Vision 2050
The Way to What’s Next

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About AIA – Who We Are

Founded in 1919, AIA is the aerospace and defense industry’s primary trade association, representing over 330 members from primes, contractors and suppliers to services and consulting firms.

Our Mission
To advocate for policies and investments that keep our country strong, bolster our capacity to innovate and spur economic growth.

Our Vision
To help our united membership improve the safety of air transportation, make America more secure, fuel exploration, drive innovation and ensure a vibrant industrial base.
About AIA – Our Industry's Impact

We strive to raise awareness for our industry’s impact on our way of life.

Generated $865 billion in economic output in 2017.
• Positive trade balance of $86 billion – largest of any U.S. export sector.

Our workforce is over 2.4 million strong, representing nearly 20% of the entire U.S. manufacturing workforce
• In 2017, our industry paid out $220 billion in wages and benefits.
• Our workforce earns a salary 81% above the national average.

When aerospace succeeds, America succeeds.

Other countries are learning from our playbook. They also have a few advantages:
• Nations like China have control over more levers of their industries
About AIA – What We Do

Industry Advocacy – AIA’s staff and member committees produce policy recommendations, organize government-industry discussions and raise public awareness of industry issues.

SMC – Through AIA’s Supplier Management Council (SMC), companies of all sizes work together to develop solutions to government-industry challenges.

Rocket Contest – The Team America Rocketry Challenge, organized by AIA, is the largest student rocketry challenge in the world, inspiring the next generation of innovators.
Inspiring Future Innovators

Appearing at South by Southwest, partnering with National Geographic’s *Project Mars* competition, and working with Scholastic Publications are just a few of many ways AIA works to inspire with our future workforce,
For the past 100 years, AIA represented the industry as it went from balsa and canvas biplanes, to composite-built transcontinental airliners and interstellar space probes.

Our mission, then and now, is to ensure our nation’s leadership in an industry which made the American Century possible.
About AIA – Looking to the Future

The Way to What’s Next: As our world evolves, our industry is at the forefront of groundbreaking technologies. AIA works to bring attention to the challenges and opportunities of tomorrow.
THE WAY TO WHAT’S NEXT
The Way to Shape the Future

For over 100 years, the aerospace and defense (A&D) industry has moved, connected, secured, explored, and inspired the world.

In the decades to come, our industry will continue to be at the forefront of technological advancements that shape many key facets of modern life.

To mark AIA’s Centennial year, we worked with industry leaders and experts to develop a vision of the A&D industry’s impact on society in 2050.

Vision 2050, a study done in partnership with McKinsey & Co., looks at the challenges and opportunities our industry will face over the next 30 years, and paints a picture of life in 2050.
Vision 2050

By 2050, we can see: drones taking on a wide variety of tasks, widespread Urban Air Mobility, supersonic travel, and space becoming increasingly accessible. This will be underpinned by artificial intelligence (AI) and proactive cybersecurity.

This future is possible, but American leadership is not assured. Industry and government must work together to make this future possible.
A Glimpse at A&D in 2050

• Full integration of drones into our economy; performing agricultural tasks and infrastructure repairs

• Alternatives to traveling on congested roads provided by Urban Air Mobility

• A resurgence of supersonic flight makes business travel faster and more efficient than ever before

• Greater accessibility to space creates new markets and business opportunities
The advancements of the next 30 years will be underpinned by Artificial Intelligence (AI):

• Widespread AI, cloud-based technology, and constantly updated data will make it possible for autonomous aerial vehicles, like drones, air taxis and air ambulances, to navigate the world.

• AI decision-making based on insights from integrated data sources will support military operations, protect our armed forces on the battlefield and ultimately, platform-level autonomy will minimize human involvement in combat.
The Time for Action Is Now

To make this optimistic vision a reality, company leaders and players across the value chain will need to take actions that enable progress.

• Some are relatively straightforward and under A&D leaders’ control.
  • E.g. changing manufacturing processes

• Others will require collaboration among many different stakeholders.
  • E.g. technological and infrastructure improvements

• Extensive government participation and regulatory guidance will also be vital to justifying investment in critical enablers like connectivity and physical infrastructure.
Building the Workforce of Tomorrow

• As the world continues to evolve, the technologies and solutions that we will need to develop will require a wider array of talent.

• A&D companies must work together, and also with government stakeholders, to build the next generation of skilled and diverse aerospace workers.
It’s impossible to perfectly predict the future, but experts have painted a remarkable picture of what our world could look like in 2050.

We believe in this optimistic Vision of 2050, but it will take the efforts of both industry and government to make it a reality.

We hope this report will help inspire actions to strengthen American leadership in aerospace and ensure a better future for all.
Cybersecurity
Critical Security Controls for Effective Capability in Cyber Defense
Cybersecurity

• NIST Special Publication (SP) 800-171, “Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations”
  • Consists of 110 “controls”

• If some of its 110 controls are not satisfied, a company may still be awarded a DOD contract provided it has:
  1. A system security plan and
  2. A plan of action and milestone
AIA Cybersecurity Standard:
NAS 9933: “Critical Security Controls for Effective Capability in Cyber Defense”

There are two primary goals for this standard:

1. To provide industry partners an indication of a company’s cybersecurity profile, as a way to measure a company’s cybersecurity risk.

