

Federal Agencies Participation in the Development and Use of Voluntary Standards

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I. PURPOSE

As part of its efforts at regulatory reinvention and reform, the U.S. Environmental Protection Agency (EPA) is interested in how other Federal agencies participate in the development and use of voluntary standards. Federal agencies, including EPA, have actively participated in and incorporated voluntary standards into procurement efforts and regulations for decades. The increased use of voluntary standards is driven by both internal government reinvention and reform efforts as well as by recent Federal law. This review is pertinent at present because of the codification of the Office of Management and Budget (OMB) Circular A-119¹ in the National Technology Transfer and Advancement Act of 1995 (NTTAA) (PL 104-113).² The Act requires Federal agencies to use technical standards developed or adopted by voluntary consensus standards bodies that are consistent with their missions, and to submit yearly reports on their progress in this regard. EPA can obtain valuable information from a review of the experience and suggestions of other Federal agencies who have participated in standards development efforts.

The purpose of this report is threefold:

1. Review participation of Federal agencies in the development of voluntary standards and in standards bodies;
2. Review use of voluntary standards in regulatory and procurement activities by Federal agencies; and
3. Identify essential program elements that support implementation of the provisions of the NTTAA and OMB Circular A-119.

II. INTRODUCTION

For over four decades, voluntary standards have been used by Federal agencies in their regulatory and procurement activities. Committed to regulatory reform, the Clinton Administration and Congress have enacted the necessary requirements in recent years to ensure utilization of appropriate voluntary standards by Federal agencies.

On October 20, 1993, OMB issued a revised Circular A-119 entitled, "*Federal Participation in the Development and Use of Voluntary Standards*." OMB Circular A-119 establishes the policy for participation of Federal employees in the development of technical standards and the use of voluntary standards by Federal agencies. In addition, OMB Circular A-119 delegates to the Secretary of Commerce the responsibility for coordinating implementation of the circular's policies among the Federal agencies as well as establishing an interagency consultative mechanism to "provide for participation by all affected agencies and ensure that their views are

¹ <http://www.whitehouse.gov/WH/EOP/OMB/html/circulars/a119/a119.html>

² <ftp://ftp.loc.gov/pub/thomas/c104/h2196.enr.txt>

considered." Importantly, the circular requires that the Secretary of Commerce report to OMB regarding its implementation. On December 27, 1996, OMB proposed revisions to the 1993 version of Circular A-119³ to reflect Section 12(d) of the NTTAA; the public comment period on the proposed revisions closed on February 25, 1997.

On March 7, 1996, President Clinton signed the NTTAA. Under the Act, Federal agencies are required to:

Use technical standards that are developed by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies or departments...Federal agencies and departments shall consult with voluntary, private sector, consensus standards bodies and shall, when such participation is in the public interest and is compatible with agency and departmental missions, authorities, priorities, and budget resources, participate with such bodies in the development of technical standards.

The Act specifically directs the National Institute of Standards and Technology (NIST),⁴ part of the Department of Commerce (DOC):

To compare standards used in scientific investigations, engineering, manufacturing, commerce, industry, and educational institutions with the standards adopted or recognized by the Federal government and to coordinate the use by Federal agencies of private sector standards, emphasizing where possible the use of standards developed by private, consensus organizations.

In January 1997, NIST submitted *The National Technology Transfer and Advancement Act - Plan for Implementation*⁵ to Congress. The plan, required by the Act, specifies the activities NIST will undertake or oversee in fulfilling its legal mandate. The plan calls for NIST to prepare two reports to Congress that summarize: (1) Federal agencies' use of voluntary standards and conformity assessment mechanisms and (2) participation of Federal agencies staff in the development of voluntary standards, respectively. NIST will provide leadership and guidance to the Federal agencies in their standardization activities through the Interagency Committee on Standards Policy (ICSP),⁶ which it chairs.

Originally established in 1968 to encourage coordination among Federal agencies with regard to standards, the Secretary of Commerce reconstituted the ICSP in 1992 to serve a similar role. The ICSP seeks:

To promote effective and consistent standards policies in furtherance of U.S. domestic and foreign goals and, to this end, to foster cooperative participation by

³ <http://www.whitehouse.gov/WH/EOP/OMB/html/fedreg/a119rev.html>

⁴ <http://www.nist.gov>

⁵ <http://ts.nist.gov/ts/htdocs/210/plan.htm>

⁶ <http://ts.nist.gov/ts/htdocs/210/215/icspdes.htm>

the Federal government and U.S. industry and other private organizations in standards activities, including the related activities of product testing, quality system registration, certification, and accreditation.

Considerations for EPA:

The NTTAA and OMB Circular A-119 establish new requirements for Federal agencies. In order to achieve and maintain compliance with these requirements, Federal agencies need to address the following policy and programmatic issues:

- Publish a clear agency policy on voluntary consensus standards. Develop clear objectives concerning the agency standards program.
- Develop an effective organization, with the capability to coordinate agency internal and external standards activity. Delineate specific roles, responsibilities, and accountabilities to implement agency policy.
- Understand the human and financial resource requirements and commit adequate resources to implement the agency standards policy and meet program objectives.
- Develop sufficient organizational infrastructure and support (procedures, guidance manuals, employee awareness and training, information management systems) to support meeting the agency standards policy and objectives. Utilize this infrastructure to effectively meet agency statutory and other commitments (NTTAA, OMB Circular A-119, etc.).
- Establish mechanisms for tracking program implementation, taking corrective action when necessary to assure that program objectives are obtained.

III. FINDINGS

A prevalent trend across Federal agencies is an increased reliance on voluntary standards. NTTAA and OMB Circular A-119 are the legal forces driving this trend. Nevertheless, important factors outside legal mandates must also be taken into account; these factors include ongoing regulatory and procurement reform initiatives and reduced Federal agency budgets.

This report is based on discussions with staff from 10 Federal agencies and two Standards Developing Organizations (SDOs) (see Appendix 1) and the supporting documents they provided form the basis of this investigation and the initial findings in this section. The findings described below highlight areas of particular interest to the establishment and implementation of an agency's voluntary standards program. Where possible, specific agency policies and practices are referenced.

FINDING #1:

To an increasing degree, Federal agencies have participated in the development of a significant number of voluntary standards, subsequently adopted into Federal procurement and regulatory activities. There was an unmistakable trend toward the utilization of the voluntary standards-development process even prior to the NTTAA.

Nearly 3,000 voluntary standards were adopted into federal procurement and regulatory documents during the last two fiscal years. The table below presents data on the number of voluntary standards adopted by various Federal agencies, where the agencies participated in the development of the standards. These data are contained in the NIST Annual Report to OMB for FY 1995 and the draft version of the FY 1996 Annual Report.

