The main features of this agenda are:
- Newcomers Welcome on Monday morning.
- Working sessions on Monday, time slots to be defined.
- SAE Aerospace Standards Reception on Monday evening and AeroTech Evening Reception on Tuesday.
- Meeting with AE-7 on Tuesday morning and with the Electric Aircraft Steering Group on Thursday morning.
- Tour of NASA JPL on Tuesday afternoon.
- AeroTech Symposium on Wednesday.
- Panel and A-6 committee meetings from Thursday morning to Friday noon with a tight and unusual schedule.
- Short courses on Monday: “Introduction to Aircraft Hydraulic System Design and Certification” and “Flight Control Actuation System, Considerations on Architecture Design and System Installation”

A $100 discount applies for short course registration prior to Feb 17, 2020.

To members who are unable to attend
Voting members who are unable to attend a meeting in person may appoint an alternate in their place if:
- The absent Committee and/or Panel member has notified in writing (email) to the relevant Committee and/or Panel Chairman in advance of the meeting, providing all contact information for the alternate.
- The absent member has pre-briefed the alternate on all topics, documents, and actions planned to be covered during the meeting so that the alternate is prepared to act in the absent member’s stead.
- The alternate is only representing the Committee/Panel member who made the appointment (i.e., a Committee/Panel member may not ask another Committee/Panel member to represent both himself and the member unable to attend, which means no person can have more than one vote, or in other terms, a Panel member cannot be represented by another member of the same Panel).
- A liaison member can be designated as an alternate for a specific meeting when a member is unable to attend or send another person from the organization.

Alternates are counted towards committee/panel quorums and allowed to vote in the original member’s place.
# Table of contents

Agenda overview .................................................................................................................. Page 3
Steering Council .................................................................................................................. Page 4
Welcome and introduction to committee A-6 ........................................................................ Page 6
Newcomer Welcome ............................................................................................................. Page 6
Family Meet and Greet ......................................................................................................... Page 6
A-6 Meets AE-7 ..................................................................................................................... Page 7
A-6 Meets EASG ................................................................................................................... Page 7
Tour ........................................................................................................................................ Page 7
Receptions ............................................................................................................................ Page 6
Symposium .......................................................................................................................... Page 8

**Breakout sessions**

Appendix 1: Breakout session organization reminder .............................................................. Page 35

A-6A1 Commercial Aircraft .................................................................................................. Page 9
A-6A2 Military Aircraft .......................................................................................................... Page 9
A-6A3 Flight Control and Vehicle Management Systems ....................................................... Page 9
A-6B1 Hydraulic Servo Actuation .......................................................................................... Page 10
A-6B2 EHA ........................................................................................................................... Page 10
A-6B3 Electromechanical Actuation ....................................................................................... Page 11
A-6C1 Contamination/Filtration ............................................................................................. Page 11
A-6C2 Seals ............................................................................................................................ Page 11
A-6C3 Fluids .......................................................................................................................... Page 11
A-6C4 Power Sources ........................................................................................................... Page 12
A-6C5 Components .............................................................................................................. Page 12

**Panel meetings**

A-6A1 Commercial Aircraft .................................................................................................. Page 13
A-6A2 Military Aircraft .......................................................................................................... Page 15
A-6A3 Flight Control and Vehicle Management Systems ....................................................... Page 17
A-6B1 Hydraulic Servo Actuation .......................................................................................... Page 19
A-6B2 EHA ............................................................................................................................ Page 21
A-6B3 Electromechanical Actuation ....................................................................................... Page 23
A-6C1 Contamination/Filtration ............................................................................................. Page 25
A-6C2 Seals ............................................................................................................................ Page 27
A-6C3 Fluids .......................................................................................................................... Page 29
A-6C4 Power Sources ........................................................................................................... Page 30
A-6C5 Components .............................................................................................................. Page 32

A-6 Meeting .......................................................................................................................... Page 34

Appendix 2: Short courses .................................................................................................... Page 37

Appendix 3: Statements ........................................................................................................... Page 41

Appendix 4: Room assignments ............................................................................................ Page 42
## Agenda Overview

### COMMITTEE/ PANEL SUBCOMMITTEE

<table>
<thead>
<tr>
<th>COMMITTEE/PANEL</th>
<th>SU 15</th>
<th>MON 16</th>
<th>TUES 17</th>
<th>WED 18</th>
<th>THRS 19</th>
<th>FRI 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering Council</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Welcome</td>
<td>6-7</td>
<td>8-9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Newcomers welcome</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Family dinner and great</td>
<td>6-7</td>
<td>8-9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>SAE Standards Reception, AeroTech Evening Reception, AeroTech Luncheon</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>A-6 meets AE-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-6 meets AEG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISS, NASA, Jet Lab, Laboratory tour</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>AeroTech Symposium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-6 Committee meeting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### A-6: SYSTEM/EQUIPMENT INTEGRATION

<table>
<thead>
<tr>
<th></th>
<th>SU 15</th>
<th>MON 16</th>
<th>TUES 17</th>
<th>WED 18</th>
<th>THRS 19</th>
<th>FRI 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 - Commercial Aircraft</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>A2 - Military Aircraft</td>
<td>6-7</td>
<td>8-9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>A3 - Flight Control and Vehicle Management Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### A-68: ACTUATION & CONTROL

<table>
<thead>
<tr>
<th></th>
<th>SU 15</th>
<th>MON 16</th>
<th>TUES 17</th>
<th>WED 18</th>
<th>THRS 19</th>
<th>FRI 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 - Hydraulic Servo Actuation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>B2 - EHA (2:50-4:10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3 - Mechanical and electromechanical actuation systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### A-6C: POWER GENERATION & DISTRIBUTION

<table>
<thead>
<tr>
<th></th>
<th>SU 15</th>
<th>MON 16</th>
<th>TUES 17</th>
<th>WED 18</th>
<th>THRS 19</th>
<th>FRI 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 - Contamination/Filtration</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>C2 - Seals (1:10-5:30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3 - Fluids</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C4 - Power Sources (1:30-2:50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C5 - Components (2:30-4:15)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SHORT COURSES (2)

<table>
<thead>
<tr>
<th></th>
<th>SU 15</th>
<th>MON 16</th>
<th>TUES 17</th>
<th>WED 18</th>
<th>THRS 19</th>
<th>FRI 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic Systems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Flight Control Actuation System Architectures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NOTES

- L: 12:00 PM - 1:30 PM
- R: Reception 6:00 - 8:00 PM
- NH: Newcomer Welcome 8:30 - 9:30 AM
- T: Tour leaving the hotel at 3:00 PM
- Times: 1 - 4 One hour blocks 8:00 - 12:00 AM with 15 minute breaks every 2 hours
- Times: 5 - 8 One hour blocks 1:30 - 5:30 PM with 15 minute breaks every 2 hours
- (1) Attendance by invitation
- (2) Requires specific registration
- Symposium & Tour
- Break out sessions and workshops (to be adjusted)
- Panel & A-6 meetings
- Short courses
- Steering Council

### FOR INFORMATION

- AMS-CR Elastomer workshop
- AMS-CR Elastomer meeting
- AMS-P Polymer meeting
S1. Introduction, Attendance, Meeting 167 minutes approval

S1.1 Introduction – Chairman Halley
S1.2 Roll Call – Secretary Dickey
S1.3 Meeting 167 Minutes Approval - Secretary Dickey
S1.4 Review of Actions - Secretary Dickey

