
ASME ROBOTICS INITIATIVES

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Five Strategic Technologies

Eight Enabling Applications

Advanced Manufacturing

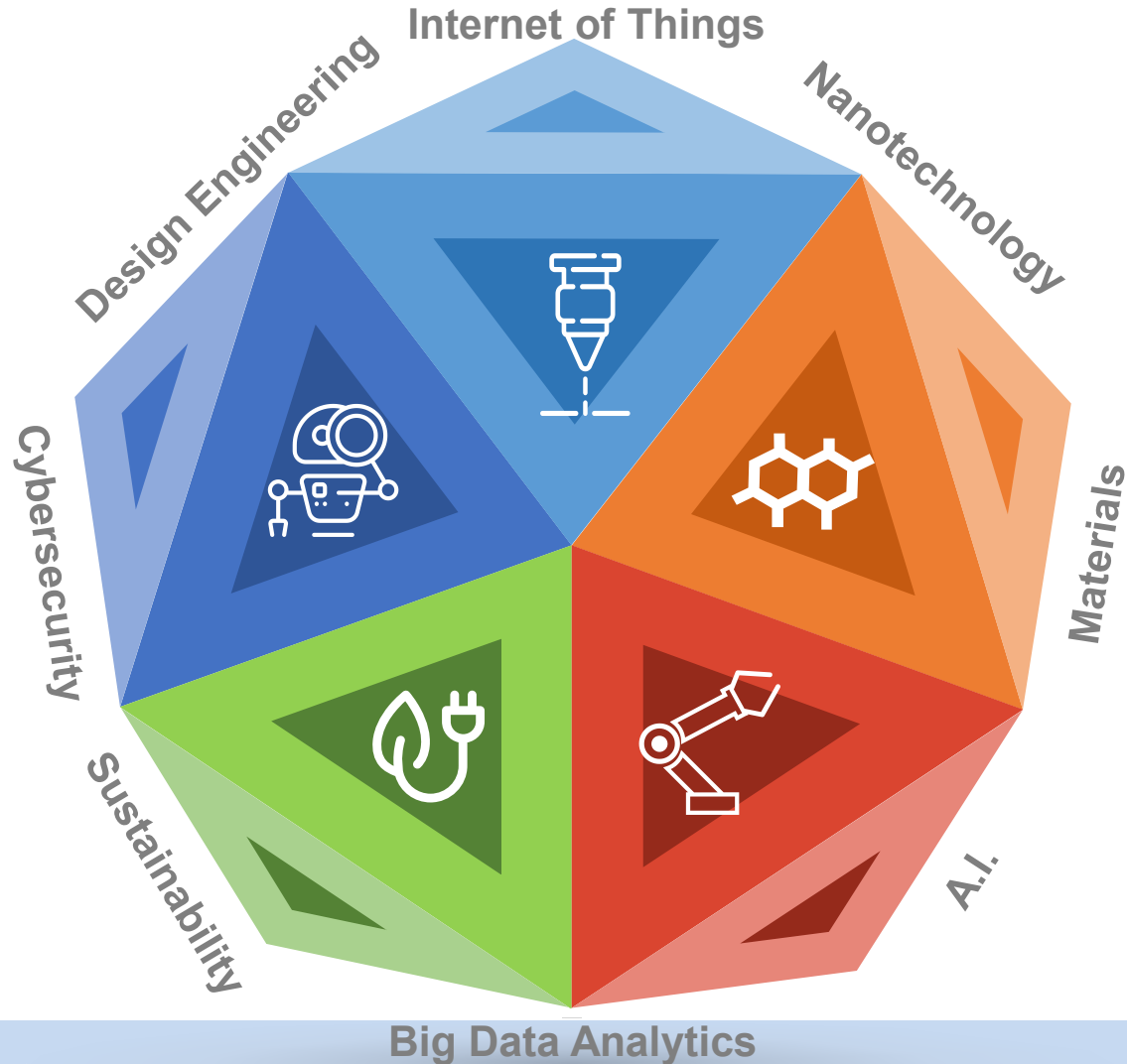
Additive Manufacturing
Industry 4.0

Pressure Technology

Design | Materials | Fab
Inspection | Operation
Commissioning | Maintenance

Clean Energy

Solar | Wind | Biomass
Storage | Nuclear



Bioengineering

Cellular Manufacturing |
Biologics | Tissue Engineering

Robotics

Industrial Automation | UAVs
Field | Mobile | Autonomous

New Standards Committees for Robotics

No.	Name of Committee	Started	Reports to Standards Committee
1	Mobile Unmanned System (MUS) Standards Committee	July 2019	MUS is a new Standards Committee
2	Special Working Group on the Use of Unmanned Aerial Systems (UASs) for Inspection	May 2017	Under the MUS Standards Committee
3	Special Working Group on the Use of Crawler/Ground Robots for Inspection	March 2019	
4	B30.32 Unmanned Aircraft Systems (UAS) used in Inspection, Testing, Maintenance and Material Lifting Operation	June 2017	B30 Standards Committee on Safety Standards for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings
5	B30.31 Self-Propelled, Towed, or Remote-Controlled Hydraulic Platform Transporters	Sept 2017	
6	Subcommittee on Robotic Arms (Manipulators)	July 2019	Manufacturing and Advanced Manufacturing (MAM) Standards Committee