Agency	Number of Voluntary Standards Adopted by Agency	
	FY 95	FY96*
Archives	3	7
CPSC	5	
DoD	1171	566
DOE	15	0
DOT	3	277
FCC		2
GSA	53	25
GPO	2	
HHS	365	306
HUD	30	25
DOJ	1	
DOL	10	12
NASA		25
NRC	3	18
Treasury	7	15
USDA	1	
VA	1	7

* Information provided in this column is draft; not all agencies have submitted this data to NIST.

The Department of Defense (DoD), the Department of Energy (DOE), and the General Services Administration (GSA) experienced reductions in the number of voluntary standards adopted over the two time periods despite their well-developed standardization programs. In fact, such a reduction may be a direct result of the progress achieved by their standardization programs in previous years. As more procurement-related documents are transferred to non-governmental standards bodies, fewer specifications remain "in the queue." DoD, for example, has adopted over 7,400

non-governmental standards and has identified only some 2,000 current military specifications remaining with the potential to be transferred to voluntary standards.

The Department of Transportation (DOT), National Aeronautics and Space Administration (NASA), and the Nuclear Regulatory Commission (NRC), on the other hand, showed marked increases in the number of standards adopted. Such increases may reflect a trend among regulatory agencies as they move to establish structured voluntary standards programs to implement the provisions of the NTTAA.

Considerations:

- Agencies that have not yet done so will need to develop a more structured voluntary standards program to accommodate the requirements of the NTTAA.
- There is considerable experience and expertise within the Federal government to guide agencies in the development and improvement of their voluntary standards programs.
- The elements of such a program, including policies, organization, resource allocation, infrastructure development, implementation and management effectiveness reviews are described in Section IV.

FINDING #2:

Most Federal agencies have regularly consulted with and/or participated in a relatively small number of Standards Developing Organizations (SDOs), principally those related to their Agency mandates.

The following exhibit identifies the organizations with which a listed agency regularly coordinates on standards-related activities, either by:

- adopting or using standards developed under the purview of the SDO;
- contributing to the development of standards by the SDO;
- transferring agency governmental standards to the SDO; or
- otherwise consulting with the SDO for standards-related purposes.

The exhibit shows that Federal agencies, both separately and collectively, tend to consult with and/or participate in a relatively small number of SDOs.

Agency	Principal National Standards Bodies and SDOs by Agency
DOE	ANSI, ASTM, NFPA, ANS, UL, ASME, ASHRAE
DOD	ANSI, ASTM, NFPA, AIAA, SAE, IEEE, AWS
NRC	ANSI, ASTM, ANS, IEEE, HPS, ASME, ASCE
DOT/CG	ANSI, ASTM, SAE, ASME
DOT/ITS	SAE, ASTM, IEEE, AASHTO, ITE
OSHA	ANSI, ASTM, NFPA, ASSE, NSC, API, CMA
CPSC	ANSI, ASTM, UL
NASA	ANSI, ASTM, SAE, ASME, AIAA
GSA	ANSI, ASTM, ASQC
FDA/CDRH	AAAI, AABB, AACC, ADA, AHA, AIUM, ANSI, APA, ASTM, AAMI, CGA, HIMA, IESNA, IEEE, ICSH, IEC, ISO, NCCLS, NEMA, NCRPM, NFPA, NSF, OMA, RESNA, UL

* See Appendix 3: List of Acronyms

This practice is driven in large part by the need to spend available government resources cost-effectively, since participation in standards-development activities with an organization can incur a variety of costs to the Federal agency (e.g., travel costs, SDO membership dues, and seed money). It also is driven by the nature of expertise available at a typical SDO and the interests of the agency:

- Some SDOs (e.g., American Nuclear Society (ANS)) are dedicated to developing standards to meet the needs of a particular industry sector. An agency coordinates with such an SDO when the industry sector coincides, either wholly or partially, with the universe an agency governs or whose services or products that agency uses.
- Other SDOs (e.g., American Society of Testing and Materials (ASTM)) develop standards for multiple industries or that are cross-cutting (e.g., standards that affect many industry sectors). By coordinating with such an SDO, an agency can benefit from a considerable number and range of standards and expertise, for a limited cost of participation. It can also promote wide recognition and distribution of the resulting standards into the multiple sectors associated with the SDO.

In contrast to the finding, the Center for Devices and Radiological Health (CDRH) at the Food and Drug Administration (FDA) participates in a wide range of SDOs. CDRH develops and implements national programs to protect public health in the fields of medical devices and radiological health. These efforts encompass activities conducted by a broad range of SDOs, including 26 national organizations and 10 international.

Considerations:

- Agencies should consider funding specific projects to obtain the maximum benefit from their SDO involvement.

- Agencies should evaluate opportunities to transfer governmental standards to SDOs for adoption as voluntary standards.

FINDING #3:

Federal agencies have developed and adopted varying policies concerning their use of voluntary standards, which creates different standards practices among agencies.

The NTTAA and OMB Circular A-119 require Federal agencies to use consensus standards in achieving their missions, without specifying how the agencies shall accomplish this requirement. This approach provides Federal agencies with the flexibility to comply with standards in a manner most consistent with and suitable for accomplishing their missions. Inevitably, this has resulted in the development and adoption of different policies and practices among Federal agencies. There is a significant difference in the development and use of voluntary standards between agencies which primarily use voluntary standards for procurement and those who use standards primarily in regulatory functions.

Many, but not all, Federal agencies have published policies on participation in the development and use of voluntary consensus standards in their regulatory and/or procurement activities. A number of agency policies are described below.

- DoD's adoption policies have been in place for over 30 years: as part of DoD's military-commercial integration efforts, DoD activities are directed to use non-governmental standards to the fullest extent practicable to fulfill their acquisition needs. The passage of OMB Circular A-119 reinforced these existing efforts. Subsequently, DoD drafted new standards policies in the Defense Standardization Manual (DoD 4120.3-M). The new procedures make adoption a one-time event; that is, once a standard is adopted, all future updates will automatically be adopted. Adoption status may be rescinded at a later date if revisions cause a standard to fail DoD's requirements. Further, the new procedures deem usage of existing standards, by default, equal to adoption.
- DOE fortified its policies concerning use of consensus standards in the 1990s. While DOE's original policy on standards lacked strong advocacy by top management, the Energy Secretary issued a new policy in 1991 that strongly endorsed: (1) the use of consensus standards for successful implementation of DOE's mission and (2) the use of consensus standards wherever applicable. Similar to DoD's policy, DOE's policy expedites adoption of a consensus standard. Consensus standards that are referenced in DOE Orders are considered adopted without further action. Alternatively, standards may be adopted by the publication of an adoption notice. Adoption also is one-time and approval of standards also may be withdrawn.