S2. Overall A-6 and Panel Meeting Agenda

S2.1 Any issues/improvements for future meetings – Vice-Chairman van den Bossche

S3. Operational and Organization Issues

S3.1 Leadership
S3.2 Committee A-6 Structure, Appointees, and Membership
S3.2.1 A-6 Structure
S3.2.1.1 Any changes suggested to A-6 structure – All
S3.2.2 Appointees
S3.2.2.1 Any new appointees required – All
S3.2.3 Membership
S3.2.3.1 Confirmation of members proposed from Meeting 167 - Chairman Halley
S3.2.3.2 Identification of potential new members – All

S4. Strategic Issues

S4.1 How A-6 adapts to and positions itself relative to new technologies - Chairman Halley

S5. Symposium

S5.1 Fall 2020 Symposium – Professor Maré
S5.2 Future Symposia - All

S6. Review and Action on Current Issues

S6.1 Inconsistent Requirements across Specs – Chairman Halley
S6.2 Joint Projects with Other SAE TCs – All
S6.2.1 Follow up with joint activities with A-5 - All

S7. A-6 Charters

S7.1 Review of A-6 and Panel Charters – Chairman Halley/Dr. Zielinski

(Continued on next page)
S8. Short courses

S8.1 Proposals for future meeting short courses – Vice-Chairman van den Bossche

S9. A-6 Documents

S9.1 Any Proposals for New Documents of General Interest – All
S9.2 A-6 Document Status
S9.2.1 AS1290 – “Graphic Symbols for Aircraft Hydraulic and Pneumatic Systems” – Mr. Keenan
S9.2.2 AIR737 “Aerospace Hydraulic and Pneumatic Specifications, Standards, Recommended Practices, and Information Reports” – Chairman Halley/Mr. Covington
S9.2.3 ARP1383 – “Aerospace - Impulse Testing of Hydraulic Components” – Mr. Reider
S9.3 A-6/A-5 Document List – Secretary Dickey

S10. Document Quality – Mr. Keenan

S11. SC Technical Topics – All

S12 Communication – Secretary Dickey

S13. Performance Recognition – Mr. Schofield

S14. SAE Staff Report – Ms. Lloyd

S15. Treasurer's Report

S16. ISO Liaison - Dr. Zielinski

S17. Policies & Procedures - Dr. Zielinski

S17.1 P & P revision further to discussions related to the Butyl O-ring Part Standard new project approval.

S18. Subcommittee Reports

S18.1 A-6A System/Subsystem Integration - Mr. Covington
S18.2 A-6B Actuation and Control - Mr. Besliu
S18.3 A-6C Power Generation and Control - Dr. Zielinski

S19. Future Meetings

S19.1 Fall 2020: Niagara Falls, Canada - Ms Lloyd
S19.2 2021 Meetings - All

S20. Other Business

Please contact Chairman Halley to request additions to this agenda.

S21. Meeting Adjournment
Welcome and Introduction to Committee A-6
Monday March 16
8:00 AM - 8:30 AM
Chairman Ian Halley

- A special event: meeting in conjunction with SAE AeroTech Americas 2020: Meeting extended to Friday morning with a tight and unusual panel and A-6 meeting schedule.
- Role and Mission of A-6
- Committee A-6 Structure and Leadership:
  - Organization and responsibilities of the Subcommittees and Panels.
- Summary of Meeting Agenda and Logistics
- Breakout sessions: objective is to take benefit of the full day for working together
- Symposium, organized by AeroTech this time, one A-6 presentation
- Focus on Lessons Learned
- Short courses: an opportunity to fulfill learning needs and to bring new comers to A-6
- Social Events
- Upcoming meetings

Newcomer Welcome
and Introduction to Committee A-6 Steering Council
Monday March 16
8:30 AM – 9:30 AM

An opportunity to meet the A-6 steering council and learn more about the A-6 organization and operations:

- SAE Overview
- A-6 Background
- A-6 Organization and Participation
- Steering Council Introductions

Family Meet and Greet
Monday March 16
8:30 AM – 9:30 AM

This is an opportunity for Spouses and Families of attendees to meet each other and plan potential activities during the week.

Receptions

- SAE Standards Reception: Monday March 16, 6:00 PM - 8:00 PM – Lower Level Lobby Pasadena Convention Center
- AeroTech Evening Reception: Tuesday March 17 5:00 PM – 7:00 PM – Exhibit Floor
- Aerotech Luncheons: Tuesday and Wednesday 12:00 PM – 1:30 PM Lunch in the Exhibits
AEROSPACE ACTUATION, CONTROL
AND FLUID POWER SYSTEMS
SAE COMMITTEE A-6

A-6 Meets AE-7
Tuesday March 17
8:00 – 11:00 AM

- High voltage road map - AE-7
- Actuator road map – A-6
- Address designs of component and testing methods for higher voltage applications - AE-7
- Dedicated actuation power networks - Group discussion
- High voltage (540 VDC) and possibly “dirty”, i.e. with relaxed harmonic distortion requirements? – Group discussion
- Actuator Simulation with additional discussion on aligning actuator modeling with AE-7 projects A-6

Open to anyone interested.

Tour
Tuesday March 17
12:30 – 5:30 PM

Visit of the NASA Jet Propulsion Laboratory in Pasadena, open to everyone, maximum participants 80.
Registration : contact dorothy.lloyd@sae.org

Departure : Pasadena Convention Center 12:45 pm, begin loading coaches 12:30 pm.
Tour completion 4:30 pm.

• All US citizens 18 years of age or older visiting JPL MUST present official, government-issued photo identification, such as a driver's license or passport, before being allowed entry.
• Anyone not on our approved roster will not be admitted on to the facility. *Note: Substituting roster names the day of the tour is not allowed*
• All non-US citizens (Foreign Nationals) 18 years of age or older MUST present either a passport or resident visa (green card) before being allowed entry. Individuals without the appropriate identification will NOT be admitted to the facility.
• The tour includes considerable walking and stair climbing. Dress comfortably and appropriately for the weather. Wheelchairs can be accommodated with prior notice. Cameras are allowed on the tour. While a small personal item can be brought on tour, please refrain from bringing any large items, such as duffle bags and suitcases.

A-6 Meets the Electric Aircraft Steering Group
Thursday March 19
11:00 AM-12 PM

- Introduction
- EASG overall view presentation - EASG
- A-6 organization/objectives & A-6 activities linked to More Electrical Aircraft”(ARP/AIR list, dedicated conferences, course, …) - A-6
- A detailed example: ARP 7490 Recommended Guidelines for the Specifications of Motor Control Electronics for Electrically Powered Actuation – Michel Todeschi
- Open discussion
- Conclusion

Open to anyone interested.
SAE A-6 AEROSPACE ACTUATION, CONTROL AND FLUID POWER SYSTEMS

AEROTECH SYMPOSIUM
Wednesday March 18 *
8 AM – 5:30PM

The SAE AeroTech provides a forum for the global aerospace community to meet and discuss current and future challenges, opportunities, and requirements of R&D, products, and systems. Technical sessions, panel discussions, and keynote presentations make up a program that provides value to the entire technical community, including engineers, scientists, designers, managers, and academia. The technical program will cover a broad spectrum of topics including from nose to tail, concept to sustainment. AeroTech also provides a venue for engineers participating on SAE committees and advisory bodies to meet and discuss industry standardization efforts and best practices. The event also provides opportunities for networking and personal discussion with other industry experts through networking breaks, exhibits, awards luncheon, and receptions.

