type 3)	*TCs*	IEC and ISO Technical Committees and Subcommittees
TS	Technical Specification (formerly Technical Report type 1 or 2)	*TMB*	ISO Technical Management Board

No	Action	Ref.	Who
1.	**Reengineer the selection processes for new work items; take full advantage of having different "IEC products"**		
1.1	• Position the products	4.1.1	CO
1.2	• Develop (adapt) the appropriate procedures	4.1.2,	CO
1.3	• Develop a checklist for new work items (amendment to IEC/ISO Directives). The checklist will address end user/society/trade benefits and needs, active user participation, interfaces (if any), innovation rate / expected stability, existing standards and *de facto* standards, preferred type of specification (IS, TS, ITA, etc.), first draft project plan (resources / planning until completion)	4.2, 4.3, 4.4, 4.5, 5.1	SMB, TMB, CO, SB3, DMT, SB3/TCSG
1.4	• Make clear to all those interested (e.g. NCs, TCs, industry) what the key differences between the different IEC products are (PASs, ITAs, TRs, TSs, TTAs, ...); special emphasis is needed on bodies *not familiar at all* with the work of IEC. A White Paper, available on the Web site, is one possibility	4.1.3	
1.5	• Promote the use of PASs and ITAs in areas of rapid technological innovation (Segment 2), as an alternative to traditional IS where business and trade may not require full IS at market launch	6.3	CO
1.6	• Publish widely the procedures for generating and using PASs, ITAs, etc. and check users' acceptance of them	4.1.3	
2.	**Reengineering of the standards development processes (full life cycle)**		
2.1	• Develop criteria for market relevance (user acceptance, whether technical area is already occupied by strong *de facto* standards)	4.2	SB3, SMB, TMB
2.2	• Apply market relevance criteria by initiating market measures (questionnaires to user/vendor associations) and starting regular checks of all past, current and new work against principles; use ISO/IEC/ITU/UN MoU to involve user groups	4.4.1	TCs, SB3, SMB, TMB
2.3	• Establish formal quality control (textual, IPR check at PNW and FDIS stage, correct references, completeness, utilisation of and consistency with prior standardization related work, reference models, etc.)	4.3	CO
2.4	• Introduce strict rules for technical quality control (test procedures, software verification, pilot applications, multi-vendor tests)	4.3	NCs
2.5	• Establish clear rules in the ISO/IEC Directives to avoid specific product and implementation details / Revise directives to recommend more use of references to existing horizontal or product family standards.	4.4.3, 4.5.1	DMT
2.6	• Shorten the standard development process, by utilising state-of-the-art tools and techniques to distribute, review, "discuss", and approve documents.	3.2, 4.4	TCs, SMB
2.7	• Eliminate irrelevancies and redundancies in the IEC catalogue of standards	4.5.3	TCs,ACs(SMB)
2.8	• Encourage use of existing standards for new work	4.6.1	NP proposers
2.9	• Concentrate development in a single place and provide for re-use	4.6.1	SB3
2.10	• Eliminate parallel standardization within IEC and ISO	4.6.2	SMB, TMB
2.11	• Encourage traditional standardisation groups to use existing industrial automation standards for digital product definition	4.5.5	SMB, TMB
3.	**Standardization projects for interoperability and system integration**		
3.1	• Establish a framework for standardization projects for interoperability and initiate application interface standardization projects (e.g. umbrellas for competing PASs, ITAs and TSs). NOTE - Characterization of automation objects would help to find a proper, domain-specific definition of 'interfaces', which is needed to achieve interoperability. Results from TCs may prove useful in this effort (e.g. ISO/TC 184 work on enterprise modelling and application frameworks).	6.1, 6.2	NCs, TCs, SB3

No	Action	Ref.	Who
3.2	• Establish a consistent framework for enterprise information supporting use across multiple applications	3.1, 6.1	TCs
4.	**Identification of 'coexisting *de facto* standards'**	4.6.4	
4.1	• Establish criteria and related procedures for identifying and recognizing 'coexisting *de facto* standards'		SB3
4.2	• Generate an initial list of those that are relevant to industrial automation		SB3
4.3	• Conduct a survey of their importance in the market segments.		SB3
5.	**One world-wide accepted and credible declaration of conformity**		
5.1	• Insofar as it is useful beyond the existing procedures of the IEC CA schemes, develop an ISO/IEC Guide on Conformity assessment to embody the principle of 'one standard, one test, one world-wide accepted and credible declaration of conformity' similar to Draft ISO/IEC Guide 21 - *Adoption of International Standards as regional or national standards*.		TMB, SMB, SB3, NCs, CAB, DMT
5.2	• Develop principles and mechanisms aimed at reducing the unfair use of the system. (Note: clarify "unfair".)		same
5.3	• Encourage local adoption of IS as they are, without local add on	4.6.3	NCs
5.4	**Obtain recognition of "the" generic safety standard by all sector regulators**	5.2	TMB, SMB, ACOS, the TC
6.	**ISO/IEC Declaration-of-conformity marking symbol**		
6.1	• Establish (subject to IEC's decisions on marking after the CAB WG's work) a program to study the use and to insure the credibility of an ISO/IEC Declaration-of-conformity or certification symbol showing conformity assessment to international standards, to facilitate marking requirements where necessary to safeguard essential public health, safety, EMC and the environment.	8.3	TMB, SMB, CAB, SB3
7.	• Coordinate and eventually unify digital representation of products specified in standards	2.3	TCs