Subcommittee on Robotic Arms (Manipulators)

- **Reporting Committee:** Manufacturing and Advanced Manufacturing (MAM) Standards Committee.
- **Charter:** Develop and maintain Standards for terminology, performance requirements, and related topics for robotic arms (manipulators)
- **Members:** 12 Members, 8 Contributing Members.
- **Meetings/Teleconferences:** Task Group held several teleconferences before forming the Subcommittee. Subcommittee held their first teleconference on November 12, 2019. Currently, holding meetings every two months.

Subcommittee on Robotic Arms (Manipulators)

- The common theme from the Interested Party volunteers that initially met was the need for a Nomenclature Standard. A Task Group on Nomenclature for Performance with the following Scope was formed: identify any gaps in existing Standards as it relates to Robotic Arms Performance Nomenclature.
- A Task Group on Performance Standards with the following Scope was formed: identify any gaps in existing Standards as it relates to Robotic Arms Performance Standards.
- Volunteers repeated their concerns that ASME should not be duplicating existing Standards/Documents that have already been published by other SDOs.
- ASME is committed to not duplicating any existing Standards/Documents. ASME is encouraging as many people as possible to get involved in the new Subcommittee on Robotic Arms (Manipulators).

Subcommittee on Robotic Arms (Manipulators)

- The MAM Subcommittee on Robotic Arms (Manipulators) has decided to concentrate its efforts on a performance Standard.
- Three possible topics were at first proposed: a) Multi-robot performance, b) Physical Requirements and c) Calibration/Registration Error.
- The Calibration/Registration Error topic was selected as it may be a good starting point for the committee as there does not appear that there are any other SDO's looking into this area.
- Jeremy Marvel, Chair developed a proposed Scope for a document that was reviewed and accepted by the committee during their July 14, 2020 meeting.

Subcommittee on Robotic Arms (Manipulators)

- On October 16, 2020; ASME submitted a PINS to ANSI regarding the creation of a new document:
 - Title:** ASME RM-1 Registration and Calibration Performance Test Methodology for Robotic Manipulators
 - SCOPE:** This document provides definitions for test methods for the registration and calibration verifications of industrial robotic manipulators. This document establishes guidelines for assessing the sources and magnitudes of registration and calibration uncertainty. This document also provides a means to quantify the impacts of registration and calibration uncertainty on the performance of the manipulators system, and to provide guidance for reducing uncertainty to levels commensurate to the user's specified task requirements.
- Jeremy Marvel, Chair worked on an outline for the document which was reviewed during a June 01, 2021. Members will be reviewing the outline during the next couple of weeks and volunteered to fill in the different Chapters.
- SharePoint Site has been created where members will be able to collaborate.
- Next meeting is scheduled for July 27, 2021.

Mobile Unmanned Systems (MUS) Standards Committee

- **Charter:** Application of Mobile Unmanned Systems (MUS) for inspections, monitoring, and maintenance of industrial facilities and power plants as well as equipment, transmission lines, and pipelines.
- **Members:** Currently have 6 members;
- **Meetings/Teleconferences:** July 10 & Sep 16, 2019.



SWG on Use of UAS/UAV for Inspections

- **Standards Document:** Developing guidance document to provide “how to” utilize Unmanned Aerial Systems to safely and reliably perform Visual Inspections and obtain quality data
 - Estimate to publication in 2 years or so.
- **Members:** 20 members; Owner/Operators, UAS OEMs, sensor manufacturers, service providers, and research entities. Plus 40 + interested parties.
 - Meets in-person 4 times a year at ASME Boiler Code Week; Monday 5– 7 pm.
 - Hold 1-2 teleconferences in between in-person meetings

SWG on Use of Crawlers/Ground Robotics for Inspection

- **Members:** In the process of forming the membership for the Use of Crawlers/Ground Robotics for Inspection subcommittee.
 - Currently have 13 potential members and 3 interested parties who are interested in participating in the subcommittee
- **Meetings/Teleconferences:** 5 teleconferences - March, April, Jun, Oct and Nov 2019



Other ASME Robotics Activities

B30 Safety Standards Committee for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings

- B30.31, Self-Propelled, Towed, or Remote Controlled Hydraulic Platform Transporters with the following objectives: Standard to be developed will contain provisions that apply to the construction, operation, inspection, testing, maintenance, and safe use of hydraulic platform transporters for handling loads and will not apply to commercial truck transportation of loads over public roadways.
- B30.32 Unmanned Aircraft Systems (UAS) Used in Inspection, Testing, Maintenance, and Lifting Operations. Charter: Inspection, testing, maintenance, and safe use of unmanned aircraft systems used in inspection, testing, maintenance and material lifting.