



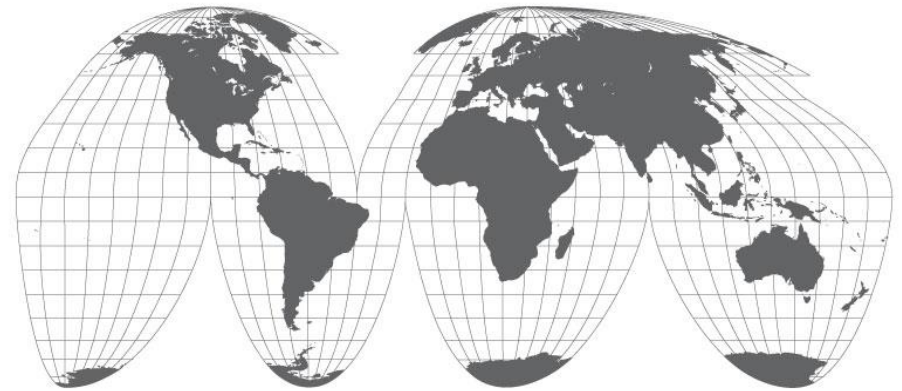
Ian Simpson

Associate Program Manager – Welding  
Performance Review Institute

EASA Workshop on Additive Manufacturing  
28<sup>th</sup> September 2016

## AGENDA

- ▶ Nadcap Overview
- Status of AM to date
- Next Steps
- Future Work



## DEFINITIONS – PRI

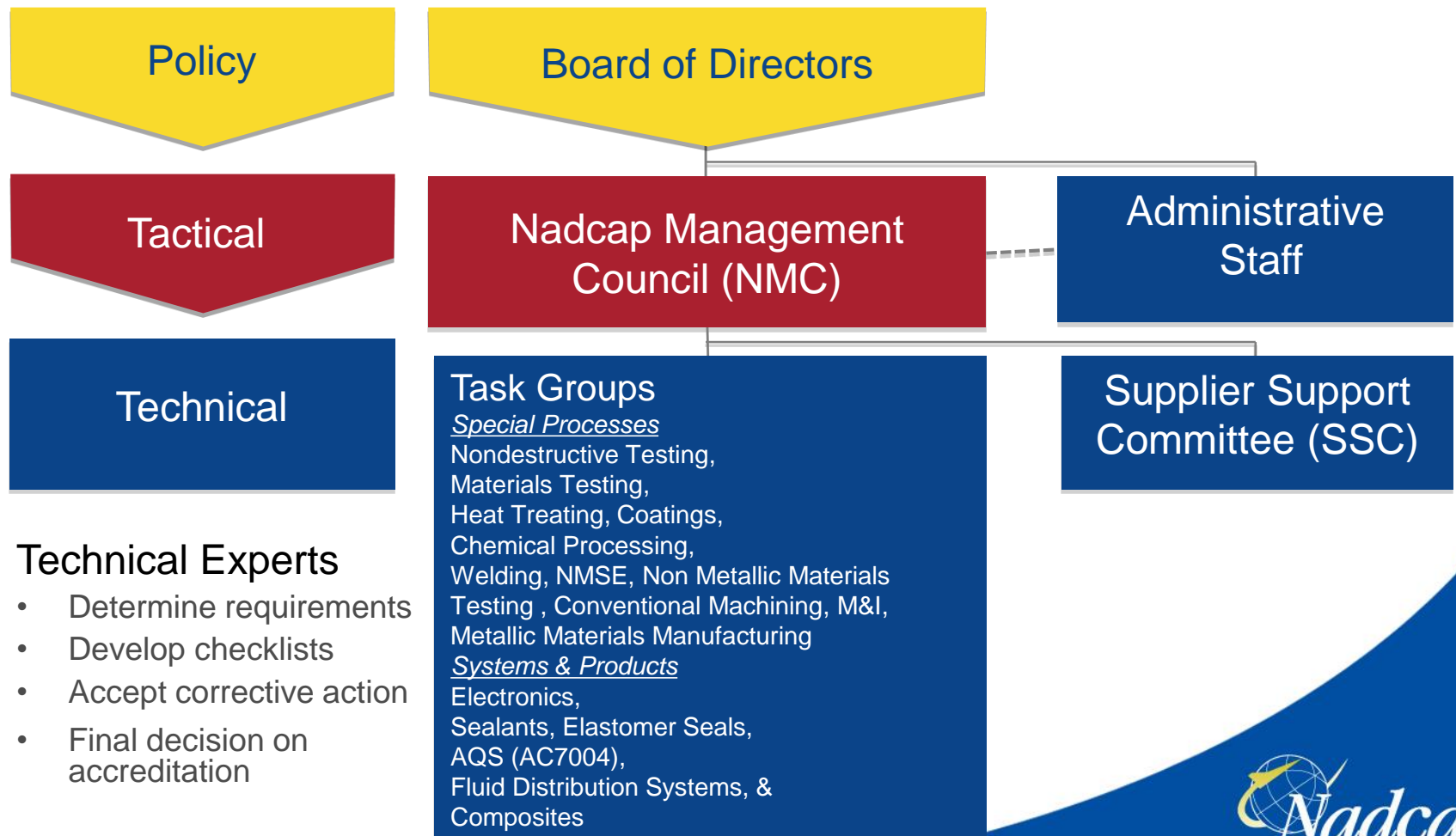
**PRI:** The Performance Review Institute is a **not-for-profit** affiliate of **SAE** whose mission is to: Provide global, unbiased, independent manufacturing **process and product assessments and certification services** to the mobility industry for the purpose of adding value, reducing total cost and facilitating teaming between primes & suppliers. PRI administers Nadcap.

