



NIST  
PUBLICATIONS

# *NISTIR 6292*

## *Towards Strategic Management of Standards Activities at NIST*

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NO. 6292  
1999





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**May 1999**



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## **Abstract:**

This paper describes strategic standards management, its use by U.S. companies, and the potential use of this important methodology by DoC/NIST and other government agencies. It also describes the role of NIST's Standards Advisory Committee (SAC) in defining a plan that each NIST OU can tailor to manage its own standards activities, and other agencies can similarly adopt. A checklist is provided for use by NIST OUs as they set priorities and implement activities in support of the standards-related work associated with their missions. This checklist can also be adapted for use by other Federal agencies.

## **Key Words:**

NTTAA, Operating Units, SAC, Standards, Standards Advisory Committee, Strategic Standards Management, Strategic Planning.

## Introduction

The Government Performance and Results Act of 1993 gave impetus to the use of strategic planning in Federal Agencies. While this approach has become widely used at NIST, the Institute has not yet significantly integrated standards activities into these planning efforts. This paper attempts to interweave strategic management and standards activities more effectively.

In addition to the GPRA, another law provides impetus for NIST's standards activities - the National Technology Transfer and Advancement Act (NTTAA). This law directs NIST to provide public sector leadership for voluntary standards<sup>1</sup> and conformity assessment. To carry out these new responsibilities, NIST developed an Implementation Plan[1] for the NTTAA, that requires the development of strategic standards management plans by NIST and other agencies for their standards activities.

This paper advocates incorporating standards management into the traditional strategic planning that NIST and other Federal agencies conduct. Such incorporation of strategic standards management is valuable for any organization that desires to create a standards environment that connects people and the standards management system within and across its units. Strategic standards management can ensure that Federal participation in standards activities does not result solely from happenstance and individual interests, but rather fulfills expressed programmatic needs that have been rigorously examined and thoughtfully planned. The strategic approach described in this paper moves toward a more integrated and systematic approach to defining and implementing standards activities.

For several years, the American National Standards Institute (ANSI), working closely with industry, has had a program for strategic standards management. The next section describes this approach.

## ANSI's Use of Strategic Standards Management

ANSI created a system called Strategic Standardization Management or SSM<sup>TM2</sup> in the early 1990s. Private industry users of this system have defined it as "as a management discipline and methodology that investigates all aspects of standardization across a business, and/or industry; then defines, recommends, and implements appropriate strategies and policies to leverage standardization so that a firm can gain competitive advantage and avoid disadvantage." *Strategic Standardization* can also be described as "the integration of several standardization products, services, processes, and subsystems

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<sup>1</sup> In this instance, "standards" refers to documentary (also termed normative or voluntary consensus) standards.

<sup>2</sup> ANSI has a trademark on the symbol "SSM" for Strategic Standardization Management.

to facilitate implementation of a complete system. These systems can then be implemented quickly and efficiently.”[2]

This strategic standardization management concept extends beyond traditional standards committee activities. Many of the elements of this process are global in nature and have the potential for major impact on the mission and bottom line of a company or agency. In the keynote address delivered at the 1992 American National Standards Institute (ANSI) annual conference in Chicago, George Fisher, then Chairman of both Motorola and the U.S. Council of Competitiveness, stated that “American companies must understand that standardization is a strategic business issue that has a direct impact on new product development.”[3] Standards decisions are now deemed to be too important to be left to low level management.

Shifts toward more strategic consideration of standardization activities led a core of ANSI company members to sponsor a series of studies to investigate all aspects of the environment surrounding standardization. This group led several major research projects to confirm the paradigm shift in companies from mere use of standards and participation in standards committees to consideration of strategic standardization. Very simply, companies began to assess their standards activities in terms of their missions, goals, and overall strategic plans. They viewed standards activities as central to achieving key business goals. As a result, they participated in standards committees in accordance with recognized priorities, then included projected participation in budget forecasts. This approach became imbedded in the strategic standardization management focus and training and has contributed greatly to the use of SSM™ as a tool to enhance the competitive advantage of U.S. companies.

A recent article in ASTM Standardization News [4] points out that SSM™ requires that management recognize standards as more of a business issue than a technical one; and that global standards are used today as a basic vehicle for communicating requirements to customers and suppliers worldwide. That article also states that there is no doubt that failure to manage standards participation in the formal strategic planning and global design review processes will result in competitive disadvantage.