* : Although presentations will be delivered on March 17/18/19, those of interest to A-6 are to be gathered on March 18, as far as possible. More information at https://www.sae.org/attend/aerotech/program
### COMMERCIAL AIRCRAFT ~ PANEL A-6A1
**Time 8:30-9:30 AM**

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>ARP5007</td>
<td>Joint discussion with A-6A2/A3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MILITARY AIRCRAFT ~ PANEL A-6A2
**Time 8:30 AM-3:30 PM**

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>ARP5007</td>
<td>Joint discussion with A-6A1/A3</td>
<td>Marini/Rieder</td>
<td></td>
</tr>
<tr>
<td>9:30</td>
<td>AS5440B</td>
<td>Design and Installation Requirements for Aircraft Hydraulic Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td>A1R5891</td>
<td>Achieving Cleanliness Standards for Aircraft Hydraulic Systems During Manufacture</td>
<td>Collet</td>
<td></td>
</tr>
<tr>
<td>1:30</td>
<td>AS8775</td>
<td>Hydraulic System Components, Aircraft and Missiles, General Specification For</td>
<td>Perry/Borla</td>
<td></td>
</tr>
<tr>
<td>2:30</td>
<td>ARP8447</td>
<td>Methodology for Testing Pump Pulsation in Aircraft and Iron Birds</td>
<td>Lohe</td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FLIGHT CONTROL AND VEHICLE MANAGEMENT SYSTEMS ~ PANEL A-6A3
**Time 8:30 AM-5:30 PM**

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>ARP5007</td>
<td>Development Process - Aerospace Fly-By-Wire Actuation System : Discussion regarding this document versus the process in ARP4754, joint discussion with interested parties from A-6A1 and A2</td>
<td>Nist</td>
<td>Beaton, Huynh, Covington</td>
</tr>
<tr>
<td>9:30</td>
<td>ARP5769</td>
<td>Dielectric Strength and Insulation Resistance Testing of Flight and Utility Control Systems and Components</td>
<td>Zieren</td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td>ARP6001</td>
<td>Aerospace, Passive Side Stick Unit, General Requirements for Fly-By-Wire Transport and Business A/C</td>
<td>Bettini</td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td>Discussion</td>
<td>Redundancy Management of Flight Critical Sensors for Autonomous Vehicles</td>
<td>Dones</td>
<td>Covington, Fazi</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:30</td>
<td>ARP94910</td>
<td>VMS Flight Control Design, Installation and Test for Military, Unmanned Aircraft, Specification for</td>
<td>Fazi, Neppach</td>
<td>Covington</td>
</tr>
<tr>
<td>2:30</td>
<td>ARP5775</td>
<td>Skew and Disconnect Detection in High Lift Systems</td>
<td>Perrin</td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>Lesson Learned</td>
<td>Digital Signal Wrap-Around Integrity Checks</td>
<td>Dones</td>
<td>Covington</td>
</tr>
<tr>
<td>4:30</td>
<td>ARP5770</td>
<td>Mechanical Control Design Guide</td>
<td>Maeda</td>
<td>Huynh</td>
</tr>
<tr>
<td>5:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Web meetings are anticipated for the following documents prior to the meeting. Please contact the panel secretary to include your sessions in the agenda. Please contact the document sponsor if you are interested in participating.

<table>
<thead>
<tr>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARP94910</td>
<td>VMS Flight Control Design, Installation and Test for Military, Unmanned Aircraft, Specification for</td>
<td>Neppach, Fazi</td>
<td></td>
</tr>
</tbody>
</table>
### HYDRAULIC SERVO ACTUATION ~ PANEL A-6B1
**Time:** 9:30 AM-2:30 PM

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30-10:00</td>
<td>ARP5554</td>
<td>Guidelines for Specifying LVDTs and RVDTs.</td>
<td>Baranovskis</td>
<td></td>
</tr>
<tr>
<td>10:00-10:30</td>
<td>New Projects</td>
<td>Resolver Standard: Baranovskis: Scope and Outline</td>
<td>Baranovskis</td>
<td></td>
</tr>
<tr>
<td>10:30-12:00</td>
<td>New Projects</td>
<td>Hydraulic Actuators, Modeling and Simulation Marini: Scope and Outline</td>
<td>Marini</td>
<td>Greetham, Huynh, Maré, Jacazio, Perin</td>
</tr>
<tr>
<td>1:30-2:00</td>
<td>ARP499</td>
<td>Electrohydraulic servovalve</td>
<td>Simkin</td>
<td></td>
</tr>
<tr>
<td>1:30-2:00</td>
<td>Candidate Projects</td>
<td>Servolop Pressure Feedback Transducer Servo actuator Interface Standard</td>
<td>Greetham</td>
<td></td>
</tr>
</tbody>
</table>

### EHA ~ PANEL A-6B2
**Time:** 8:30-11:00 AM

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-9:00</td>
<td>ARP5772</td>
<td>EHA Reservoirs</td>
<td>Bacchiocchi</td>
<td>All</td>
</tr>
<tr>
<td>9:00-9:30</td>
<td>ARP 6354</td>
<td>EHA Thermal Management</td>
<td>Nist</td>
<td>All</td>
</tr>
<tr>
<td>9:30-10:00</td>
<td>ARP 6352</td>
<td>Sizing Considerations for EHA Pumps and Motors</td>
<td>Barker</td>
<td>All</td>
</tr>
<tr>
<td>10:00-10:30</td>
<td>ARP XXXX</td>
<td>Power Control Electronics for EHA and EMA</td>
<td>Todeschi</td>
<td>All</td>
</tr>
<tr>
<td>10:30-11:00</td>
<td>ARP XXXX</td>
<td>Recommended Trade Considerations</td>
<td>Barker</td>
<td>All</td>
</tr>
</tbody>
</table>

### MECHANICAL AND ELECTROMECHANICAL ACTUATION SYSTEMS PANEL A-6B3
**Time:** 11:00 AM-4:30 PM

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsors</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00-11:30</td>
<td>AIR6016</td>
<td>High Lift Systems Description</td>
<td>Perrin</td>
<td></td>
</tr>
<tr>
<td>11:30-12:00</td>
<td>AIR8442</td>
<td>Considerations for Prevention of Moisture Damage in Aircraft Electro-mechanical Actuation Equipment</td>
<td>Manzanares</td>
<td></td>
</tr>
<tr>
<td>12:00-12:30</td>
<td>AIR6052</td>
<td>Trimmable Horizontal Stabilizer Actuator Descriptions</td>
<td>Todeschi</td>
<td></td>
</tr>
<tr>
<td>1:30-2:00</td>
<td>AIR6226</td>
<td>Trimmable Horizontal Stabilizer Actuator structural load path integrity monitoring principles</td>
<td>Todeschi</td>
<td></td>
</tr>
<tr>
<td>2:00-2:30</td>
<td>AIR5713</td>
<td>In-Service Reliability Data of Continuously Active Ball Screw and Geared Flight Control Actuation Systems</td>
<td>Todeschi</td>
<td></td>
</tr>
<tr>
<td>2:30-3:00</td>
<td>AIR6074</td>
<td>Material Selection and Design Practices for Gear and Jackscrew Actuation Systems</td>
<td>Beffa</td>
<td></td>
</tr>
<tr>
<td>3:00-3:30</td>
<td>ARP6131</td>
<td>Maintenance and Inspection Procedures for Rotary and Linear Mechanical Actuators</td>
<td>Babinski</td>
<td></td>
</tr>
<tr>
<td>3:30-4:00</td>
<td>Proposed AIR</td>
<td>Seals for Electromechanical Actuators</td>
<td>Babinski</td>
<td></td>
</tr>
<tr>
<td>4:00-4:30</td>
<td>Proposed AIR</td>
<td>General Guidelines for Specifying Motor Requirements for Electrically Powered Actuation</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>4:00-4:30</td>
<td>Proposed AIR</td>
<td>Failure Modes for Highly Loaded, Complex Mechanical Actuators</td>
<td>Beaton</td>
<td></td>
</tr>
</tbody>
</table>
### CONTAMINATION AND FILTRATION ~ PANEL A-6C1