- The Food and Drug Administration (FDA) has been involved in standards activities for 20 years. Since 1977, the FDA has had provisions in place (21 CFR 10.95) covering the participation by FDA employees in standards-setting activities outside the agency. On October 11, 1995, the FDA published a standards policy addressing conditions under which the FDA will participate with national and international standards bodies outside of the FDA and the conditions under which the FDA intends to use the resultant standards in fulfilling its statutory mandates for safeguarding the public health. To further clarify agency standards policy, the FDA published on February 27, 1997 a document entitled "Good Guidance Practices," which sets forth the agency's policies and procedures for the development, issuance, and use of FDA guidance documents containing references to standards. FDA's policy stipulates that FDA is "not bound to use standards developed with FDA participation."
- The Occupational Safety and Health Administration's (OSHA)⁷ policy concerning standards use is found in the Occupational Safety and Health Act of 1970 (PL 91-596):⁸

Whenever a rule promulgated by the Secretary differs substantially from an existing national consensus standard, the Secretary shall, at the same time, publish in the Federal Register a statement of the reasons why the rule, as adopted, will better effectuate the purposes of this Act than the national consensus standard.

- The Consumer Product Safety Commission's (CPSC) policy concerning standards use is found in the Consumer Product Safety Act of 1972 (PL 92-573):

The Commission shall rely upon voluntary consumer product standards rather than promulgate a consumer product safety standard prescribing requirements in subsection (a) [performance requirements, requirements that a consumer product be marked with or accompanied by clear and adequate warnings or instructions, or requirements respecting the form of warnings or instruction] whenever compliance with such voluntary standards would eliminate or adequately reduce the risk of injury addressed and it is likely that there will be substantial compliance with such voluntary standards.

Considerations:

DOE, DoD, and FDA/CDRH standards programs are furthest along in implementing the requirements of NTTAA and OMB Circular A-119 concerning use of voluntary standards. Based upon their experience, effective policy concerning use of consensus standards should consider the following key elements:

⁷ <http://www.osha.gov>

⁸ http://www.osha-slc.gov/OshAct_data/100006.html

- Strong commitment and advocacy by top management to ensure progress;
- Development of specific goals and objectives of the standards program, appropriate to the procurement and regulatory objectives of the agency;
- Legal requirements with which a program must comply;
- Designation of a Standards Executive position, to coordinate the development of specific program policies and implementing procedures; and
- Commitment to support the development and implementation of the program.

FINDING #4:

The rulemaking requirements of the Administrative Procedures Act (APA) have inhibited Federal executive branch agencies from regularly updating voluntary consensus standards referenced in regulations.

The standards updating policies of regulatory and procurement agencies significantly differ in large part due to the rulemaking requirements of the APA (5 USC 553). The rulemaking provisions established in the APA delineate a detailed process with which regulatory agencies must comply. Specifically, the APA dictates minimum requirements for public notification and comment in the rulemaking process. In order for a regulatory agency to adopt an updated standard into a specific regulation, the process set forth in the APA must be followed. This is a potentially lengthy and resource-intensive process, which, in some cases, has had the effect of agencies leaving outdated standards in place rather than embarking on a rulemaking. In many instances, revisions to voluntary standards often reflect the newest technology and information available, rather than substantive modifications to the compliance requirements.

Procurement Activities

GSA and DoD, which primarily use standards in procurement, are relatively free from the APA's burden, thus enabling them to establish a more effective means to incorporate revisions to adopted consensus standards. GSA's *Federal Standardization Manual* directs "when referencing the voluntary standard the issue date is not cited in the FPD [Federal Product Description], unless a specific issue of the voluntary standard is needed." By establishing such a policy, GSA has implemented an automatic updating process, with exceptions as necessary. Similarly, DoD has implemented an automatic standards updating process. *The Defense Standardization Program (DSP) Policies & Procedures*⁹ specifies:

⁹ <http://guardian.ncr.disa.mil:1600/spd/spd4120.htm>

Adoption is a one-time event, so it is not necessary to adopt updates for adopted NGSs. [DoD refers to consensus standards as non-governmental standards (NGSs)]...While this automatic adoption procedure ensures the availability of the latest NGS issues for DoD, it is not a substitute for participation and awareness on NGS technical committees. The Adopting Activity [the DoD technical focal point for adopted NGSs] must ensure that DoD requirements are met by any NGS updates. Should an occasion arise when an adopted NGS does not meet the DoD needs, adoption should be withdrawn.

Regulatory Activities

The APA essentially inhibits regulatory agencies from adopting such automatic updating procedures. If a standard referenced in a regulation is updated by the SDO but the citation in the regulation does not change to reflect this, confusion is created as the regulated community does not know which standard should be followed — the most up-to-date standard or the one referenced in the regulation.

Several agencies have developed alternative approaches to address this problem:

- OSHA implicitly allows industry to comply with the most current issue of a standard referenced in a regulation if that standard provides equivalent or greater safety than the baseline established in the regulation. OSHA compliance officers make such determinations in the field on an individual case basis.
- DOE, which has both procurement and regulatory authorities, has also exercised a resourceful approach to incorporating updated standards into select policies. DOE often establishes performance standards in regulations and references corresponding voluntary consensus standards in their guidance documents. Therefore, the Department can revise their guidance documents, incorporating an updated standard, without exposing the referring regulation to the provisions of the APA. However, guidance is generally not binding to the same degree as a regulation.
- FDA's policy concerning use of voluntary standards includes incorporating standards into guidance documents, compliance policy guides, or serving as a memorandum of understanding with national and international governments. FDA also can use voluntary standards to serve as the basis for mandatory standards in their regulations. The CDRH also tends to incorporate standards into guidance documents since the technology the Center regulates changes rapidly. Keeping pace with such changes through rulemakings would be resource-intensive. In addition, CDRH has used standards for conducting reviews of applications for products, conducting reviews of manufacturing test protocols used by firms, and conducting reviews of market study protocols used by firms.

Several Federal agencies have considered using the "direct and final" rulemaking approach in order to circumvent the time and resource intensive activities associated with the APA. Using the "direct and final" approach, agencies forgo the formal rulemaking process, including the public comment period and comment response, and directly issue the regulation. With one substantive complaint or challenge to the regulation, however, the agency must initiate the formal rulemaking procedures of the APA.

Considerations:

Agencies, especially those that use voluntary standards in regulations, need flexibility to adopt revisions to those voluntary standards. Some alternatives to accomplish this include the following:

- Reference voluntary standards in guidance documents rather than regulations;
- Attempt to update voluntary standards in regulations through the "direct and final" approach; and
- Investigate coordinating the Federal and SDO public comment processes to expedite adoption of revised voluntary standards in regulations.

***FINDING #5:
Policies for participation in voluntary standards bodies
have varied among Federal agencies.***

OMB Circular A-119 calls for the Federal Government in its procurement and regulatory activities to:

Coordinate agency participation in voluntary standards bodies so that...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.

Accordingly, this provision furnishes Federal agencies with flexibility to establish agency-specific policies for employee participation in voluntary standards bodies. For example, the current draft of the directive governing NASA's standards policy, delegates NASA Centers with the responsibility to:

Encourage, support and authorize the participation of employees in voluntary consensus standards activities which are in furtherance of NASA's mission.

