IFAC INFORMATION BULLETIN

No. 74 October 2, 1972

International Federation of Automatic Control

Published by the IFAC Secretariat
D 4 Düsseldorf 1 - P.O.B. 1139

Automatic Control Terminology - 1971 Annual Survey of U.S. Standards Activities

The American Automatic Control Council, National Member Organization of IFAC, coordinates the interests of its own member organizations and those of a number of other groups insofar as these interests involve control engineering. This article covers recent standards activities of most of these organizations and it also includes work at the international level. It updates the previous article which appeared in IFAC Bulletin No. 66 of October 7, 1971.

IFAC is indebted to the magazine "Control Engineering" for the permission to reprint this U.S. Standards Survey which originally appeared in the June 1972 issue of "Control Engineering", vol. 19, No. 6, pages 65 through 67.

ANSI

American National Standards Institute
1430 Broadway
New York 10018

There has been significant progress in reorganizing and streamlining the ANSI operational structure. U.S. national committees are now set up both for ISO (International Standards Org.) and IEC (international Electrotechnical Commission). A Technical Advisory Board for Measurement and Automatic Control has been proposed by SAMA to parallel the present advisory board for Information Systems.

The TAB idea may become an overall domestic and international function relying on standards committees such as B88, C39, C85, C100, X3, X4, Z39, and USAC for IEC/TC65 to develop documents in specific areas. Detailed organization is still tentative, but concerned engineering societies and trade associations have expressed approval.

A *Guide for the Calibration of Dynamic Pressure Transducers* is nearing completion by Committee B88, Calibration of Instruments. Work has begun on a similar *Guide* for static calibration, and B88 is expected to recommend ISA SP37.1 as a national standard for transducer terminology.

ANSI Committees C39, Electrical Measuring Instruments, and C100, Electrical Reference Instruments, are guided by SAMA Secretariats. The principal activity within C39 has been the development of new safety standards for electrical and electronic instruments. This work has been heavily influenced by the publication of IEC Recommendation 348, *Safety Requirements for Electronic Measuring Apparatus*. Within C100, revisions for trial documents on transformer-type voltage dividers and precision laboratory potentiometers have been completed. The committee has also endorsed U.S. adoption of the *IEC Recommendation on Standard Cells*. Draft standards for voltage and current reference devices, dc null detectors, and ac-dc transfer devices are well along in preparation.

A *Vocabulary for Information Processing*, ANSI X3.12-1970, has replaced a 1962 *Glossary* for Federal use. It contains more than 1,200 terms and definitions. This committee has also issued X3.28-1971, *Procedures for Use of ASCII Communication Control Characters*, X3.29-1971, *Unpunched Oiled Paper Perforator Tape*, and X3.30-1971, *Representation of Calendar Date* and *Ordinal Date for Information Interchange*.

ASME

American Society of Mechanical Engineers
345 E. 47th St.
New York 10017

The Automatic Control Div. has set up under the chairmanship of W.E. Vannah of Foxboro an ad hoc Standards Panel. With the encouragement of the Dept. of Codes and Standards, the panel would:

- Prepare papers on standardization of the ACD audience
- Establish liaison with standardization efforts by other ASME groups and other U.S. organizations
- Review national and international engineering standards documents upon request
- Recommend members for boards, technical committees, and U.S. advisory committees of ANSI
- Suggest new subjects for which standardization is needed
- Organize standards-writing committees upon request

ASTM

American Society for Testing and Materials
1916 Race St.
Philadelphia, Pa. 19103

A recent change in the ASTM charter presages wider activity related to international standards, fellowships, consumer products, local communities, and the environment. Article 2 now reads:

"[A] corporation is formed for the development of standards on characteristics and performance of materials, products, systems, and services; and the promotion of related knowledge. (In ASTM terminology, standards include test methods, definitions, recommended practices, classifications, and specifications.)"

EIA

Electronic Industries Assn.
2001 I St. NW
Washington, D.C. 20006

The TR-31 Committee, which is concerned with the numerical control of machines, is updating a number of its standards, and shortly will submit to industry, for comment, a new standard on an nc interface. Chairman of TR-31 is R.V. Miskell of Union Carbide, and secretary is J. Nitkiewicz of Ex-Cell-O.