## **Strategic Standards Management at NIST**

Many national governments use a strategic approach to standards in order to gain commercial advantages for their industries. Since NIST recognizes and understands the role that standards play in the global marketplace, strategic standardization management can help NIST and its partners and customers maintain a competitive edge.

To facilitate this new approach, the Standards Advisory Committee (SAC) at NIST has been tasked to address strategic standards questions, many of which will be described later under the “Checklist for Strategic Standards Management Implementation” section. Most recently the SAC produced a Standards Policy for NIST on voluntary consensus standards matters that has been adopted by the NIST Executive Board. (See Appendix A.)



In 1995, NIST chartered the SAC to:

1. Advise the Director and Operating Unit (OU) Directors on issues relating to NIST participation in standardization activities;
2. Provide broad NIST representation in the development of recommendations for NIST standards policies and procedures, including mechanisms for setting priorities for participation in national and international standards activities;
3. Provide a mechanism for NIST to use to analyze standards-related developments outside the Institute that have implications for NIST and to provide information to the Interagency Committee on Standards Policy as appropriate;
4. Assist the Director and OU Directors to ensure that NIST standards participation is effective and efficient and to encourage cooperation and the exchange of information among OUs concerning standards-related activities;
5. Ascertain and resolve potential conflicts within NIST and within other agencies on specific standards.

The SAC comprises the Director, Office of Standards Services, who serves as Chair, and one representative appointed from each NIST OU. The SAC works closely with the Director of NIST to carry out standards-related mandates. The official SAC charter is reproduced in Appendix B.

In consultation with the SAC, each OU within NIST is defining its own strategy for standards-related activities. In the next section, a broad-based checklist is provided for actively managing standards programs at NIST. Although this entire document focuses on the OUs at NIST, the guidance should be equally valid and useful for other agencies as they manage their own standards activities. SAC members, along with the OU's Management, are responsible for answering the questions on the checklist for their OUs. The answers provide the backbone of the standards portion of their OU strategic plans and thus, incorporate strategic standards management into the system by each operational unit.

Each OU can use the checklist to address its own standards activities within the context of the OU's overall mission and strategic plan. In every case, it is advisable to closely link the standards checklist to the mission and goals of the OU/NIST/DoC. The checklist provides information for setting standardization goals and objectives that are linked to programs; developing budgets; setting priorities; making informed decisions about participation in developing standards; and using standards throughout the operational unit. NIST is in the midst of putting this guidance into use although some OUs are farther along than others.

Given the large number of standards development activities and the high cost of participation, in both dollars and time, each decision to participate in organizations and committees must match NIST's mission and goals. NIST currently participates in about 1,200 individual standards activities involving more than 300 staff positions. NIST should regularly evaluate the relevance of each activity to its mission and decide whether it is appropriate. To establish priorities for selecting standards activities, criteria from the document "Setting Priorities and Measuring Results at the National Institute of Standards

and Technology,” which was published in January of 1994, has been used to guide OUs when deciding which standards activities to pursue and support and which to sunset. The criteria, listed below, are described in more detail in the section on the checklist:

1. Knowledge of current standards activities
2. Magnitude and immediacy of the industrial need
3. Degree of correspondence (or fit) between a particular industrial need and the OU or NIST mission
4. Opportunity for OU standards participation to make a difference
5. Nature and size of the anticipated impact resulting from OU participation
6. OU capacity to respond in a timely fashion with a high-quality solution
7. Nature of opportunities afforded by recent advances in science and the technology to investigate and/or launch new standards activities
8. Ability to terminate standards activities deemed irrelevant to the OU or the NIST mission

The value of this approach may be defined as the best balance between the nature and size of the anticipated impact resulting from a given level of participation and the cost associated with that level or “return on investment”. Support may run the gamut from participating in research and development intended for eventual input into a standard, to serving on a board of directors of a standards organization, to chairing a committee, to serving on a committee, to lending subject matter expertise, to reviewing and editing documents, to administering a U.S. TAG, to attending a conference, or to simply observing the process. Each OU must decide on the value and level of effort appropriate for each activity.