The resulting policies governing agency participation in standards development tend to differ in four areas:

- Eligibility for participation;
- Serving as a standards development committee chairperson;
- Voting in committees and subcommittees; and
- Membership in and participation on SDO boards.

1. Eligibility

Some of the participation policies exclude the participation of certain agency personnel on voluntary standards bodies. For example, the OSHA directive governing participation (ADC 1.1), *OSHA Personnel Participation on Voluntary Standards Organizations Committees in the Development and Writing of Occupational Safety and Health Standards*,¹⁰ states:

OSHA personnel charged with the responsibility and authority for setting OSHA policy or rendering the final decision regarding occupational safety and health standards shall not participate in the development of voluntary standards. Other OSHA employees may participate and attend meetings of selected committees concerning occupational safety and health.

Similarly, CPSC excludes certain employees, including its Commissioners, from participation in voluntary standards bodies because of their integral role in establishing the agency's policy and regulatory priorities. Other agencies, such as DoD and DOE, do not specify such exclusions.

2. Service as a Committee Chairperson

Another differentiating issue among agency participation policies is whether an agency representative can serve as a committee chairman. The OSHA directive governing participation explicitly prohibits such service:

OSHA personnel shall not direct the committee's course, such as serving as committee chairperson or as secretary, or assume responsibilities that would dominate the nature of the committee's technical output.

Prior to 1982, Nuclear Regulatory Commission (NRC) followed a similar policy; however, the agency now permits its employees to serve in such a capacity. Other agencies, including DoD, NASA, and DOE, also allow for their employees to serve as committee chairpersons. Regardless of whether employees can serve as chairpeople,

¹⁰ http://www.osha-slc.gov/OshDoc/Directive_data/DIRECT_19781030Ai.html

all agencies operate under the provisions of OMB Circular A-119, which caution agency personnel against assuming dominant positions on the committees.

3. Voting on Technical Committees

Agencies also differ in whether their personnel may serve as voting members of the committee. CPSC and OSHA explicitly prohibit their employees from exercising voting privileges:

OSHA personnel shall serve only in a non-voting advisory capacity. They shall indicate that their suggestions or recommendations do not imply OSHA approval of a voluntary standard or part of a standard.

NRC specified that its employees vote as individuals and not on behalf of the agency. The official letter nominating the NRC representative to a committee specifies that staff participation "does not connote agency agreement with committee decisions." Therefore, NRC representatives exercise their limited voting powers by either abstaining or voting against the measure. CPSC staff noted that their employees are encouraged to "abstain with comment" from voting in order to further disseminate and officially record the agency's position. DoD and DOE, on the other hand, are two agencies that do not restrict the voting rights of their representatives on standards developing bodies.

4. Membership on SDO boards

Several Federal agencies allow their employees to serve on SDO boards, in accordance with the provisions of OMB Circular A-119:

Participation by agency representatives in the policymaking process of voluntary standards bodies, in accordance with the procedures of those bodies, is encouraged — particularly in matters such as establishing priorities, developing procedures for preparing, reviewing, and approving standards, and creating standards-developing groups. In order to maintain the private, nongovernmental nature of such bodies, however, agency representatives should refrain from decisionmaking involvement in the internal day-to-day management of such bodies.

Participation Levels

The following table contains information on the number of agency employees participating in at least 1 standards developing group for Fiscal Year 1995 and as of December 1996. These data are contained in the NIST Annual Report to OMB for FY 1995 and the draft version of the FY 1996 Annual Report.

Agency	Number of Employees Participating in at Least One Standards Developing Group	
	FY 95	As of December 96
Archives	15	14
CPSC	23	21
DOC	459	520
DOD	>2200	>2200
DOE	846	848
DOT	9	420
EPA	270	not available
FCC	32	100
GSA	51	32
GPO	12	12
HHS	207	330
HUD	7	7
DOL	6	not available
DOJ	25	26
NASA	138	139
NSF	4	3
NRC	170	163
State	2	not available
Treasury	50	40
USDA	42	43
VA	11	16

Considerations:

- Establish policy governing participating in standards developing bodies, specifying employee eligibility, service capabilities, and voting capacity.
- Encourage employees to abstain with comment when abstaining from voting.

FINDING #6:

Agencies differ significantly in preparing their staff to participate in standards-related activities.

Agencies have adopted different approaches to preparing their staff members to participate in standards-related activities. Staff training and development provided may address one or more of the following activities: the use and availability of voluntary standards; participation in intra- and inter-agency standards activities; involvement as an agency member of a standard development committee; and membership on the board committee of a standards body.

Some agencies train their staff on effectively participating in standards-related activities. For example:

- DOE provides staff training on how to participate in standards-related activities. Such training may be used to increase awareness, understanding, and active use of and participation in standards activities of interest to DOE. Through in-house programs, DOE trains some of its key players on how to interact with other stakeholders and how to identify, use, and prepare technical standards for accomplishing DOE's mission. DOE administers training through a number of methods, including workshops, discussion forums, and instructional materials (e.g., the "Standards Tool Kit" developed for the DOE Technical Standards Program).
- FDA has provisions (21 CFR 10.95) covering participation by FDA employees in standards-setting activities. FDA also participates in training provided by SDOs with which the agency works (e.g., UL). Further, as part of FDA's "Good Guidance Practices (GGPs)," the agency "will provide all current and new FDA employees involved in the development, issuance, or application of guidance documents a copy of the GGPs," which include a section that describes the legal effect of guidance. FDA will direct these employees to review the GGP's and will provide additional training that describes, in more detail, how to develop and use guidance documents.
- DoD has purchased several units of training from the American National Standards Institute (ANSI) for personnel involved in its Defense Standardization Program. This training, available through ANSI's Education and Training Services, provides instruction to Federal personnel on how to participate in standards development activities.
- EPA provided ANSI a special grant to develop education and training materials related to environmental management standards.
- Standards organizations, such as ANSI and ASTM, indicated that other Federal agencies also have expressed interest in receiving training from SDOs related to use of and participation in standards development; in addition, some agencies may be in the process of developing in-house training.

Those agencies that do actively incorporate training into their standards program practices (e.g., DoD and DOE) emphasize that training is critical to promoting the progress and quality of programs they have in place to support their standards initiatives. In particular, training is credited with attaining the following three key objectives:

- Ensuring that a consistent standards policy is known and applied across an agency;

- Ensuring that agency staff know how to participate effectively with other stakeholders and understand the rules governing voluntary consensus standards development and the agency's role in such development (i.e., "equal partner" approach to standards); and
- Promoting commitment to agency initiatives by educating its staff on the importance, value, use of, and participation in the development of voluntary standards.