**Nadcap:** The leading worldwide **co-operative program** of major companies designed to manage a **cost effective consensus approach** to special processes and products and provide **continuous improvement** within the aerospace industry.

## Nadcap PROGRAMS

- **Special Processes**
  - Nondestructive Testing (NDT)
  - Materials Testing (MTL)
  - Heat Treating (HT)
  - Coatings (CT)
  - Chemical Processing (CP)
  - Welding (WLD)
  - Nonconventional Machining & Surface Enhancement (NMSE)
  - Non Metallic Materials Manufacturing (NMMM)
  - Non Metallic Materials Testing (NMMT)
  - Conventional Machining as a Special Process (CMSP)
  - Measurement and Inspection (M&I)
  - Metallic Materials Manufacturing (MMM)
- **Systems & Products**
  - Aerospace Quality Systems (AQS): AC7004
  - Fluid Distribution Standards (FLU)
  - Elastomer Seals (SEALS)
  - Sealants (SLT)
  - Composites (COMP)
  - Electronics (ETG)

## PRI/Nadcap ORGANIZATIONAL STRUCTURE



## AUDIT CRITERIA Requirements

- For items to be included in a checklist, there must be a requirement

Either

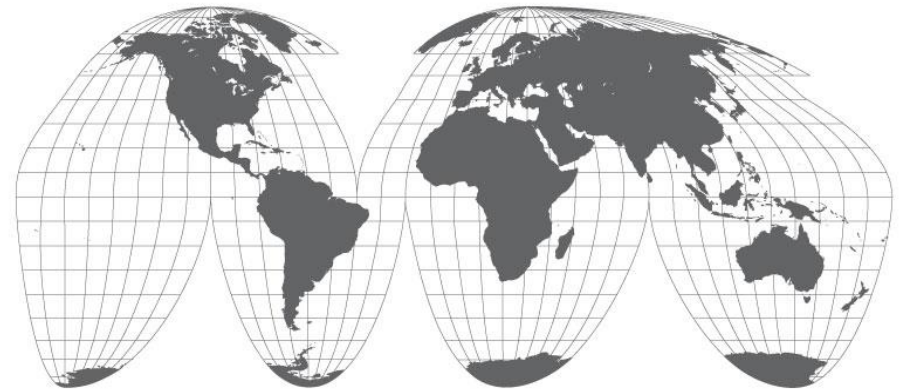
- ▶ Defined in an Industry Standard

Or

- ▶ Common among Subscribers

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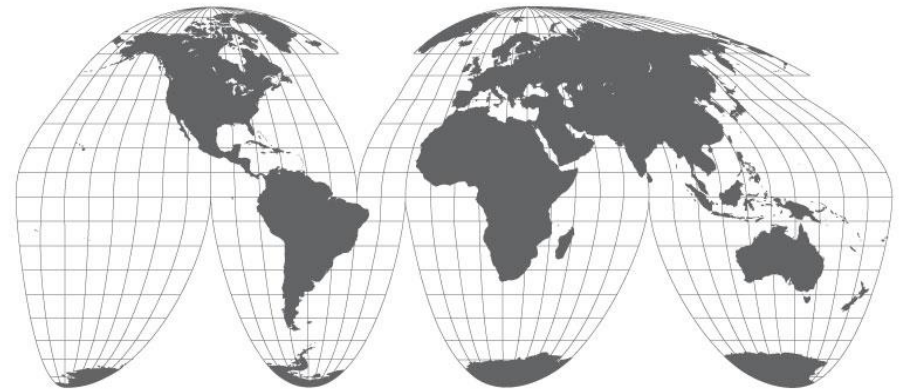
## TIMELINE