Automation Bulletin 3B, *Glossary of Terms for Numerically Controlled Machines*, is being revised under T. Proctor of Allen-Bradley. Definitions of terms used in related EIA nc standards are being added, along with terms and definitions concerned with the newer technologies of dnc (direct numerical control) and cnc (computerized numerical control). Terms and definitions associated with precision, accuracy, and servomechanisms that do not have special application to nc and have been defined by other national committees are being deleted.

The three standards on tape format for nc machines, RS-273-A, *Interchangeable Perforated Tape Variable Block Format for Positioning and Straight Cut Numerically Controlled Machines*, RS-274-B, *Interchangeable Perforated Tape Variable Block Format for Contouring and Contouring/Positioning Numerically Controlled Machines*, and RS-326-A, *Interchangeable Perforated Tape Fixed Block Format for Positioning and Straight Cut Numerically Controlled Machines*, will be replaced with one tape format standard. The G and M code assignments are being updated during this review, which is under F. Hesford of Cincinnati Milacron.

The two standards on punched-tape code, RS-244-A, *Character Code for Numerical Machine Control Perforated Tape*, and RS-

358, *Subset of U.S.A. Standard Code for Information Interchange for Numerical Machine Control Perforated Tape*, are being reviewed and revised as necessary to remain abreast with the technologies of dnc and cnc systems. This activity is under C. Isak of General Electric.

A. Bacheler of Westinghouse is coordinating the preparation of a standards proposal, *Interface Between Numerical Control Equipment and Data Terminal Equipment Employing Parallel Binary Data Interchange*. The standard will have application in btr (behind the tape reader) types of dnc systems.

IEEE Institute of Electrical and Electronic Engineers
345 E. 47th St.
New York 10017

Recently published standards include No. 94, *Automatic Generation Control on Electric Power Systems;* No. 101, *Statistical Analysis of Test Data;* No. 312, *Communication Switching;* No. 315, *Graphic Symbols for Electrical and Electronics Diagrams* (ANSI Y32.2); No. 318, *Varactor Measurements;* No. 322, *Rules for the Use of SI Units*. The Automatic Control Society has a project under George Axelby of Westinghouse Air Arm which covers control terminology, and some of its material will be included in the new *IEEE Dictionary of Electrical and Electronics Terms*.

IEC International Electrotechnical Commission
1, rue de Varembe
Geneva, Switzerland

A recent proposal that IEC take over direction of international certification of electrical equipment emphasizes the importance of the work of this organization, and specifically the recommendations for standards which would form the basis of this certification. L. Podolsky presented a summary at the meeting of the U.S. National Committee for IEC in New York in December 1971. While international (European) certification is presently limited to electronic components, there is reason to expect that international certification procedures will be adopted for equipment for automatic control. Standards recommendations relating to automatic control must be carefully considered with this in mind.

IEC/TC13/Working Group 4—Dimensions of Panel-Mounted Electrical Switchboard Indicating Instruments. The proposal that this group become directly concerned with dimensions of industrial process instrumentation was disapproved. There is considerable presssure for adoption of existing or modified German DIN dimensions [CE, Nov. '71, p. 53—Ed.]. For industrial process instrumentation, there are a number of valid objections to this approach. The U.S. process control industry was represented at meetings of this group in Budapest in November 1970 and in Elsinore, Denmark, in May 1971.

IEC/TC25/WG4—Letter Symbols for Automatic Control. Drafts in French and English covering 15 letter symbols have been forwarded to national member organizations. Definitions of terms are based on TC 65 (Secretariat) 21, dated July 1971. U.S. comments have been channeled through J.G. Brainerd, University of Pennsylvania.

IEC/TC31—Electrical Equipment for Hazardous Locations. Work in the field of explosion-proofing and intrinsic safety of electrical measurement and control instruments by ISA/SP48, together with the activity of the National Fire Protection Assn., Underwriters' Laboratories, Factory Mutual Laboratories, and others, has provided a very effective basis for promotion of a position favorable to U.S. practices. W.F. Hickes of Foxboro has effectively represented the U.S. instrument industry on several subcommittees and working groups.