Considerations:

- Given the requirements of the NTTA and OMB Circular A-119, investment in awareness and training may increase an agency's utilization of voluntary standards, enhance their level and degree of participation in standards-setting activities, and improve the quality of final standards developed and their utility to the agency.
- Agencies can profit by reviewing the voluntary standards-related awareness and training programs of other agencies and SDOs before developing their own programs or revising existing programs.

FINDING #7:

Federal agencies differ greatly in how they are internally organized to support their participation in standards-related activities.

Supporting infrastructure is the cornerstone of success of any agency's standards program. At this time, however, relatively few agencies have a well-developed and comprehensive program in place to support their standards-related activities. As agencies are ramping up their standards activities in response to the requirements of NTTAA and OMB Circular A-119, it is useful to examine the design of an existing program to better understand which key elements comprise infrastructure essential to standards-related Federal programs.

Among agencies with a more established program, DOE attributes its progress to date concerning use of and participation in the development of voluntary standards to strong commitment from top management. This commitment ensures that the necessary personnel and financial resources are available to develop the appropriate organizations, procedures, communication networks, and information systems within DOE to support its standards activities. Key elements regarding the design of DOE's program infrastructure are highlighted below:

- DOE's Technical Standards Program organizes its participants into a hierarchy of individuals and committees with well-defined roles and responsibilities.

- The organization, roles, and responsibilities establish a network for communicating within the program and for discharging tasks.
- Participants are drawn from different staff levels, with senior level DOE officials to provide leadership and management and subject-matter experts to focus activities at the working level.
- Participants in the Technical Standards Managers' Committee represent every DOE headquarters program office, DOE operations and field office, and contractor organization.
- Managers and committee members participate proactively through periodic meetings and forums.
- The Technical Standards Program establishes clear procedures and mechanisms for:
 - accessing procedures and guidance;
 - tracking participation;
 - tracking adopted standards;
 - tracking updates to adopted standards;
 - tracking standards for potential use;
 - providing staff training;
 - obtaining and exchanging documents;
 - managing and disseminating information; and
 - coordinating with stakeholders.

DOE strategically employs electronic systems throughout its program. Databases are used to manage large amounts of information, such as training materials, standards, and other documents. The Technical Standards Home Page harnesses the World Wide Web to broadly disseminate program documents and other information.

Considerations:

Agencies may wish to benchmark their current standards practices and infrastructure against other agencies and adopt best-in-class practices. In addition, the following steps can facilitate more effective participation in development of voluntary standards and use of existing and forthcoming standards:

- Provide employees with access to available voluntary standards.
- Develop procedures and guidance materials governing eligibility and capacity for participation in standard developing bodies.

- Develop guidance defining roles and expectations of agency personnel involved in standards development activities.
- Write and disseminate procedures and guidance materials governing the processes for adopting voluntary standards (in whole or in part), tracking adopted standards, and updating adopted standards.
- Build information management systems to support intra-agency coordination as well as coordination with other Federal agencies and SDOs.

FINDING #8:

Federal agencies have both developed and have access to numerous tools to provide their employees with information on standards available from SDOs, the standards development process, key internal and external contacts, and current agency activities.

Under OMB Circular A-119, "voluntary standards that will serve agencies' purposes and are consistent with applicable laws and regulations should be adopted and used by Federal agencies..." Accordingly, many Federal agencies have established voluntary standards policies to comply with this provision (see Finding #3). Federal employee access to voluntary standards information is crucial for effective implementation of the OMB Circular. Specifically, Federal employees must have access to information on available standards to avoid initiating duplicative efforts where an existing standard is consistent with applicable laws and regulations.

Federal agencies employ various tools to provide their employees with access to voluntary standards information. In general, these resources are electronic and include:

- **Federal agency Internet Web sites.** Several Federal agencies reference their standards programs on their home pages. Others have dedicated separate home pages to their standardization programs and standards resources. These include: NASA;¹¹ DoD;¹² DOE¹³, FDA/CDRH,¹⁴ and DOT/ITS.¹⁵ These sites are also used to facilitate electronic review of standards within the agency.
- **SDO Internet Web Sites.**¹⁶ SDOs (e.g., ASTM,¹⁷ Society of Automotive Engineers (SAE),¹⁸ ASQC,¹⁹ and ASME International²⁰) frequently have their

¹¹ <http://standards.nasa.gov>

¹² <http://www.acq.osd.mil/es/std/stdhome.html>

¹³ <http://apollo.osti.gov/html/techstds/techstds.html>; <http://www.explorer.doe.gov>; <http://www.dsc.doe.gov>

¹⁴ <http://www.fda.gov/cdrh/mdsar.html#contents>

¹⁵ <http://www.its.dot.gov/standards>

¹⁶ <http://www.ansi.org/resource.html#Dev>

¹⁷ <http://www.astm.org>

¹⁸ <http://www.sae.org>

own Internet web sites, which Federal employees can review for information. Federal agencies, such as GSA and OSHA, rely on these SDO web sites to provide their employees with voluntary-standards-related information. Lists of SDO resources on the web can be found on both the web sites of Federal agencies and SDOs. ASTM is currently experimenting with an electronic standards development process which may reduce the costs of standards development and facilitate Federal agencies participation.

- **National Standards System Network (NSSN).**²¹ NSSN is a new Internet resource developed by NIST and ANSI. NSSN consolidates comprehensive information on regional, national, and international standards developed and under development by private-sector organizations and Federal government agencies. By year's end, NSSN will include information on more than 100,000 standards. NSSN also serves as a gateway for accessing the vast network of standards developers, providing search capabilities and links to their heterogeneous databases. NSSN has both a free gateway for referencing and browsing, as well as a fee only access to the standards. The Enhanced Standards Alert Service, available for a fee, can be used to obtain daily notification about standards of interest to the user that are being initiated, reviewed, revised, or approved. Federal agencies mentioned that they see this resource as providing key information in a readily accessible form.
- **Information Handling Services (IHS).**²² This is a commercial integrated database available on CD-ROM and on-line (by subscription) that includes military specifications and standards and worldwide industry standards. Its index includes more than 100,000 standards. CPSC, for example, uses IHS as a primary tool for providing employees with voluntary standards information.
- **National Center for Standards and Certification Information (NCSCI).**²³ This office within NIST serves as a clearinghouse and referral service for information on U.S., and international voluntary standards; government regulations; and rules of conformity assessment for non-agricultural products. NCSI can be contacted for standards and standard-related information at (301) 975-4040.
- **Acquisition Streamlining and Standardization Information System (ASSIST).** ASSIST is an electronic catalog that includes, among other documents, DoD-adopted non-government/industry specifications and standards. Both government (DoD and NASA) and industry use ASSIST to gain information on voluntary standards.

¹⁹ <http://www.asqc.org>

²⁰ <http://www.asme.org>

²¹ <http://www.nssn.org>

²² <http://www.ihs.com>

²³ <http://ts.nist.gov/ts/htdocs/210/217/bro.htm>

Interestingly, while there are considerable resources available on the Internet, some Federal standards employees do not have access to the Internet. This is a significant deficiency for the development of an effective standards program.