Since standards activities differ within and among OUs, depending on missions and goals, each OU is encouraged to raise awareness of the OU’s strategic standards approach and soliciting contributions in developing their approach by communicating directly with its divisions and groups. It is important to communicate how OU goals or objectives relate to particular subject matter areas or industrial sector interests in standards.

## **A Checklist for Strategic Standards Management Implementation**

In order to measure progress (or its lack) in standards management, it is crucial to gather current information on standards activities at the OU level and their support mechanisms. The Office of Standards Services will collate OU information and create an annual NIST report on its implementation of strategic standards management. The OUs can use the following checklist to provide the needed information to OSS to establish a solid baseline of standards information. This checklist is meant to be representative rather than all-inclusive. Other questions could certainly have been posed, but we chose a subset of questions that would get everyone thinking strategically about their OU’s standards work as well as other activities that are currently being considered. The questions apply to the government’s budget fiscal year of October 1 to September 30.

## **Policy/Priorities:**

1. How does your OU keep informed about NIST policies, procedures, and guidance for participation in standards activities?
2. What is your OU's process for selecting and terminating standards activities?
3. Based upon your OU's program of work, what are the specific, key standards activities in which your OU is participating this year?
  - a. Of these, which standards activities are new?
  - b. What standards activities have been "sunsetting" by your OU this year?

## **Coordination (Policy and Technical, but primarily Technical):**

4. Who coordinates the standards activities for your OU as specified in his/her performance plan?
5. Who attends standards development meetings?
6. Who is responsible for ensuring that representatives are adequately prepared?
7. What are your OU procedures for ensuring that standards activity participants understand that they are representatives of NIST? For ensuring that those who work on international standards have access to and understand the rules for members of U.S. delegations, U.S. experts, etc. (e.g., the ANSI guide for U.S. delegates to IEC/ISO meetings)?
8. What are your OU's mechanisms for OU and NIST-wide coordination on standards positions?

## **Resources:**

9. How much does your OU spend on standards activities?
10. How do your OU program reviews and project selection take into account the necessary resource allocation for standards activities?
11. What is the projected return on investment for your standards activities?

## **Information/Training:**

12. Are your technical staff and management aware of the latest information available from NIST's standards library, the National Center for Standards and Certification Information, or the OSS website at <http://ts.nist.gov/oss>?
13. How does your OU learn of new relevant standards activities?
14. What resources are allocated for standards-related training (internal and external)?
15. Who conducts this training?

## **Next Steps**

It is advisable that management integrate and continually update the information discussed in the checklist into its current strategic process for work selection and resource allocation. In many cases standards activities support technical programs "hand-in-glove". Whether or not that is the case in every OU, the information on standards activities will provide new insights for the management process.

It is envisioned that completing the checklist would involve not only top management but also all staff involved in standards activities.

The information collected from the checklist, coupled with strategic standards management planning, will serve to demonstrate NIST's long-term commitment to standards activities. Each OU would determine the resources needed to support its work program, including time and cost requirements for adequate staff participation. Funding would also cover costs associated with developing and operating internal information management, a part of which would be the standards information. Standards resource allocation would include research in support of an existing or planned standard.

Management may also wish to consider implementing recognition programs to emphasize the high value that NIST and the OU place on standards activities. Staff would then be encouraged and feel empowered to participate in standards activities.

Determining the level of education or training needed for each standards-related activity for each OU will be a critical task. For example, an ISO standardization activity requires understanding of the ISO directives and the ISO process. Participants in standards activities related to their professional employment at NIST must be constantly aware that they are inseparably identified with NIST.<sup>3</sup> Consequently, they have a fundamental obligation to know and act in conformity with established policies and program objectives of NIST, DoC, and the Administration.

NIST coordinates and harmonizes with national and international standardization organizations and counterpart laboratories in other nations, establishing collaborative efforts in pre-standardization research and in the development of standards. NIST conducts training sessions, staff exchanges, and workshops to assist in the development of others' measurements and standards to be compatible with those in the United States. This is carried out in conjunction with ANSI and other cognizant domestic and foreign standards development organizations.

The Office of Standards Services will provide a short training module for new employees as a means of highlighting NIST's standards policy, standards activities, the function of the SAC, and an overview of the ANSI and private-sector voluntary standards processes.