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SEALS ~ PANEL A-6C2

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30</td>
<td>ARP6010</td>
<td>Surface Finish Guidelines for Sealing Systems – update on formation of working group and discussion</td>
<td>Gilbert</td>
<td>All</td>
</tr>
<tr>
<td>10:30</td>
<td></td>
<td></td>
<td></td>
<td>WG members</td>
</tr>
<tr>
<td>10:30</td>
<td>Lesson</td>
<td>PTFE Cap strip seal lesson learned</td>
<td>Gilbert, Simkin, Schofield</td>
<td>All</td>
</tr>
<tr>
<td>11:30</td>
<td>AS871</td>
<td>Brief review w.r.t. status of revision to NAS1613</td>
<td>N/A</td>
<td>Zielinski</td>
</tr>
<tr>
<td>12:00</td>
<td>AIRXXXX</td>
<td>Rotary Seals Document – plan / roadmap</td>
<td>Movahead</td>
<td>All</td>
</tr>
<tr>
<td>1:30</td>
<td>AS5781</td>
<td>Change of Scope for document updates. Discussion and agreement</td>
<td>Schofield</td>
<td>Keenan</td>
</tr>
<tr>
<td>2:30</td>
<td>AS5782</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>AS5860</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>AS5861</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>ARP1802</td>
<td>Discuss proposed minor revisions</td>
<td>Louie</td>
<td>All</td>
</tr>
<tr>
<td>3:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FLUIDS ~ PANEL A-6C3

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Issue 3.1, Feb 27, 2020**
### POWER SOURCES ~ PANEL A-6C4
**Time**: 2:30 – 5:30 PM

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:30</td>
<td>ARP6249</td>
<td>Hydraulic Pump Minimum Inlet Pressure Test</td>
<td>Devan</td>
<td></td>
</tr>
<tr>
<td>3:00</td>
<td>AIR560</td>
<td>Missile Hydraulic Pumps</td>
<td>Devan</td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>ARP4943</td>
<td>Ground Support Equipment Hydraulic Systems, Design and Installation, Recommended Practices for</td>
<td>Orgnon</td>
<td></td>
</tr>
<tr>
<td>4:00</td>
<td>AIR6855</td>
<td>Application Guide for Electric Motors, which Drive Hydraulic Pumps</td>
<td>Peters</td>
<td></td>
</tr>
<tr>
<td>4:30</td>
<td>ARP4940</td>
<td>Application Guide for Aerospace Hydraulic Motors</td>
<td>Need sponsor</td>
<td></td>
</tr>
<tr>
<td>5:00</td>
<td>ARP1280</td>
<td>Application Guide for Hydraulic Power Transfer Units</td>
<td>Bergfeldt?</td>
<td></td>
</tr>
</tbody>
</table>

### COMPONENTS ~ PANEL A-6C5
**Time**: 8:30 – 9:30 AM

<table>
<thead>
<tr>
<th>Time</th>
<th>Document #</th>
<th>Title</th>
<th>Sponsor</th>
<th>Requested key participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>ARP4987</td>
<td>Aerospace-Hydraulic Shuttle Valves</td>
<td>Johnson</td>
<td></td>
</tr>
<tr>
<td>9:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
COMMERCIAL AIRCRAFT ~ PANEL A-6A1
Thursday March 19
8:00-9:20 AM

A1.1 Opening Remarks, Attendance and Membership Review – Chair Todeschi

A1.1.1 Attendance and Membership Review – Secretary Huynh will conduct the roll call and new attendees will be asked to identify themselves. Secretary Huynh will also report on the panel membership.

A1.1.2 Review and Approval of Previous Meeting Minutes – Secretary Huynh

A1.2. Project Status – Works in Progress

A1.2.1 ARP6277 (Project A6A1-13-01) - Commercial Aircraft Hydraulic System Sizing – Sponsor, M Plamondon


A1.3. 5 Year Document Review

A1.3.1 ARP4752B - Aerospace - Design and Installation of Commercial Transport Aircraft Hydraulic Systems – Mr. L. Engstrom

A1.3.2 ARP6200 - Test Requirements and Means for Commercial Aircraft Hydraulic Systems – TBD (Volunteer to review the document and recommend disposition needed. Please contact the panel chair if you are interested).

A1.3.3 ARP4925B Aerospace - Design and Installation of Transport Helicopter Hydraulic Systems – Mr. R. P. Reynolds

A1.3.4 ARP4941B Aerospace - General Requirements for Commercial Aircraft Components – Mr. Y. Bergfeldt

A1.4. Project Status – Documents in Development

None planned.

A1.5. Lessons Learned

The panel invites attendees to discuss or present lessons learned for consideration for capture in AIR4543. If no lessons learned are provided, the panel will brainstorm ideas and solicit commitments to bring lessons learned to a future meeting.

Lessons learned from past meetings to be advanced:

A1.5.1 Uncommanded Surface Motion due to Magnet – M. Todeschi

A1.5.2 Others to be announced.

(Continued on next page)
A1.6. **Liaison Reports**

Aircraft Manufacturer Updates – Representatives from Aircraft and Helicopter manufacturers are requested to provide updates on recent developments. Certification authorities also provide activity updates.

- **A1.6.1** FAA R. Jones
- **A1.6.2** EASA C. Harang
- **A1.6.3** Bell E. Covington
- **A1.6.4** Gulfstream S. Nist
- **A1.6.5** Airbus M. Todeschi
- **A1.6.6** Bombardier H. Beaton

A1.7. **Presentations**

The panel invites attendees and potential attendees to present on topics of interest to the panel. Please contact the panel chair to coordinate.

A1.8. **Vice-Chair’s Report**

Report will include a discussion of A-6 short courses covering existing courses, potential new courses, and possible attendees.

A1.9. **Chairman’s Report**

TBD.

A1.10. **Unfinished Business**

A1.11. **New Business**

A1.12. **Adjournment**
A2.1 Opening Remarks, Attendance and Membership Review

A2.1.1 Attendance and Membership Review
Chair J. Rieder will open the meeting and Secretary Marini will conduct a roll call. New attendees will be asked to introduce themselves.

A2.1.2 Approval of Fall 2019 Meeting Minutes
Vice-Chair S. Lohe will request comments on the previous Panel minutes and ask for a vote to approve the minutes.

A2.1.3 Chair’s Report.
Chair Rieder will provide a presentation on news and updates within the Military Aviation community since the last A-6A2 Meeting.