IEC/TC65—Industrial Process Measurement and Control. A plenary session and several working-group meetings of this committee were held in Scheveningen, Holland, in October 1971. The U.S. had six representatives at the meeting. SAMA sent W.H. Howe, P.F. Pagery, and H.H. Koppel.

After considerable discussion, a decision was reached to limit the activity of the committee to industrial process measurement and control. Preliminary provisions were made to take over the functions of ISO/TC124, which has now been disbanded. For the present, working groups will carry on their activities without change.

There are presently nine working groups within IEC/TC65. The U.S is represented on eight. The groups are:

Working Group 1 (Terminology). This group now includes the former ISO/TC124, also Terminology, many of whose members were also members of IEC/TC65. A new *Chapter 37 of the International Electrotechnical Vocabulary* has been prepared in English and in French. This has been circulated for comment, including a representative circulation in the U.S.

Working Group 2 (Service Conditions). The U.S. holds the Secretariat for this group. A fourth revision of a document covering a number of environmental and power supply service conditions has been circulated for comment to members of TC65.

Working Group 3 (Safety and Reliability). A check list for the multiplicity of factors which affect the safety of the process and the viability of its control is being prepared. H.H. Koppel of Bailey Meter represents the U.S.

Working Group 4 (Interface). The proposal for a 4-to-20-ma dc signal level (with 0 to 20 optional) has become a formal IEC recommendation, as has also the 0.2 to 1.0 bar signal for pneumatic devices. A proposal developed by V.V. Tivy and W.F. Hickes of ISA Committee SP50 is being studied. This seems to offer a flexible range for loads and intrinsic safety of electric power supplies.

Working Group 5 (Temperature Sensors). The work begun as ISO/TC124/WG2 on the characteristics of industrial process platinum resistance thermometers has been completed. Bulb and well parameters are now being discussed. W.F. Hickes, who chaired the corresponding SAMA/PMC standards committee, is the U.S. representative. There is a recommendation that the scope be broadened to include pressure sensors—and possibly all primary sensing devices used in industrial processing.

Working Group 6 (Methods of Testing Transmitters, Controllers, and Final Control Elements). This group, formerly ISO/TC124/WG3, continues its study of procedures for type testing. The work is especially important in view of the likelihood that standards which are developed may form the basis for certification of process instruments. C.E. Ryker, ISA Standards and Practices Board, represents the U.S. An Italian proposal for developing methods of tests for systems will probably be deferred.

Working Group 7 (Instrument Scales). IEC/TC65 showed little interest in this work originating in ISO/TC124/WG4. However, it is applicable to all indicating and recording instruments, whether electrical, electronic, or mechanical.

Working Group 8 (Dimensions of Industrial Process Instruments). The former ISO/TC124/WG5 has been inactive since a meeting in Prague in 1969. At the Scheveningen meeting, it was proposed that the group limit its work to conventional process controllers, while dimensions of other devices, such as wide stripchart recorders, crt and digital indicators, and switches, should be assigned to groups with specialized personnel. This activity is of major importance both to makers and to users of process instruments. W.H. Howe of SAMA carries the U.S. banner, with strong support from several other nations. Adoption of the German DIN standard, as proposed by some delegates, would appear to be technically undesirable, as well as establishing a significant nontariff trade barrier against U.S. instruments. There is optimism that a set of dimensions will be adopted which will provide for optimum instrument design and will not markedly favor any one national commercial interest.

Working Group 9 (Control Valves). There is a question whether this group, formerly ISO/TC124/WG6, should remain in IEC/TC65 or be assigned to an ISO committee on piping. The U.S., represented by H. Bauman of Masoneilan, argued strongly for IEC/TC65. The group has made significant progress on recommendations regarding control-valve sizing. At the Scheveningen plenary session, it was recommended that the scope be broadened to include actuators and positioners, and the name of the group be changed to Final Control Elements.

ISA Instrument Society of America
400 Stanwix St.
Pittsburgh, Pa. 15222

In 1971, ISA published one new standard and one new recommended practice; the ISA Standards and Practices Board authorized

four new standards committees; and ISA established a Fund for Overseas Standards Travel.

The ISA Fund for Overseas Standards Travel, established through contributions from U.S. corporations, permits qualified delegates (i.e., authorized by ISA and ANSI) to represent the U.S. at international standards meetings. The fund will reimburse ISA/ANSI delegates for economy-class air travel between their home airports and the point where the overseas meeting is to be held.