- **October 2013** – NMC assigned responsibility for AM to the Welding Task Group and sub-team assigned
- **February 2014** – sub-team presented to Task Group on the various methods of AM and agreed initial focus would be to develop a checklist to assess **Laser and Electron-beam powder bed** variants of the process
- **February 2014 – April 2016** – Checklist development including
  - Trial audits
  - Equipment Manufacturer input
  - Validation that checklist meets Nadcap requirements (Common requirements among Subscribers)
- **April 2016** – Draft checklist sent on technical ballot
- **July 2016** – Technical ballot comments resolved and affirmation ballot
- **August 2016** – Technical ballot approved (minor editorial changes)
- **August 2016** – NMC ballot
- **September 2016** – Checklist approved



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## NEXT STEPS

- Revise procedures to recognize new checklist (AC7110/14). By end September 2016
- Issue checklist (Note: unable to issue until effectivity date established)
  - Once issued anyone who has registered for eAuditNet ([www.eauditnet.com](http://www.eauditnet.com)) will be able to access the checklist (Resources / Documents / Audit Checklists / Welding)
- Provide Theoretical training for existing Weld Auditors who have been identified as suitable by the Task Group. October 24<sup>th</sup> 2016
- Provide Practical training for auditors. By end February 2017
- Auditors approved to audit AM. By end April 2017
- Audits to AC7110/14 can be conducted. From May 2017
  - Parent checklist (AC7110) will be required
  - Audit length 2 days.

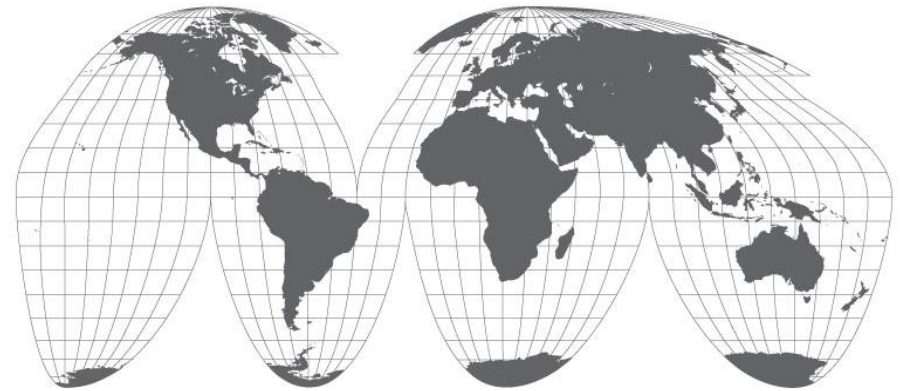
## NEXT STEPS

In addition

- Sub-team are developing a Handbook to support the checklist. This will provide information on the intent of the checklist questions and define what information can be presented as Objective Evidence for each question. By end December 2016. This will be posted in eAuditNet (Resources Documents / Public Documents / Welding / Handbooks and Guides)
- An exam is being created which auditors will need to pass before they are approved to audit this process
- Each Auditor will be interviewed by the Task Group prior to being approved to audit this process

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## FUTURE WORK

- Checklist revision based on revisions to Subscriber specifications and Industry specifications becoming available
- Source additional Auditor capacity (dependent on number of anticipated audits)
- Identify need for additional checklists to cover other AM sub-processes, and develop checklists as necessary

## NEXT Nadcap MEETING

**24-26 October 2016**

**Pittsburgh, PA, USA**

***On-line registration and agendas available at  
[www.p-r-i.org](http://www.p-r-i.org)***

Anyone can attend Open meeting sessions. Open meetings on 25 & 26<sup>th</sup> October.  
Afternoon session of 25<sup>th</sup> October is dedicated to Additive Manufacturing.

## Nadcap Weld Contacts for Additive Manufacturing

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## QUESTIONS

**QUESTION TIME**