2. To enable reciprocity across industry and critical infrastructure sectors, so that a company’s level of cybersecurity is universally accepted by all whose work supports national interests.

- Transition from static to dynamic cybersecurity standards
- Widespread adoption of NAS 9933 by industry
- Acceptance by DOD of NAS 9933 as a meaningful measure of compliance
- Designed to apply common and universal elements of cybersecurity and consists of 20 control families published by the Center for Internet Security (CIS)
- This format establishes “Capability Level 3” as a minimum performance level, with Levels 4 and 5 as higher-level objectives.

AIA NAS Standards Store: https://global.ihs.com/home_page_aia.cfm?&rid=AIA
Blockchain – Distributed Ledger Technology

Establishing an A & D Minimum Viable Ecosystem
A&D Use Cases for Distributed Ledger

Distributed Ledger is a decentralized data system that maintains and records data.

- Location & Availability of Parts
- Authenticity of Parts
- “As-Flying” Configuration of Aircraft
- Expected Contract Fulfillment, Verification, & Payment
- Expedited Transfer of Aircraft Ownership
- Certification of Maintenance and Flight Personnel
Aviation & Defense Ecosystem

Non-A & D Community
- Developers
- Implementers
- Researchers
- Consultants / Service Providers
- Blockchain Developers
- Users
- Community

Secondary Industry
- Standards
- Developers
- Implementers
- Researchers
- Consultants / Service Providers
- Blockchain Developers
- Users
- Community

Tertiary Industry

A and D Community
- FAA
- NASA
- DoD

Operator Community
- Airlines A4A
- MRO
- Training
- Services

Regulators
- FAA
- NASA
- DoD

Suppliers
- Company OEM A
- Company OEM B
- Company OEM Nth

Arrows Represent Individual blockchain requirements
Ecosystem Blockchain Adoption
Minimum Viable Ecosystem Vision

Arrows Represent Individual blockchain requirements

Blockchain Business Rules and Requirements

Non-A & D Community

Blockchain Community

Secondary Industry

Tertiary Industry

Standards Developers
Implementers
Researchers
Blockchain Developers
Users Community
A&D Consortium Value

Meeting the 2050 Vision

• Engaging industry members and government/customer partners in leadership positions to align on key standards recommendations
• Recommending specific areas for A&D industry investment in blockchain, government engagement, and international collaboration/global competitiveness
• Promoting A&D Blockchain positions at key industry and government forums
• Collaborating with other industry entities and key standards organizations (e.g. NIST, SAE, OMG, ISO) to formulate a cohesive A&D direction/roadmap based on agreed standards
• Recommending how to structure governance bodies to manage compliance to emerging standards while facilitating the current rapid pace of innovation in blockchain
• Aligning with standards organizations to advance critical A&D industry use cases, while avoiding additional administrative or business process burdens
Model Based Enterprise

- Requirements: Mission, KPPs, Requirements
- Design & Drive: Initial Design, Linked Model
- Early Prototyping: Design, Insight vis IDE
- Product: Integrated Test Vehicle
DoD Customer Digital Engineering (DE) Strategy

DoD Customer wants to utilize DE to drive improved agility, quality, efficiency, and cost in acquisition lifecycle.

Source: DoD DE Strategy Paper, Philomena Zimmerman (OSD SE)
Connected Digital Artifacts:
Help the DOD and industry connect and integrate disparate model types: across various disciplines, domains and classes to form a single source of truth for the system.

Digital Cultural Transformation:
Help the DOD and industry champion and promote a “systems thinking” mindset in realizing the model centric cultural transformation.

Intellectual Property and Data Rights:
Help the DOD and industry collaborate and work together to ensure IP and Data are protected and managed effectively in the new model centric ecosystem.

Trusted Verified and Validated (V&V) Digital Artifacts:
Help the DOD and industry develop a digital artifacts maturity model to formalize the process in which new models are V&V’d and integrated into the technical baseline.
MBSE and DE Vision

- Promote acquisition reform programs that help the evolution of rapid acquisition DE technologies
- Invest in the standardization of data exchange protocols that protect model centric IP throughout the entire lifecycle of the product
Industry Recognized Apprenticeship Program (IRAP)
Industry Recognized Apprenticeship Standards

Industry investment in workforce certificate program to ensure a common understanding and validation of achievement through an Industry Recognized Apprenticeship Program (IRAP)

**NAS9932**, Industry Recognized Apprenticeship Program, Overview

**NAS9932-1**, Industry Recognized Apprenticeship Program, Traditional (Technology-Based or Manufacturing) Apprentice Program

**NAS9932-2**, Industry Recognized Apprenticeship Program, Internship Program

**NAS9932-3**, Industry Recognized Apprenticeship Program, Cooperative Education Program

**NAS9932-4**, Industry Recognized Apprenticeship Program, New College Hire Rotational Program

**NAS9932-5**, Industry Recognized Apprenticeship Program, Management Leadership Training Program

Future efforts:
- Work with broader set of stakeholders (industry, academia, students) to revise standards if needed
- Next higher level of Assessment-based Certification