Every two years, the Office of Standards Services' strategic planning process will review the NIST Standards Policy, the SAC charter, the checklist, and other relevant processes. When the SAC reviews its charter, it will evaluate its activities and attempt to correct any deficiencies, thus providing a continuous improvement cycle.

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<sup>3</sup> In some rare cases, an employee may be authorized to participate as an individual technical expert using his/her annual leave and personal finances. Even in these cases, however, the expert is likely to be perceived as associated with NIST.

## Summary

As this publication goes to press, NIST OUs are using strategic standards management to varying degrees. The next steps are to (1) increase the usage of strategic standards management; (2) identify issues that have arisen from using strategic standards management and the checklist; and (3) modify the checklist accordingly. Other agencies can and should modify the checklist to fit their specific standards needs and report to the Interagency Committee on Standards Policy on their success where appropriate.

In conclusion, NIST recognizes the important role that strategic standards management has played in the private sector, as well as the role it can play in the public sector. Through the Standards Advisory Committee, NIST will continue to implement strategic standards management. Each NIST OU will work with the checklist, refining it as the OU sets its own priorities and implements activities in support of the standards-related work associated with its mission. All of this is being carried out and will continue to be carried out in order to fulfill NIST's mandates from the Government Performance and Results Act and the National Technology Transfer and Advancement Act.

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## Endnotes:

[1] Collins, Belinda L., "The National Technology Transfer and Advancement Act – Plan for Implementation," NISTIR 5967, National Institute of Standards and Technology, January 1997.

[2] Betancourt, D., and Walsh, R., "The Evolution of Strategic Standardization Management," Standard View, Volume 3, No. 3, September 1995.

[3] Fisher, G.M., "Keynote Address, delivered at the American National Standards Institute Annual Conference," Chicago, IL, March 31, 1992.

[4] Camp, C.R., "Standards Management and Texas Instruments," ASTM Standardization News, December 1997.

# Appendix A: NIST Policy on Voluntary Standards

April, 1999

## Background

The National Institute of Standards and Technology (NIST) has the unique mission among Federal Agencies of promoting U.S. economic growth by working with industry to develop and apply technology, measurements, and standards. This policy document deals specifically with voluntary standards, sometimes called documentary or normative standards. Voluntary standards specify product characteristics, operation of a device, service or system, interface characteristics, material properties, measurement methods and procedures, and process management, among others.

The National Technology Transfer and Advancement Act (Public Law 104-113) and the most recent revisions of OMB Circular A-119 have given new impetus to NIST's traditional activities in voluntary standards and conformity assessment. Thus NIST and all Federal agencies are required to manage standards activities strategically by setting priorities that are appropriate to their overall missions and by effectively allocating staff and resources into high-priority areas. NIST has also been given the responsibility of coordinating the voluntary standards and conformity assessment activities of the Federal, state and local governments with those of the private sector.

## Policy Statement

To achieve voluntary standards that meet national needs in a timely fashion, NIST manages its standards activities strategically by setting priorities for voluntary standards activities appropriate to the overall NIST mission and by allocating staff and resources effectively.

## Implementation

1. NIST and its Operating Units (OUs) include voluntary standards activities within their overall strategic planning, and track progress in NIST program reviews. Each OU explicitly links its standards activities to the NIST and OU mission, and sets its priorities for individual activities accordingly. This should include deliberate selection of committee work that is most likely to result in standards used worldwide.
2. Each OU evaluates annually the relevance of its on-going and prospective standards activities, and commits to participating in the development and use of pertinent, voluntary standards as a key means of transferring NIST research. Each OU budgets personnel and resources during its normal planning process for these activities.
3. Staff Performance Plans identify relevant voluntary standards activities, including committee membership, chairmanships, secretariat services, authoring standards, and communicating key technical and policy issues to colleagues and management.
4. NIST values and rewards participation in standards activities and provides mechanisms for recognition of effective activity.
5. Through the Office of Standards Services and other NIST units, NIST provides leadership and support to facilitate more effective coordination of the voluntary standards and conformity assessment activities of the Federal, state and local governments with those of the private sector. NIST also works with standards bodies to improve the underlying tools, both procedural and electronic, to streamline the standards development process.