A2.2 Project Status – Work in Progress

A2.2.1 AS5440B (Project A6A2-14-2), Design and Installation Requirements for Aircraft Hydraulic Systems - Mr. C. Marini and Mr. J. Rieder

A2.2.2 AIR1899A (Project A6A2-07-1), Aerospace Military Aircraft Hydraulic System Characteristics - Mr. R. S. Reynolds

A2.2.3 AIR1657B (Project A6A2-08-3), Handbook of Hydraulic Metric Calculations- Mr. C. Marini

A2.2.4 ARP8447 (Project A6A2-17-1), Methodology for Testing Pump Pulsation in Aircraft and Iron Birds - Mr. S. Lohe

A2.2.5 ARP5891 (Project A6A2-19-2), Achieving Cleanliness Standards for Aircraft Hydraulic Systems During Manufacture – Mr. O. Collet

A2.2.6 AS8775A (Project A6A2-19-3), Hydraulic System Components, Aircraft and Missiles, General Specification For- Mr. Perry and Mr. Borla

A2.3 Five Year Review

Five documents are up for five-year review:

A2.3.1 AS5440A Design and Installation Requirements for Aircraft Hydraulic Systems (In Work)

A2.3.2 AIR1899A Aerospace Military Aircraft Hydraulic System Characteristics (In Work)

A2.3.3 AIR1657B Handbook of Hydraulic Metric Calculations (In Work)

A2.3.4 AIR5891 (Project A6A2-19-2) Achieving Cleanliness Standards for Aircraft Hydraulic Systems During Manufacture (In Work)

A2.3.5 AIR8775 Hydraulic System Components, Aircraft and Missiles, General Specification For (In Work)

(Continued on next page)
MILITARY AIRCRAFT ~ PANEL A-6A2
Thursday March 19
9:30-11:00 AM

A2.4 Project Status – Documents in Development
A2.4.1 Project A6A2-19-1 Methodology for Testing Modal Characteristics in Tubing - J. Mr. Rieder

A2.5 Lessons Learned
A2.5.1 Hydraulic System Failures Resulting from Environmental Forcing Frequencies - Mr. J. Rieder

A2.6 Liaison Reports
A2.6.1 None Planned

A2.7 Vice-Chair’s Report
   Report will include a discussion of A-6 short courses covering existing courses, potential new courses, and possible attendees.

A2.8 Presentations
   None planned.

A2.9 Unfinished Business
A2.9.1 In-Service Component and Seal Shelf Life - Secretary Marini will continue his discussion and findings on shelf life of hydraulic components
A2.9.2 ARP1084 vs. ARP6175 - A-6A1 Liaison to give status of documents

A2.10 New Business
A2.10.1 None Planned.

A2.11 Adjournment
A3.1 Opening Remarks, Attendance and Membership Review - Chair Beaton

A3.1.1 Attendance and Membership Review - Secretary Engstrom will call the roll. New attendees will be asked to identify themselves. Panel Chair Beaton will review the panel charter.

A3.1.2 Review and Approval of Minutes from the Fall 2018 Meeting – Secretary Engstrom

A3.1.3 Chairperson’s Report – Panel Chair Beaton will provide an overview of panel activities.

A3.2 Project Status – Work in Progress

A3.2.1 AIR5273A (Project A6A3-12-04) Actuation System Failure Detection Methods - Sponsor U. Perrin

A3.2.2 AIR5875 (Project A6A3-17-04) Methodology for Investigation of Flight Control System Anomalies - Sponsor M. Boas

A3.2.3 ARP5007A (Project A6A3-17-05) Development Process – Aerospace Fly-By-Wire Actuation Systems - Sponsor S. Nist will report. Subcommittee Chair E. Covington to make recommendations regarding update, affirmation, or stabilization.

A3.2.4 ARP6001 (Project A6A3-17-06) Aerospace, Passive Side Stick Unit, General Requirements for Fly-By-Wire Transport and Business - Sponsor P. Bettini

A3.2.5 ARP5770 (Project A6A3-18-02) Mechanical Controls Design Guide - Sponsors T. Maeda or N. Huynh

A3.2.6 ARP94910A (Project A6A3-18-01) VMS Flight Control Design, Installation and Test for Military, Unmanned Aircraft, Specification for - Sponsors F. Fazi

A3.2.7 ARP5428 (Project A6A3-18-03) Utility Systems Characterization, an Overview – Secretary L. Engstrom

A3.3 Five Year Review

A3.3.1 AS10081A (Project A6A-18-02) Terminal Shank Swaging, Dimensions for. Document has been stabilized. The panel voted to transfer the document to A-6C5 at the last meeting. Chair Beaton will report on current status.

A3.4 Project Status – Documents in Development


A3.4.2 ARP5775 (Project A6A3-07-03) Skew and Disconnect Detection in High Lift Systems - Sponsor U. Perrin or P. Baranovski

(Continued on next page)
FLIGHT CONTROL AND VEHICLE MANAGEMENT SYSTEMS
PANEL A-6A3
Friday March 20
8:00-10:00 AM

A3.5 Lessons Learned

The panel invites attendees to discuss or present lessons learned for consideration for capture in AIR4543. If no lessons learned are provided, the panel will brainstorm ideas and solicit commitments to bring lessons learned to a future meeting. Currently planned:

A.3.5.1 (Project A-6A3-19-03) Digital Signal Wrap-Around Integrity Checks – F. Dones

A3.6 Liaison Reports

The panel invites liaison and other members to present on topics of interest to the panel from your organization.

A3.6.1 Government Agencies - None yet scheduled.
A3.6.2 SAE ASG - Avionic Systems Group, Mr. Fazi
A3.6.3 ASTM F44 Committee on General Aviation Aircraft, Mr. S. Alarie

A3.7 Presentations

The panel invites members and guests to present on topics of interest to the panel. Currently planned presentations include:

A3.7.1 Redundancy Management of Flight Critical Sensors for Autonomous Vehicles. Mr. F. Dones will discuss the results of the breakout session.

A3.7.2 Results from 2018 Pilot Control Muscular Forces Experiment by Mr R. Jones.

A3.8 Vice Chair’s Report

Report will include a discussion of A-6 short courses covering existing courses, potential new courses, and possible attendees.

A3.9 Unfinished Business

A3.10 New Business

A3.11 Adjournment
B1.1 Opening Remarks – Chairman Dan Ziertien

B1.1 Attendance and Membership Review – Secretary Simkin
B1.2 Approval of Fall 2019 Meeting Minutes - Chairman Ziertien
B1.3 Chairman’s Report – Ziertien

B1.2 Project Status – Work in Progress

B1.2.1 ARP5554 (Project A6B1-07-01), “Guidelines for Specifying LVDTs and RVDTS.” Mr. Baranovskis will present and discuss the status of this new document.


B1.2.3 ARP490G (Project A6B1-13-02) “Electrohydraulic Servovalves” Mr. Simkin will report the status of the revision to this document.

B1.2.4 ARP-TBD (Project A6B1-19-01) “Guidelines for Specifying Synchro/Resolvers”. Mr. Baranovskis will present the status of this new document.

B1.2.5 ARP-TBD (Project A6B1-18-01) “Modeling and Simulation Considerations for Actuation Systems”. Mr. Marini will report on the status of this new document.

B1.2.6 ARP5796A (Project A6B1-19-03) “Flight Critical Control Valves, Military Aircraft” Mr. Ziertien will report on the status of this document revision.

B1.3 Five-Year Document Review


B1.3.2 ARP4493B (Project A6B1-19-05) “Aerospace – Direct Drive Servovalves”. Mr. Greetham will present results of his review and proposal for this document.