ISA Standard S37.5, *Specifications and Tests for Strain Gage Linear Acceleration Transducers*, presents procedures for specifying, calibrating, testing, and showing performance characteristics of straingage linear accelerometers. It promotes simple but complete specifications as well as reducing design time, procurement lead time, and costs of labor and materials.

ISA Recommended Practice RP55.1, *Hardware Testing of Digital Process Computers*, covers general recommendations applicable to all hardware-performance testing, specific tests for pertinent subsystems and system parameters, and a brief glossary defining terms.

ISA Standards Committee SP61, Instrumentation Loop Diagrams, has been redesignated as SP5.4 with the same title.

Newly authorized standards committees are SP61, Industrial Computer System Fortran Procedures for Executive Functions and Process Input-Output; SP62, Biomedical Instruments; SP63, Armored Type Liquid Level Gages; and SP64, Food Canning Instrumentation.

ISO International Standards Org.
1, rue de Varembe
Geneva, Switzerland

The Council of ISO has approved 13 terms and their definitions for use in standardization work. These terms (see NBS STR4283) will constitute the first part of a *Vocabulary of Basic Terminology* for participants in this work. The terms were defined by ISO's Standing Committee for the Study of Principles of Standardization (STACO), an international group.

The international ISO body associated with numerical control of machine tools is ISO/TC97/SC8. It met in Zurich Oct. 12-15, 1971, and worked on symbols and vocabulary, interfaces and sensors, format, and advanced nc systems. The U.S. delegation consisted of R.V. Miskell, Union Carbide; T. Proctor, Allen-Bradley; F. Hesford, Cincinnati Milacron; K. Merner, Kearney-Trecker; D.G. Fair, Sunstrand; and E.E. Miller, Western Electric. One of the working papers was IEC/TC65/WG1, draft of the *International Electrotechnical Vocabulary* (see IEC). The third draft proposal for the *Vocabulary for Numerical Control* was approved for inclusion in the *ISO Vocabulary for Information Processing*. The second draft of *Symbols for Numerically Controlled Machines* was approved for letter ballot by SC8, as was a proposal for *Specification of an Interface Between the Numerical Control Unit and the Electrical Components of an NC Machine Tool*.

U.S. delegates to the June 1971 meeting in London of TC30, Fluid Flow in Closed Conduits, were Roger Dowdell, University of Rhode Island, and S.R. Beitler, ASME staff. Their travel was supported by SAMA. The group is active in head-type flow measurements, for which there is both domestic and international concern about improvement of accuracy, especially at low Reynolds numbers. Work on measurement with magnetic flowmeters and turbine flowmeters is planned. The design of cryogenic flowmeters and the evaluation of their performance is a project at NBS.

NBS National Bureau of Standards
U.S. Dept. of Commerce
Washington, D.C. 20234

The U.S. delegation to the October 1971 meeting of the General Conference of Weights and Measures was headed by L.M. Branscomb, Director of NBS. The conference defined Atomic International Time as that maintained by BIH, approved the mole as a measure of the quantity of matter, and gave the names "pascal" to the newton per square meter and "siemens" to the reciprocal ohm.

The Office of Information Processing Standards is setting up two additional Federal task groups. One will propose Government guidelines for hardware and software component evaluation criteria, measurement techniques, and procedures. The other will recommend revisions to COBOL X3.23-1968. The NBS STR4283, available on request, lists ISO's definitions of standards terms.

The Office of Computer Information now regularly maintains updated references on large-scale computer systems, communications terminals, graphic processors, minicomputers, process control computers hardware and software analyses, time-sharing applications, display equipment, and peripheral devices.

SAE Society of Automotive Engineers
2 Pennsylvania Plaza
New York 10001

Committee A-6, Fluid Power and Control Technologies, has completed its work on document ARP 1254, *Test Methods and Instrumentation*. Like MIL-STD-1306, *Fluerics Terminology and Symbols*, it was developed in conjunction with a liaison group from the Navy. Related material on design and analysis is to be found in *Fluidic Systems* by C.A. Belsterling of Franklin Institute, based on work for the Army Aviation Material Laboratories.