# Appendix B: Standards Advisory Committee Charter

## Background

The Office of Management and Budget (OMB) provides guidance for standards activities in the Federal Government through OMB Circular A119. This circular establishes policy to be followed by executive agencies for working with voluntary standards bodies and for adopting and using voluntary standards within their agencies. In particular, it directs the Secretary of Commerce, working through NIST, to ensure that agencies:

“Coordinate agency participation in voluntary standards bodies so that (1) the most effective use is made of agency resources and representatives; and (2) the views expressed by such representatives are in the public interest, and as a minimum, do not conflict with the interests and established views of the agencies”

The Interagency Committee on Standards Policy (ICSP) has been established to coordinate standards policy and activities at the executive level. Such coordination relies on input from the agencies and entities within each department, however. Under the ICSP, agencies are requested to develop and establish procedures to ensure that their employees who participate in voluntary standards bodies and standards-developing groups will determine the views of their agency, and do not express views that are inconsistent or in conflict with established agency policy. Furthermore, when two or more agencies participate in a given standards body, agencies are instructed to coordinate their views to present a single position, or at least mutually agree to recognize their differences. Agencies are instructed to report annually on the nature and extent of their participation in the development and utilization of voluntary standards.

The NIST Standards Advisory Committee has been re-established to implement the OMB Circular A119 within NIST, to coordinate voluntary standards activities and concerns across NIST, and to provide an efficient mechanism for information exchange among NIST professional staff on standards activities.

## Purposes

1. To advise the Director and OU Directors on issues relating to NIST participation in standardization activities.
2. To provide broad NIST representation in the development of recommendations for NIST standards policies and procedures, including mechanisms for setting priorities for participation in national and international standards activities
3. To provide a mechanism for NIST input into analysis of standards-related developments outside the Institute that have implications for NIST and to provide information to the ICSP as appropriate.
4. To assist the Director and OU Directors to ensure that NIST standards participation is effective and efficient and to encourage cooperation and the exchange of information among OUs concerning standards-related activities.

5. To ascertain and resolve potential conflicts within NIST or with other agencies on specific standards.

## **Functions**

1. To evaluate the effectiveness of the NIST information system for NIST and DOC participation in standards activities, to ensure that OMB requirements for information are met, and that proper input is made to the Directory of DOC Staff Memberships on Outside Standards Committees.
2. To develop guidelines for NIST participation in domestic and international standards activities and recommend them to the Director and the OU Directors, including development of criteria for prioritizing projects and activities.
3. To exchange information on activities of the standards organizations in which NIST employees participate, particularly where NIST policy input may be critical or where coordination with other Federal agencies is needed.
4. To provide a forum for assessing the effectiveness of policies and practices followed by NIST participants in standards activities.
5. To advise the Director and the OU Directors on the effect of outside standards activities on NIST, as well as on the Department and Federal Government as a whole.
6. To provide, when appropriate and timely, a coordinated NIST response to proposed standards policy initiatives and policy revisions developed in the public and private sectors.
7. To assist the NIST Director and OU Directors in maintaining a comprehensive awareness of NIST participation in the standards activities of private sector organizations and the effects of these activities on NIST and the outside organizations.
8. To evaluate the effects of OMB and other Administration directives on NIST standards activities and to advise the Director on the nature of any NIST response to such directives

## **Membership**

The committee shall serve at the pleasure of the NIST Director and consists of the following members: Director, (Office of Standards Services) and one representative appointed from each of the OUs.

The Director of the Office of Standards Services shall chair the Committee. A Vice-Chairperson shall be elected by the committee members and shall act in the absence of the chairperson. Committee members may designate an alternate to attend Committee meetings.

The Office of Standards Services shall provide staff support for the Committee, designating a staff member to serve as Executive Secretary.



## **Procedures**

1. The Committee shall meet at the discretion of the Chairperson, or on request of any member.
2. Matters for Committee consideration shall be coordinated through the Executive Secretary who, in cooperation with the Chairperson, shall establish a meeting agenda, circulate it in advance of the meeting, and maintain the necessary Committee records.
3. Plans and recommendations for action shall be coordinated with OU offices and other affected offices before the Committee forwards recommendations to the NIST Director or the NIST Executive Board.
4. The Committee shall submit an annual report to the NIST Executive Board within one month after the end of the calendar year.