B1.4 Project Status – Documents in Development

B1.4.1 ARP-TBD (Project A6B1-19-02) “Dynamic Seal Comparative Test and Qualification Methods”. Mr. Ziertien will report on this new project

B1.4.2 ARP-TBD (Project A6B1-20-01) “Servolnloop Pressure Feedback Transducer”. Mr. Greetham will report on this new project.

(Continued on next page)
HYDRAULIC SERVO ACTUATION ~ PANEL A-6B1
Thursday March 19
1:30-2:50 PM

B1.5 Lessons Learned

B1.5.1 “System Modeling” by Dave DeFusco

B1.5.2 Solicitation for future Lessons Learned

B1.6 Liaison Report

None

B1.7 Vice Chairman Report

Vice Chairman Greetham will emphasize and discuss potential Hydraulic Servo Actuation topics for the panel consideration and short courses, covering existing courses, potential new courses, and possible attendees.

B1.8 Presentations:

None planned.

B1.9 Unfinished Business

B1.9.1 Servoactuator Interface ARP, Mr. Greetham

B1.10 New Business

Panel attendants are encouraged to present specific matters pertinent to Hydraulic Servo Actuation technologies.

B1.11 Adjournment
B2.1 Opening Remarks - Chairman Brian Barker

B2.1.1 Attendance and Membership review - Secretary Perrin
B2.1.2 Fall 2019 meeting minutes review and approval - Secretary Perrin
B2.1.3 Project Status – Works in Progress

B2.2 Five Year Document Review – Chairman Barker will present the status of documents requiring a five year review.

B2.3.1 Project A6B2-07-1, ARP 5772 “EHA Reservoirs” – Mr. Bacchiocchi will report the status of this activity.

B2.3.2 Project A6B2-15-3, ARP 6354 “EHA Thermal Management” – Mr. Nist will report the status of this activity.

B2.3.3 Project A6B2-15-1, ARP 6352 “Sizing Considerations for EHA Pumps and Motors” – Vice Chairman Socheleau will report the status of this activity.

B2.3.4 Project A6B2-15-2, AIR 6353 “EHA/EBHA Applications on Aircraft Programs” – Chairman Barker will report the status of this activity.

B2.3.5 Project A6B2-16-1, ARP XXXX “Power Control Electronics for EHA and EMA” – Mr. Polcuch and/or Mr. Todeschi will report he status of this activity.

B2.3.6 Project A6B2-15-4, ARP XXXX “Recommended Trade Considerations” – Mr. Dillenger will present the status of this activity.

B2.4 EHA Activity Update

B2.4.1 Airbus: Mr. Todeschi

B2.4.2 UTAS: Mr. Socheleau

B2.4.3 Liebherr: Mr. Perrin

B2.4.4 Moog: Mr. Sielaff

B2.4.5 Parker: Mr. Shaheen

B2.4.6 Lockheed: Mr. Fazi

B2.4.7 Gulfstream: Mr. Nist

B2.4.8 Any other updates by meeting attendees

(continued on next page)
B2.5 Lessons Learned

Vice Chairman Socheleau will discuss ongoing Lessons Learned activities. If no lessons learned are provided, the panel will brainstorm ideas and solicit commitments to bring lessons learned to future meeting.

B2.6 Presentations

Presentations related to electrohydrostatic actuation may be presented at this time.

B2.7 Liaison Reports

B2.7.1 Mr. Zatloff will present liaison activity from the Electromechanical Actuation Panel A-6B3

B2.8 Vice Chairman’s Report

Vice Chairman Socheleau will lead a discussion on other specific matters pertinent to EHA technologies and invite inputs from the panel attendees on the future activity of the panel and short courses, covering existing courses, potential new courses, and possible attendees.

B2.9 New Business

B2.9.1 New Business Items pertaining to Electrohydrostatic Actuation may be presented at this time.

B2.10 Adjournment
B3.1 Opening Remarks, Attendance and Membership Review – Chairman Jim Babinski
B3.1.1 Attendance and Membership Review – Secretary David Manzanares
B3.1.2 Fall ’19 meeting minutes review and approval – Secretary David Manzanares
B3.1.3 Chairman’s Report – Chairman Jim Babinski

B3.2 Project Status – Work in Progress
B3.2.1 AIR6074 (Project A6B3-02-2) “Material Selection and Design Practices for Gear and Jackscrew Actuation Systems.” Mr. Beffa will report.
B3.2.2 AIR6016 (Project A6B3-06-1) “High Lift Systems Description” Mr. Perrin and Mr. Anderson will report.
B3.2.3 AIR8442 (Project A6B3-17-1) “Considerations for Prevention of Moisture Damage in Aircraft Electro-mechanical Actuation Equipment” Mr. Manzanares will report.
B3.2.4 ARP Proposal (Project A6B3–19-05) “General Guidelines for Specifying Motor Requirements for Electrically Powered Actuation” Mr. Black will report.

B3.3 Five-Year Document Review
B3.3.1 AIR5713 (Project A6B3–14-01) “In-Service Reliability Data of Continuously Active Ball Screw and Geared Flight Control Actuation Systems.” Mr. Todeschi will report.
B3.3.2 AIR6052 (Project A6B3–16-01) “Trimmable Horizontal Stabilizer Actuator Descriptions” Mr. Todeschi will report.
B3.3.3 ARP5724 (Project A6B3–19-01) “Aerospace – Testing of Electromechanical Actuators, General Guidelines For” Eric Polcuch will report.
B3.3.4 ARP6131 (Project A6B3–19-02) “Maintenance and Inspection Procedures for Rotary and Linear Mechanical Actuators” Mr. Babinski will report.
B3.3.5 AIR6226 (Project A6B3–19-06) “Trimmable Horizontal Stabilizer Actuator structural load path integrity monitoring principles” Mr. Todeschi will report.

B3.4 Project Status – Documents in Development
B3.4.1 AIR Proposal (Project A6B3-19-03) “Failure Modes for High Lift Actuation Load Paths” Ms. Beaton will report.
B3.4.2 AIR Proposal (Project A6B3–19-04) “Seals and Wipers for Electromechanical Actuators” Mr. Babinski will report.

B3.5 Lessons Learned - Vice Chairman Errol Zatloff
“Estimation and Application of the Efficiency of a Mechanical Linear Actuator” Mr. Maeda will report

(continued on next page)
B3.6 Liaison Reports – Mr. Babinski to invite reports as applicable from:

- B3.6.1 Power Sources Panel – Mr. Tom Olthoff
- B3.6.2 Flight Controls Panel – Mr. Floyd Fazi
- B3.6.3 EHA/IAP Panel – Mr. Brian Barker

B3.7 Vice Chairman's Report – Vice Chairman Errol Zatloff

Report will include a discussion of A-6 short courses covering existing courses, potential new courses, and possible attendees.

B3.8 Presentations

B3.9 Unfinished Business

B3.10 New Business

B3.11 Adjournment
C1.1 Opening Remarks, Attendance and Membership Review

C1.1.1 Attendance and Membership Review
C1.1.2 Approval of Fall 2018 Meeting Minutes
C1.1.3 Chairman's Report

C1.2 Project Status—Work in Progress

C1.2.1 MIL-F-8815(ProjectA6C1-94-3) "Filter Housings and Elements". Mr. Riederto report on US Navy up dating MIL-F-8815 per SAE recommendations.