SAE J956 deals with definitions for remote and automatic control systems for construction and industrial machinery. SAE J195 deals with automatic vehicle speed control.

SAMA Scientific Apparatus Makers Assn.
1140 Connecticut Ave. NW
Washington, D.C. 20036

In testimony on the proposed International Voluntary Standards Cooperation Act, SAMA Standardization Committee Chairman W.E. Vannah of Foxboro stated that the increasing number of international standards activities have been forcing U.S. instrument and control manufacturers to organize responses on a crash basis. Because early drafts of international standards are frequently based on existing practices in a single nation, accommodation through the use of multiple designs is also often necessary. Four factors are essential to sustain the U.S. trade position against the challenges offered to it by international standards activities: 1) continuity of representation; 2) addition of more user and Government representatives to U.S. delegations; 3) joint industry-Government accreditation of delegates; and 4) adoption of an international standards assurance system.

Vannah further stated that the enactment of this legislation should assist significantly in consolidation of U.S. positions for international engineering and commodity standards, through the support of U.S. delegates in international standards activities.

E.P. Lange of PMC/SAMA has asked the members of ANSI C85 to review SAMA Standard PMC20-2-1970, *Process Measurement and Control Terminology*, and has also submitted the document to the ANSI Board of Standards Review as a proposed American national standard. Developed in 1955 and revised in 1964 by a committee chaired by W.D. Wood of Sybron/Taylor, PMC20-2-1970 deals with industrial process instrumentation, and includes terms relating to measurement and control and the static and dynamic performance of indicators, recorders, controllers, indicating controllers, recording controllers, transmitters and transducers. The ISA Standards and Practices Board endorsed it in April 1971.

In order to sustain the level of involvement in national and international standards for the U.S. instrument industry, SAMA has appointed a full-time standards executive, James E. French of the Washington office.

Acknowledgement

Duane T. McRuer, President, AACC, and H.L. Mason, Chairman, AACC Terminology Committee, wish to thank the organizations whose responses made this report possible. The compilation was assisted by L.N. Combs, J.E. French, W.H. Howe, P.S. Lederer, D.E. Limbert, E.J. Mastascusa, A.J. Mauceri, W.R. McGrath, R.V. Miskell, J.I. Morgan, M.A. Ostergaard, C.R. Otto, and D.W. Smith.

Elections and Appointments at IFAC

At the recent meeting of the IFAC General Assembly held in Paris, June 1972, in conjunction with the 5th IFAC Congress, elections to the IFAC Executive Council were carried out and the list of IFAC officers for 1972 – 1975 reads as follows:

President:	Mr. *J.C. Lozier*, USA
1st Vice-President:	Mr. *U.A. Luoto*, Finland
2nd Vice-President:	Prof. *Y. Sawaragi*, Japan
Past President:	Prof. *V. Broida*, France
Honorary Treasurer:	Dr. *M. Cuénod*, Switzerland
Ordinary Members:	Prof. *G. Ferrate Pascual*, Spain
	Prof. *L. Hyldgaard-Jensen*, Denmark
	Acad. *A.M. Letov*, USSR
	Prof. *M. Nałecz*, Poland
	Prof. *M.N. Özdaş*, Turkey
	Prof. *T. Vamos*, Hungary
	Prof. *J.H. Westcott*, England

Also during the IFAC Congress week in Paris, the IFAC Executive Council appointed IFAC Committee Chairmen and Vice-Chairmen and two Honorary Editors to serve for the same period as the members of the Executive Council.

The Committee Chairmen are listed below:

Advisory Committee:	Prof. *O. Aven*, USSR
Policy Committee:	Mr. *W.E. Miller*, USA
Public Affairs Committee:	Prof. *P.J. Nowacki*, France
Technical Committees on	
Applications:	Prof. *G. Quazza*, Italy
Components and Instruments:	Prof. *H.W. Smith*, Canada
Computers:	Dr. *J. Gertler*, Hungary
Economic and Management Systems:	Prof. *J.F. Coales*, England
Education:	Prof. *St. J. Kahne*, USA
Social Effects of Automation:	Mr. *P.A. Sprague*, USA
Space:	Prof. *B.N. Petrov*, USSR
Systems Engineering:	Dr. *L.K. Kirchmayer*, USA
Terminology and Standards:	Mr. *A.E. Hakala*, Finland
Theory:	Prof. *H. Kwakernaak*, Netherlands

Each IFAC Committee has one, two or three Vice-Chairmen.