Considerations:

- Agencies seeking to develop and improve their standards programs can review the abundant information resources currently available on the Internet, prior to developing new information resources.
- Agencies can provide Internet access to staff involved in standards-related activities.
- Internal agency intranets can assist in electronic standards development and review, which can reduce the costs of involvement and simultaneously increase participation and standards quality.

FINDING #9:

With some notable exceptions, Federal agencies do not have well-developed systems to track (1) voluntary standards they have adopted or referenced; and (2) employee participation in voluntary standards developing bodies.

Adopted Voluntary Standards

Most Federal agencies lack formal mechanisms to track standards adopted into their procurement and regulatory documents. Of noteworthy exception are:

- **ASSIST.** DoD's integrated electronic database, which includes DoD-adopted non-government/industry specifications and standards.
- **DOE's Technical Standards Home Page.** DOE's Technical Standards Home Page serves as the agency's clearinghouse for standards adopted by the agency.
- **NRC Inventory.** An inventory, compiled by Pacific Northwest National Laboratories, listing all the voluntary standards incorporated in NRC documents and the status of the standards.

An effective tracking system will complement the process of updating adopted standards.

Employee Participation

OMB Circular A-119 requires "...the development and harmonized implementation of an agency-wide directory identifying employees participating in standards developing groups." This current study found that the Department of Commerce (DOC), DoD, DOE, FDA/CDRH, DOT/ITS have developed database directories implementing the OMB Circular A-119 provision.

The ICSP working group on directory databases developed *Guidelines for Development of Harmonized Federal Agency Directories*. The guidelines detail the purpose of an agency directory and encourage interagency cooperation in directory development. "Common database elements will ensure the users will be able to identify and find the information they need."

Every year, Federal agencies are required to provide NIST with the number of employees participating in standards developing committees for the Annual Report to OMB. DOC, DoD, and DOE can use their directories to provide this information. Other Federal agencies track employee participation through biannual, rather informal, requests to employees to report their participation in voluntary standards bodies.

SDOs may also be a resource for agencies to track participation in voluntary standards bodies. Upon request, certain SDOs can produce a list of committee representatives for a specific Federal agency.

Considerations:

- Agencies may find it useful to design a system to automate the tracking of voluntary standards adopted in their procurement and regulatory activities.
- Agencies can use the ICSP working group's *Guidelines for the Development of Harmonized Federal Agency Directories* when creating a system to compile and update an agency directory.

FINDING #10:

Funding issues have hampered Federal agency participation in standards development activities and the conversion of governmental standards into voluntary standards.

Several agencies and SDOs identified lack of funds as a factor that hampers both Federal agency participation in the standards development process and the conversion by SDOs of governmental standards into voluntary standards. While the NTTAA and the OMB Circular A-119 establish Federal agency participation in the standards development process as an important objective, compliance with this

mandate imposes burdens and costs for the agencies that generally are not allocated in their annual budgets.

Considerable funds may be necessary to cover a variety of costs associated with Federal agency participation in standards-related activities, including the following:

- SDO membership dues;
- Travel costs;
- Staff opportunity costs;
- Staff training;
- Reporting costs (to OMB and ICSP);
- Costs for coordinating with other agencies and SDOs;
- Seed money (i.e., grants) for initiating standards of interest; and
- Infrastructure costs (e.g., information systems, management, and program operation).

In addition, an agency can require significant personnel and financial resources to develop and ensure the continuing adequacy of infrastructure to support its standards program initiatives. These funds would support essential infrastructure elements, including: information systems, tracking participation and use, and performing updates. The experiences of DOE, DoD, and FDA/CDRH, three agencies that have extensively integrated standards activities into their agency culture, underscore the importance of a commitment by top management to providing necessary resources for this activity.

In reality, SDOs and several agencies themselves indicated Federal participants provide little direct financial support to SDOs. Special arrangements can be granted to Federal agencies by SDOs to minimize the costs for participating in SDOs. These gestures reflect a strong desire on the part of SDOs to encourage Federal participation as a partner in standards development activities. For example:

- SDOs often invite Federal agencies to participate in standards development activities by granting full membership rights (i.e., expertise and balloting) even though an agency is not a dues-paying member; and
- A number of SDOs have offered to cover the cost of travel for agency staff interested in participating in a standards development activity. An agency's policy, however, may prevent them from taking such funds.

Ultimately, the industry participants to SDOs bear the burden for costs to research and develop the standards. Although Federal agencies may provide seed money to catalyze a standards development process, this practice is infrequent.

There are significant advantages to greater Federal agency funding of SDO standards development or standards conversion. The following is a non-exhaustive list:

- Given that SDOs are developed by experts assembled from across industries, an agency that financially "supports" standards development by providing one or some of its own staff gains, in return, an entire workforce of experts at basically no additional cost.
- SDOs provide a forum for coordinating with other government and industry stakeholders, which can facilitate and enhance Federal activities to comply with NTTAA and OMB Circular A-119 requirements. Many SDOs also have harnessed the benefits of new technologies (e.g., ASTM has initiated standards development on-line) to provide better communication among participants.
- A number of agencies, especially DoD, are providing funds to SDOs to convert their government standards into voluntary standards. This provides multiple benefits to Federal agencies, including assistance in meeting agency objectives for the use of voluntary standards, as well as placing responsibility for distribution and updating with the SDO.

Finally, it is interesting to note that SDOs have demonstrated a willingness to assist and coordinate with agencies in this regard. For example:

- Principle SDOs to DoD voluntarily notify and send copies of revisions to adopted standards to the agency to expedite tracking by and updates to DoD's Single Stock Point, a clearing house for DoD standards information (DoDISS); and
- Both ANSI and individual SDOs are willing to consult with agencies concerning training issues (e.g., the "equal partnership" concept).

Considerations:

- A commitment by top management to estimate and provide personnel and financial resources to develop sufficient infrastructure to support the agency's standards initiative can support the continuing success of the program.
- An investment in infrastructure (task forces, training, guidance, databases, etc.) to facilitate strong coordination throughout an agency, in turn, can ensure that the funds are used cost-effectively (e.g., minimizes duplication of efforts).
- Agencies may consider providing targeted funds to their principle SDOs to support their standards development requirements under statutory and other programs. ...

IV. ESSENTIAL PROGRAM ELEMENTS

Essential elements for a successful agency voluntary standards program were determined based on the findings delineated in Section III above. Themes dominating the findings section underscore the need for a well-planned and well-structured agency voluntary standards program. In addition, diminishing agency resources accentuate the near-term requirement for a cost-effective and efficient standards program. This section identifies and organizes the essential program elements into a guide for the development of new or the assessment of existing voluntary standards programs.