C1.2.2 ARP785B(ProjectA6C1-07-2) "Procedure for the Determination of Particulate Contamination in Hydraulic Fluids by the Control Filter Gravimetric Procedure" Mr. P. Raowill report on the progress of this document.

C1.2.3 ARP1302(ProjectA6C1-09-3) "Filter Patch Testing Procedure for Aerospace Hydraulic Non-Rotating Equipment". Mr. MGAO will report on evaluation of this document.

C1.2.4 ARP5376B (Project A6C1-17-11) "Methods, Locations and Criteria for System Sampling and Measuring the Solid Particle Contamination of Hydraulic Fluids". Mr. N Brown will report on evaluation of this document.

C1.2.5 AIR787 (Project A6C1-19-1) "Filter Element Cleaning Methods" Mr. N. Brown will report on progress of the evaluation of this document.

C1.2.6 ARP4205A (Project A6C1-19-2) "Hydraulic Filter Elements – Method for Evaluating Dynamic Efficiency with Cyclic Flow" Mr. N Brown will report on progress of the evaluation of this document.

C1.2.7 AS4059 (Project A6C1-19-3) "Aerospace Fluid Power – Contamination Classification for Hydraulic Fluids" Mr. N Brown will report on the progress of the evaluation of this document.

C1.2.8 ARP599 (Project A6C1-19-4) "Aerospace – Dynamic Test Method for Determining the Relative Degree of Cleanliness of the Downstream Side of Filter Elements" Mr. K Suri will report on the progress of the evaluation of this document.

C1.3 Five-Year Document Review -WIPS Older Than 5 Years

C1.5 Lessons Learned

Presentations and Panel Validation
Vice Chairman Brown will update the panel on the status of new lessons learned.
If no Lessons Learned are offered, discussion of ideas about what could be presented and commitments to do so.

(Continued on next page)
C1.6 Liaison Reports

Chairman Mothersbaugh and Vice Chair Brown to provide updates on NFPA and ISO documents.

C1.7 Vice Chairman's Report

Report will include a discussion of A-6 short courses covering existing courses, potential new courses, and possible attendees.

C1.8 Presentations

C1.9 Unfinished Business

C1.10 New Business

Chairman Mothersbaugh will call for new business items.

C1.11 Adjournment
C2.1 Opening Remarks, Attendance and Membership Review

C2.1.1 Chairman’s Opening Remarks – Chairman Morgan Gilbert
C2.1.2 Roll Call – Secretary Devin Prate
C2.1.3 Attendance and Membership Review – Chairman Morgan Gilbert
C2.1.4 Approval of Minutes – Secretary Devin Prate

C2.2 Project Status – Work in Progress

C2.2.1 AIR1244B (Project number A6C2-94-4) “Selection of Slipper Seals for Hydraulic-Pneumatic Fluid Power Applications”.
Mr. Andersen to report on the document status and schedule for next ballot.

C2.2.2 ARP7204 (Project number A6C2-17-2) “Polymeric Bearings for Linear Actuators”.
Mr. Prate to report on document status.

C2.2.3 AS3084A, AS3085B, AS3208A, AS3209B, AS3581A (Project number A6C2-18-4a thru e) Various E-25 O-ring/Seal documents to be cancelled as covered by AS83248/1 and AS83248/2
Dr. Zielinski to report on status of documents.


C2.2.5 ARP1231C, ARP1232C, ARP1233B, ARP1234C, MAP3439, MAP3440, MA2010 (Project number A6C2-18-7a thru g) Various E-25 gland and metric o-ring standards transferred to A6C-2 to be updated to include technical and editorial changes. Dr. Zielinski to report on status of documents.

C2.2.6 AS568E (Project number A6C2-18-3) “Aerospace Size Standard for O-Rings”.
Dr. Zielinski to report on status.

C2.2.7 AS7985 (Project number A6C2-19-8) “O-Ring Molded from AMS7601 Butyl Rubber”.
Dr. Zielinski to report on status.

C2.2.8 AS5798A (Project number A6C2-18-1) “Aerospace Size Standard for Oversize O-rings”.
Mr. Schofield to report on status.

C2.2.9 AS8791 (Project number A6C2-19-7) “Hydraulic and Pneumatic Retainers (Back-Up Rings), Polytetrafluoroethylene (PTFE) Resin”
Mr. Schofield to report on status of proposed rationale revision

C2.2.10 AS5860C, AS5861B, AS5781B and AS5782B (Project number A6C2-19-10a thru d) Various Back-up Ring standard updates to delete reference to dimensional stability tests and harmonize formatting. Mr. Schofield to report on status.

C2.2.11 AIR786C (Project number A6C2-19-9) “Elastomer Compatibility Considerations Relative to Elastomeric Sealant Selection”
Mr. Gage to report on status of 5 year review and recent ballot

C2.2.12 ARP1802C (Project number A6C2-19-11) “Selection and Application of Polytetrafluoroethylene (PTFE and TFE) Backup Rings for Hydraulic and Pneumatic Fluid Power Applications”
Ms. Louie to report of status of 5 year review and proposed revision

C2.3 Five Years Document Review

C2.3.1 ARP1833B (Project number A6C2-20-1) “Sealing Techniques for Missile Applications”
New sponsor required for 5 year review or motion to “stabilize”
(Continued on next page)
SEALS ~ PANEL A-6C2
Thursday March 19
4:10-5:30 PM

C2.3.2 AS35769A (Project number A6C2-20-2) "Gasket, Metallic, Encased, Annular, Copper"
New sponsor required for 5 year review or motion to "stabilize"

C2.3.3 AS29561B (Project number A6C2-20-4) "O-ring, Synthetic Lubricant Resistant Molded from AMS-R-7362 Rubber"
New sponsor required for 5 year review or motion to "stabilize"

C2.3.4 AS28772B (Project number A6C2-20-5) ""D" Ring Seal for Shock Struts Molded from AMS-P-25732 Material"
New sponsor required for 5 year review or motion to "stabilize"

C2.4 Project Status – Documents in Development
C2.4.1 AIR6079A (Project number A6C2-15-4) "Selection of Metallic Spring Energized Seals for Aerospace".
Mr. Schofield to report on status of document and work session discussion

C2.4.2 ASxxxx (Project number A6C2-19-1) "O-ring Molded from AMS7361 Material"
Mr. Lindahl to report on status of document and material standard approval in AMS-CE

C2.4.3 AIRxxxx (Project number A6C2-19-5) Rotary Seals Document – Mr. Movahed to report on the development status of this
document and work session discussion.

C2.4.4 ARP6010 (Project number A6C2-19-6) "Surface Finish Guidelines for Sealing Systems".
Mr. Gilbert to report on the document status and work session discussion.

C2.5 Lessons Learned
C2.5.1 Cap Seal Lesson Learned – TBC

C2.6 Liaison Reports

C2.6.2 AMS-CE / P Liaison Reports – Mr. M. Koucathakis to provide report.

C2.6.3 Other Liaison reports – TBC

C2.7 Presentations
C2.7.1 TBA

C2.8 Vice-chair Report
C2.8.1 Discussion of A-6 short courses covering existing courses, potential new courses, and
possible attendees.