After 15 years of service as Honorary Secretary of IFAC Dr.-Ing. *G. Ruppel*, Fed. Rep. of Germany, retired in June 1972 and Mr. *M.A. Kaaz*, Fed. Rep. of Germany, was appointed by the IFAC Executive Council to succeed Dr. *Ruppel*.

Computer Applications in the Automation of Shipyard Operation and Ship Design

This is the theme of an international conference to be held in Tokyo, Japan, August 28 to 30, 1973, under the joint sponsorship of the International Federation for Information Processing (IFIP), the International Federation of Automatic Control (IFAC), and the Society of Naval Architects of Japan (JSNA). The IFIP and IFAC Technical Committees immediately involved are the IFIP TC on Computer Applications in Technology and the IFAC TC's on Systems Engineering and on Applications.

The Conference will deal with all aspects of the application of computers to aid the modern technology of ship design and ship constructions. Included will be discussions of the details of modern (present and proposed) automation techniques for ship lofting, stress determination, structural design, plate preparation, prefabrication, welding, launching, outfitting, etc. Related topics such as aerospace and automotive industry techniques applicable to shipyard operations, coordination of steel mill and shipyard operation, management techniques involved, use of exotic materials, etc. will also be included in the Conference content.

Papers are invited on the following topics:

- General: Research and Development (FEM, Model Test, etc.), Computer and Communication Technology
- Design
- Production Information System
- Materials Handling
- Modern Facilities

Potential authors should submit three copies of an abstract in English (200–300 words, typewritten) by October 31, 1972, to

Prof. *Y. Fujita*
c/o The Society of Naval Architects of Japan
No. 35 Shiba-Kotohiracho, Minato-ku, Tokyo/Japan

They will be notified of the result of the paper selection by December 31, 1972. Deadline for the submission of full papers is April 30, 1973.

Enquiries and all correspondence should be directed to the address given above.

5th IFAC Congress Proceedings

The entire English language proceedings of the 5th World Congress of IFAC, Paris, June 1972, contain 230 papers including 12 survey session papers. The proceedings consisting of four hardbound and illustrated volumes can be purchased either as a complete four-part set or as individual volumes:

Volume 1 – Process control, modelling and numerical control, power, thermal processes, and general applications.

Volume 2 – Transportation, aeronautics and space, ship automation, and control components.

Volume 3 – Ecology, systems engineering, large scale, sensitivity optimization, and adaptation theory.

Volume 4 – Education, feedback, regulators, linear and nonlinear systems, identification, discrete and stochastic systems, and differential games.

The price per set is US $ 85.00 for individuals and US $ 125.00 for institutions. The price for each part is US $ 25.00 for individuals and US $ 35.00 for institutions.

Orders should be addressed to the

Instrument Society of America (ISA),
400 Stanwix Street, Pittsburgh, Pa. 15222/USA.

Purchasers in Europe or Japan order from

Pertel Ltd., Att. Mr. *T.E. Langdon*,
30 Cursitor Street, Chancery Lane,
London E. C. 4 / England

or

Taisay Koheki Company Ltd.,
Higashinakano 1-46-19, Nakano-ku,
Tokyo / Japan

respectively.

Simulation Society in Brazil

On the initiative of the Brazilian Society for the Progress of Science, a Brazilian Society of Simulation, the Sociedade Brasileira de Simulação – SBS, was created in Summer 1972 with the aim of developing and promoting study and research in this field and of representing and assisting the research workers and scientists. Meetings, seminars, symposia in the simulation area are planned to be held to foster an exchange of information and experience and to enhance relationships with other organizations working in similar and border fields.

Interested parties wishing to learn more about the Society, its specific goals and activities, about membership questions etc. contact:

Sociedade Brasileira de Simulação,
Prof. *C.L. Barczak*, Secretary,
School of Engineering of Itajubá,
37500 Itajubá – Minas Gerais,
P.O.Box 50, Brazil.