

Robert S. Dickman

Robert S. Dickman is the Executive Director of the American Institute of Aeronautics and Astronautics (AIAA), a professional membership technical society with more than 35 000 members in 79 countries. He is the third Executive Director since AIAA's formation in 1963.

Mr. Dickman was born in Brooklyn, New York, grew up in New Jersey and entered the Air Force in 1966 from the Reserve Officer Training Corps (ROTC) programme at Union College, Schenectady, New York. His career spans the space business from basic research in particle physics to command of the 45 Space Wing and Director of the Eastern Range at Cape Canaveral, Florida. He served as the Department of Defense Space Architect and the senior military officer at the National Reconnaissance Office. He retired from active duty in 2000 as a major general. From 2002 to 2005, he was Deputy for Military Space in the Office of the Undersecretary of the Air Force.

Mr. Dickman has graduate degrees in Space Physics and Management and is a distinguished graduate of the Air Command and Staff College and the Naval War College. He has received the Defense and Air Force Distinguished Service Medals, the Air Force Exceptional Civilian Service award, the National Reconnaissance Office Gold Medal, was the National Space Club's Astronautics Engineer of the Year and selected as one of Space News "100 Who Made a Difference."



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ISO Focus: How has the mission of the American Institute of Aeronautics and Astronautics (AIAA), with nearly 75 years of history, evolved to meet the needs of today's global aerospace industry? What set of goals would you like to accomplish in your term as Executive Director of AIAA?

Robert S. Dickman: AIAA has a well deserved reputation for being the focal point for aerospace technology topics, issues and practices. Our 35 000-plus members in 65 regional sections and 79 countries are drawn from all levels of industry, academia, private research organizations, and government. It is a compelling fact: every major achievement in aerospace history can be linked to an AIAA member.

As the industry shifts from a focus on “higher, faster, farther” to creating greater value in a wide variety of sectors, AIAA is relating to a more diverse community of professionals. However, our core role, as codified in our new mission

statement, is still to advance the state of aerospace science, engineering, and technological leadership. We are by no means abandoning our core technical strengths. Rather, we are broadening our scope to include today's professionals in emerging fields.

Our 20-plus conferences per year range from fundamental aerospace science to systems of systems applications and public policy forums. Our publications are changing. We've launched our first all-electronic journal, called *Journal of Aerospace Computing, Information and Communication*. We want to create awareness of the value of aerospace technology in new applications and markets.

My goals are pretty straightforward, although it will take the best efforts of our volunteer members and our staff to achieve them. And, obviously, they are aligned to achieve the broader goals established by our Board of Directors.

First, we must remain the vehicle of choice for aerospace and related professionals to exchange information, largely through our conferences, sympos-



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sia, standards committees, books, journals, our magazine and our public policy initiatives.

Second, we must provide the resources for aerospace professionals and the profession to grow – those in the profession now, and those youngsters that we help attract to the profession.

Third, we must be an articulate, credible, accessible voice of the profession, speaking out on issues that matter to our members and society.



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Finally, I believe we need to grow – in members, in international scope, in diversity and in skill sets. We can't continue to lead unless our membership mirrors the changes we're seeing in this evolving profession.

ISO Focus: Besides operating extensive standard setting activities for space applications in its own right, why does AIAA participate in the ISO standards-making process? Can you please comment on the benefits of participation in ISO?

lished group deals with standardization aimed at reducing space debris generation and mitigating its impacts on the orbital environment.

AIAA recognizes that the aerospace industry in all of its sectors is becoming more international in scope. Technology is being exchanged in many ways as this process moves along. Standardization is one of the leading methods for recognizing shared technology among business partners. It is also one of the safest means for accomplishing a goal that industrial partners and govern-



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Robert S. Dickman : In 1992, following a great deal of outreach and planning, ten space-faring nations around the world agreed to form an ISO committee dedicated to space systems and operations, ISO/TC 20/SC 14. These nations further recommended that AIAA manage the committee by serving as the Secretariat on behalf of the American National Standards Institute (ANSI).

For more than thirteen years AIAA has successfully led the effort to set the international space standards agenda. SC 14 currently has a work programme of over 100 projects, with more than seventy space standards already published. An eleventh nation has joined the committee as a participating member. Seven working groups have been established focusing on topics such as design engineering, operations, and programme management. The most recently estab-

ment agencies, both those who support the technology and those who regulate it, wish to reach. ISO provides the most widely recognized mechanism for promulgating standards among nations.