1. Establish Agency Standards Policy

An agency should develop a clear and concise voluntary standards policy. The policy should serve as the foundation supporting the development and subsequent implementation of specific program components. Fundamental to building a solid foundation, the policy should:

- Outline the specific goals and objectives of the program;
- Cite legal requirements with which the program must comply;
- Designate a Standards Executive position, to coordinate the development of specific program policies and implementing procedures and to foster awareness of standards policies; and
- Establish agency-wide commitment to and pledge resources to develop, support, and implement the program.

2. Establish Organization

The Standards Executive should be responsible for overall program design and implementation. In this capacity, the Standards Executive should establish the internal organizational structure that will govern program development and implementation. In coordination with affected agency programs, the Standards Executive should:

- Define the roles of agency staff and assign responsibilities and accountabilities accordingly;
- Establish a time frame and resource requirements for program development and implementation;
- Publish a plan for implementing the goals and objectives outlined in the agency's standards policy, and milestones for attainment;
- Establish or reaffirm coordination mechanisms within the agency and among other Federal agencies and SDOs as a means to achieve those objectives.

A structure also could be established where the Senior Standards Executive reports to an executive committee with responsibility for ensuring commitment and conducting oversight of the program.

3. Allocate Resources

In principle, the agency should commit in their policy (see above) to provide the necessary resources to support the voluntary standards program. In practice, increased budgetary constraints pose challenges to obtaining sufficient resources for agency standards activities. Nevertheless, to achieve the goals and objectives set forth in the agency policy and satisfy legal requirements, sufficient resources — both in the form of funding and personnel — should be earmarked for the voluntary standards program. Resources should be strategically allocated to cover:

- Staff with technical expertise to participate in standards developing bodies;
- Costs incurred for participation in standards development activities, (e.g., membership dues, travel costs, standards purchasing fees);
- Costs for providing access to voluntary standards information and systems; and
- Costs for developing and operating systems for tracking standards usage and personnel participation in standards development activities.

4. Develop Infrastructure

Developing an effective program infrastructure is fundamental to successful program implementation. Infrastructure components should be consistent with and advance the elements of the agency's voluntary standards policy, and can include the following elements:

- Provide employees with access to existing and in-development voluntary standards;
- Develop guidance with regard to procurement and regulatory involvement and participation;
- Create procedures and guidance materials governing eligibility and institutional capacity for participation in SDOs;
- Publish guidance defining roles and expectations of agency personnel involved in standards development activities;
- Provide staff with training on SDO participation;
- Develop procedures and guidance materials governing the processes for adopting voluntary standards (in whole or in part), tracking adopted standards, and updating adopted standards in procurement and regulatory activities; and
- Create information management systems to support intra-agency standards coordination as well as coordination with other Federal agencies and SDOs.

5. Implement Agency Voluntary Standards Program

Once the program fundamentals are in place, the agency will be able to conduct its standards operations most effectively, including participation in SDO activities,

incorporation and update of voluntary standards into procurement requirements, agency guidance, and regulation. Important elements of such implementation can include:

- Effective intra-agency organization and coordination;
- Support of technology to disseminate information and to network key stakeholders inside and outside the organization; and
- Careful, ongoing review of regulatory requirements for standards adoption.

6. Create Reports

Provisions in NTTAA and/or OMB Circular A-119 require a Federal agency to:

- Maintain a directory of employees participating in voluntary standards bodies;
- Annually report the number of employees participating in at least one voluntary standard body;
- Annually report the number of voluntary standards adopted; and
- Annually summarize and report explanations for not adopting existing voluntary consensus standards (beginning in FY 1997).

An effective voluntary standards program should use available information technologies to track and manage information (e.g., to track participation in the development and adoption of voluntary standards). Using such technologies will reduce administrative paperwork, while facilitating updates and access. This will result in more accurate reporting in accordance with legal requirements. Furthermore, if the proposed revisions to OMB Circular A-119 are adopted, such technologies will ease the exception reporting burden.