There is a fine balance between competition and cooperation, especially in an industry that does not have large production or a broad customer base. Nevertheless, standardization has a vital role in the fields of safety, communications, test methods, material compatibility, system interfaces, and risk management. The ISO process offers an effective means for participating nations to exchange their respective needs on these topics and come to a result that is mutually beneficial and in which the public can have confidence.

AIAA has found that the combination of an international standards programme blended with a national

programme provides an ideal mechanism for advancing technology in an appropriate manner. The result of this approach has been a clearer path to the development and promulgation of shared methods and requirements.

ISO Focus: *In an Institute whose membership focuses on emerging technologies in aviation, space and defense, what do you see as being the right moment for the development of standards for new technologies? Can standards act as a vehicle for the dissemination of innovation? Are there areas for which standards can help the industry move forward?*

Robert S. Dickman: Identifying the most appropriate moment to standardize around a given topic is highly dependant on the underlying technology. For instance, in the area of space data transfer (ISO/TC 20/SC 13) – which is rooted in fast-moving information technology – it is important to be constantly evolving to meet ever-growing communication demands on our spacecraft. Standardization based on current state-of-the-art information technology could result in obsolescence of the standard even before it can be deployed. With this in mind, SC 13 is in fact developing new space information technology in anticipation of both future international mission requirements and the future state of terrestrial information technology. In such a case, the standard and the mission requirements must evolve in parallel so that they are able to converge at the right time to match their terrestrial counterparts. A good example of this approach is the development of “Space Internet” capabilities. Standards development began in the mid-1990s and is expected to converge with missions that are launched in 2010 and beyond. Obviously, this approach requires a carefully conceived and planned long-term technology and standards development strategy to ensure adequate time for new, standardized approaches to be demonstrated and for appropriate infrastructure development.



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In contrast, standards being developed for space systems hardware and operations (SC 14) tend to harmonize that which is already known about technologies that are slower to evolve. Such technologies are usually subjected to extensive periods of flight qualification and are used to the very limit of their ability to support mission requirements. SC 14 standards then, for the most part, focus on improving these existing technologies and methodologies by documenting lessons learned at the international level in their development and implementation. This type of standardization is equally as important to ensure future systems are built on a solid foundation of heritage knowledge that results in higher quality and reliability of the end product. Case in point, NASA's recently unveiled exploration architecture will draw heavily on heritage hardware and techniques to achieve its goal. Current international standards can benefit this development cycle in that they have captured much of the knowledge gained from the earlier programmes while evolving to reflect the current state-of-the-art.

Clearly, the nature of standardization itself has changed. Some standards follow the traditional model of codifying existing, well proven techniques while others stretch the limit of new technology so as to be current and relevant at the time of their deployment.

ISO Focus: *What trends, challenges and issues do you see on the horizon for aerospace standards? What standards would you like to see coming out of ISO to help the industry in its next frontier?*

Robert S. Dickman: All effective international standardization must be led by the parties affected by it. They must be willing to identify the priorities as well as contribute to the technology for such documents to be written and reviewed. I believe that future commercial space will include more internationally cooperative programmes. The standards used in these programmes will not necessarily be developed specifically for the aerospace industry, but their role will be crucial. ISO can serve to bridge the gap between technology sectors that contribute to successful aerospace initiatives and the aerospace industry itself. For instance, current IT standards, such as IP and plug and play interface models will play an increasingly important role in future aerospace endeavours. The most beneficial standards will be those that contribute to cost control and system safety and robustness.

Wherever common practices can be used in place of new technology, the cost of very expensive undertakings can be contained. We have already seen in recent entrepreneur-initiated space programmes the benefit of the use of established technology. Both re-examination and sharing of proven safety practices will assure the public that aerospace programmes can be conducted safely.

While it is difficult and dangerous to attempt to predict the future course of aerospace, it is clear that parts of the industry are moving toward a more network-centric baseline. Such an approach requires standardization in order to ensure interoperability among disparate users. Robust standardization at the network layer provides a level playing field and allows industry to compete at the application layer. Whether the necessary standards are developed at the international level within ISO or other specialty standards development organizations (SDOs) will ultimately be determined by the requirements of the end user. ■