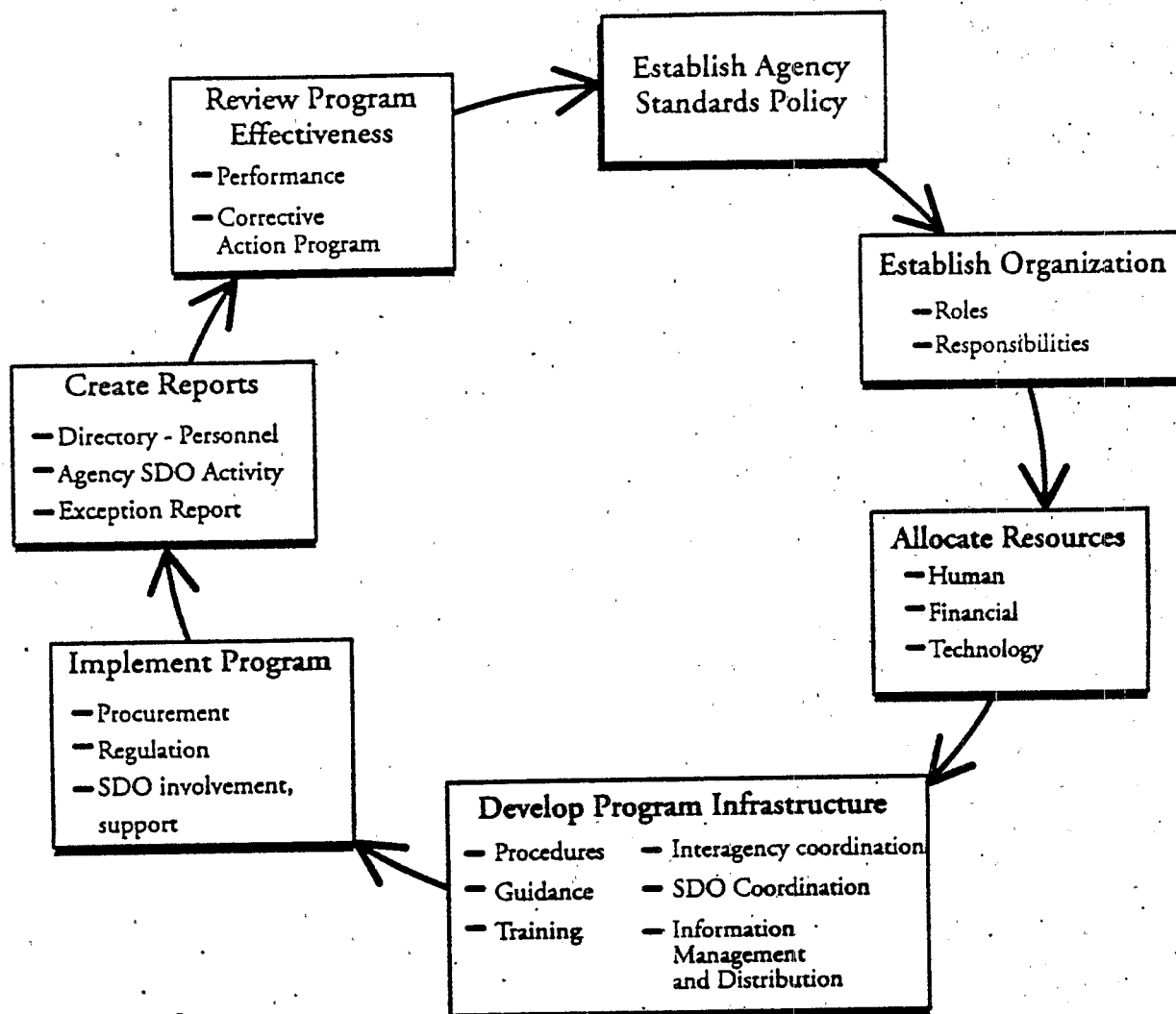
7. Review Program Effectiveness

Compliance with provisions in NTTAA and OMB Circular A-119 will result in increased Federal agency reliance on voluntary standards. In assessing program effectiveness, the agency should develop measures of program success as to whether:

- The voluntary standards program meets the objectives established by agency policy in a timely manner;
- Resources are being allocated efficiently to accomplish objectives; and
- The regulated community is in compliance with adopted voluntary standards.

Appropriate review and corrective action should be taken when necessary to improve whatever program elements require adjustment. This regular review process should involve the senior management team established at the beginning of program development.

Essential Elements for Management of a Federal Agency Voluntary Standards Program



Appendix 1: Agencies/Organizations Consulted

Agency/Organization	Contact	Date of Consultation
NIST	Mary Saunders, Belinda Collins, Pat Cooke, Joanne Overman	May 22, 1997
DoD	Steve Lowell	May 27, 1997
DOE	Dick Black Richard Surbu	May 28, 1997
GSA	Tom Bacon	May 28, 1997
NASA	Dick Weinstein	May 29, 1997
NSF International	Andrea Jensen	May 30, 1997
NRC	John Craig Gil Millman	May 30, 1997
ASTM	Kitty Kono	June 2, 1997
OSHA	Pat Catpafesta	June 2, 1997
CPSC	Collin Church	June 3, 1997
DOT/ITS	Michael Schagrin	June 9, 1997
FDA	Linda Horton Mel Altman (CDRH)	July 2, 1997

Appendix 2: Consultation Talking Points

- Does the agency have a policy concerning use/ development of consensus standards (given A-119)?
- What are the agency's current areas of interest/levels of involvement concerning consensus standards?
 - Does the agency participate/support financially standardization activities through ANSI, including ISO (in what capacity, at what level, ISO 14000 series)?
 - Does the agency participate/support financially standardization activities through SDOs (in what capacity, at what level, which SDOs primarily)?
 - Does the agency participate actively in national/international standards development through other venues (in what capacity, at what level)?
- Describe the agency's experience concerning use/development of standards (examples of effective/ineffective mechanisms).
- What EHS-related standards have been adopted by the agency?
 - Does the agency track standards adopted in regulations it originates?
 - How do agency regulations using consensus standards incorporate subsequent updates to the standards?
- Contrast key differences in burdens and costs to the agency through adoption of consensus standards vs. agency-specific rulemakings?
- How does the agency coordinate with other agencies on standardization activities?
- Are there resources the agency can refer us to (e.g., WWW, documents, persons)?

Appendix 3: List of Acronyms

AAAI	American Academy of Allergy and Immunology
AABB	American Association of Blood Banks
AACC	American Association for Clinical Chemistry
AAMI	American Association for the Advancement of Medical Instrumentation
AASHTO	American Association of State Highway and Transportation Officials
ADA	American Dental Association
AHA	American Heart Association
AIAA	Aerospace Industries Association of America
AIUM	American Institute of Ultrasound in Medicine
ANS	American Nuclear Society
ANSI	American National Standards Institute
APA	Administrative Procedures Act
API	American Petroleum Institute
Archives	National Archives and Records Administration
ASCE	American Society of Chemical Engineers
ASHRAE	American Society of Heating Refrigeration & air conditioning
ASME	American Society of Mechanical Engineers
ASQC	American Society of Quality Control
ASSE	American Society of Safety Engineers
ASSIST	Acquisition Streamlining and Standardization Information System
ASTM	American Society of Testing and Materials
AWS	American Welding Society
CDRH	Center for Devices and Radiological Health
CGA	Compressed Gas Association
CMA	Chemical Manufacturers
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DOJ	Department of Justice
DOL	Department of Labor
DOT	Department of Transportation
DSP	Defense Standardization Program
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FDA	Food and Drug Administration
FPD	Federal Product Description
GSA	General Services Administration
GPO	Government Printing Office
HHS	Department of Health and Human Services
HIMA	Health Industry Manufacturers Association
HPS	Health Physics Society
HUD	Department of Housing and Urban Development
ICSH	International Council for Standardization in Hematology

Appendix 3: List of Acronyms (continued)

ICSP	Interagency Committee on Standards Policy
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IESNA	Illuminating Engineering Society of North America
IHS	Information Handling Services
ISO	International Organization for Standards
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Commission
NCCLS	National Committee for Clinical Laboratory Standards
NCRPM	National Council on Radiation Protection and Measurements
NCSCI	National Center for Standards and Certification Information
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NGS	Non-governmental Standard
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
NSC	National Safety Council
NSF	National Science Foundation
NSSN	National Standards System Network
NTTAA	National Technology Transfer and Advancement Act of 1995
OMA	The Optical Industry Association
OMB	Office of Management and Budget
OSHA	Occupational Safety & Health Administration
PL	Public Law
RESNA	Association for the Advancement of Rehabilitation Technology
SAE	Society of Automotive Engineers
SDO	Standard Developing Organization
State	Department of State
Treasury	Department of Treasury
UL	Underwriters Laboratories
USC	United States Code
USDA	Department of Agriculture
VA	Department of Veteran Affairs

U.S. DOT Intelligent Transportation System (ITS) Program

The US DOT's Joint Program Office is supporting an extensive, multi-year program of accelerated standards development to facilitate the successful deployment of a national Intelligent Transportation System (ITS). ITS Program goals with respect to standards development are driven by the following direction provided by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA): "The Secretary shall develop and implement standards and protocols to promote widespread use and evaluation of ITS technology...To the extent practicable, such standards and protocols shall promote compatibility among ITS technologies implemented through the States...The Secretary may use the services of such existing standards-setting organizations...as appropriate." The standards chosen for the Program include interface standards (e.g., message sets and data dictionaries) and foundation standards (e.g., location referencing and some safety standards) needed to deploy key ITI functions safely and efficiently, as well as other communication standards developed specific to ITI applications. The Program has established guidelines for developing, setting, communicating, and mapping standards within the ITS National Architecture. The Director of the Joint Program Office stated that the successful experience of the ITS standards program corroborates the model presented in this paper.