C2.8.2 New Technology

C2.9 Unfinished Business
C2.9.1 Update from Mr. Lindahl on low temperature EPR material development and testing. See agenda item C2.4.2

C2.10 New Business

C2.11 Adjournment
C3.1. Opening Remarks, Attendance and Membership Review
   C3.1.1 Attendance and Membership Review
   C3.1.2 Approval of Fall 2019 Meeting Minutes
   C3.1.3 Chairman’s Report

C3.2 Project Status – Work in Progress
   A6C3-18-1 AIR810D – “Degradation Limits of Hydrocarbon-Based Hydraulic Fluids MIL-PRF-5606, MIL-
   PRF-83282 and MIL-PRF-87257 Used in Hydraulic Test Stands” – D. Racke

C3.3. Five-Year Document Review
   AIR810D – “Degradation Limits of Hydrocarbon-Based Hydraulic Fluids, MIL-PRF-5606, MIL-PRF-83282,
   and MIL-PRF-87257 Used in Hydraulic Test Stands” – D. Racke

C3.4. Project Status – Documents in Development
   None

C3.5. Lessons Learned
   If no Lessons Learned are offered, discussion of ideas about what could be presented and commitments
to do so.

C3.6. Liaison Reports

C3.7. Vice Chairman’s Report
   Report will include a discussion of A-6 short courses covering existing courses, potential new courses,
and possible attendees.

C3.8. Presentations
   AS1241D vs ISO 9940. Compare and contrast the differences. Prepare for harmonization. – B. Payne
   Others, TBA

C3.9. Unfinished Business
   The revision of the stabilized document AIR1116B was discussed. Mr. B. Payne agreed to review the
document to determine if it should be cancelled.

C3.10. New Business
   The harmonization of AS1241 and ISO 9940. Comparison of the two showing differences.

C3.11. Adjournment
C4.1 Opening remarks, Attendance and Membership Review

C4.1.1 Attendance and membership review
C4.1.2 Approval of minutes from last meeting- Secretary Mr. B. Gardner
C4.1.3 Chairman’s Report- Chairman Mr. T. Olthoff

C4.2 Project Status – Work in Progress

C4.2.1 ARP6249 (Project A6C4-13-01) - “Hydraulic Pump Minimum Inlet Pressure Test”, Mr. S. Devan to report.

C4.2.2 AIR560 (Project A6C4-13-3) - “Missile Hydraulic Pumps”, Mr. S. Devan to report.

C4.2.3 ARP4943 (Project A6C4-14-1) - “Ground Support Equipment Hydraulic Systems, Design and Installation, Recommended Practices for”, Mr. C. Orgnon to report.

C4.2.4 AIR6855 (Project A6C4-14-3) - “Application Guide for Electric Motors, which Drive Hydraulic Pumps”, Mr. J. Peters to report.

C4.3 Five Year Document Review

C4.3.1 ARP4940 - “Application Guide for Aerospace Hydraulic Motors”

C4.3.2 ARP1280 - “Application Guide for Hydraulic Power Transfer Units”

C4.4 Project Status – Documents in Development

C4.5 Lessons Learned

C4.6 Liaison reports

C4.7 Vice Chairman’s Report

Report will include a discussion of A-6 short courses covering existing courses, potential new courses, and possible attendees.

(Continued on next page)
C4.8 Presentations

C4.9 Unfinished Business
Other unfinished business as needed.

C4.10 New Business
Review stabilized documents and determine status.

C4.11 Adjournment
C5.1 Opening Remarks, Attendance, and Membership Review

C5.1.1 Opening Remarks – Chairman Mr. M. Borla
C5.1.2 Attendance and Membership Review – Secretary Mr. D. Novak
C5.1.3 Approval of Previous Meeting Minutes – Secretary Mr. D. Novak
C5.1.4 Chairman’s Report – Chairman Mr. M. Borla

C5.2 Document Status – Works in Progress

C5.2.1 AS 4741 (Project A6C5-14-01) “Aerospace – Hydraulic Switching Valve, Pressure or Pilot Operated”. Mr. G. Loftis will report on the status of this document.

C5.2.2 AS 4835 (Project A6C5-11-2) “Aerospace Fluid Power – Hydraulic Thermal Expansion Relief Valves”. Mr. J. Dickey will report on the status of this document.

C5.2.3 ARP 4945 (Project A6C5-18-3) “Aerospace Solenoid Valve, Hydraulic, Three Way, Two Position, Direct Acting”, Mr. T. Cleveland will report on the status of this document.

C5.2.4 ARP 4946 (Project A6C5-11-1) “Aerospace-Valves, Check, Hydraulic, Aircraft and Missile”, Mr. C. Aunchman will report on the status of this document.

C5.2.5 ARP 8450 (Project A6C5-18-2) “Aerospace-Recommended Design and Test Requirements for Quantity Measuring Hydraulic Fuses”. Mr. P. Keenan will report on the status of this document.

C5.2.6 AS 28889B (Project A6C5-19-2) “Aerospace- Valve, Air, High Pressure Charging, 5000 psi”, Mr. P. Keenan will report on the status of this document.

C5.2.7 AS 5466 (Project A6C5-18-1) “Aerospace-General Requirements for Hydraulic Fuse – Quantity Measuring”. Mr. P. Keenan will report on the status of this document.

C5.2.8 ARP 4987 (Project A6C5-17-1) “Aerospace-Hydraulic Shuttle Valves”. Mr. E. Johnson will report on status of this document.

C5.3 Document Status - Five Year Review

C5.3.2 AS 40401 “Solenoid, Electrical, General Specification For”
Mr. J. Dickey and Mr. M. Borla will report on the status of this document.

(Continued on next page)
C5.4 Documents in Development

None at this time

C5.5 Lessons Learned

Presentations and Panel Validation
If no Lessons Learned are offered, discussion of ideas about what could be presented and commitments to do so.

C5.8 Vice Chairman’s Report– Vice Chairman Mr. G. Loftis

Report will include a discussion of A-6 short courses covering existing courses, potential new courses, and possible attendees.

C5.9 Unfinished Business

Other unfinished business as needed.

C5.10 New Business

Panel members and guests are encouraged to introduce items of general interest for panel action.

C5.11 Adjournment
1. Welcome and Introduction To All A-6 Members and Guests - Chairman Halley
   1.1 Committee A-6 Structure and Leadership
   1.2 Meeting 168 Feedback/Reminders

2. Committee A-6 Roll Call and Review of Membership - Secretary Dickey

3. Approval of Minutes of Meeting No. 167 - Secretary Dickey

4. Membership Changes - Secretary Dickey

5. Project status
   5.1 AIR4543 - Aerospace Hydraulics and Actuation Lessons Learned - C. Marini
   5.2 AS1290B - Graphic Symbols for Aircraft Hydraulic and Pneumatic Systems – P. Keenan
   5.3 AIR737 – “Aerospace Hydraulic and Pneumatic Specifications, Standards, Recommended Practices, and Information Reports” – I. Halley

6. Steering Council Summary Report- Chairman Halley

7. Short courses-Vice Chairman van den Bossche
   Presentation of the Fall 2020 selected short courses:
   - Design Considerations for Hydraulically Powered FBW Flight Control Actuation Systems by Tom Greetham
   - Aerospace Hydraulic Components by Jeff Dickey

8. SAE Report - Ms. D. Lloyd

9. Liaison Reports
   9.1 EASA
   9.2 FAA
   9.3 Other SAE Committees
   9.4 Academia and research Prof G. Jacazio

10. Recognition/Awards - Chairman Halley

11. Sub-committee and Panel Reports
    10.1 A-6A Report - Subcommittee Chairman E. Covington
    10.2 A-6B Report - Subcommittee Chairman M. Besliu
    10.3 A-6C Report - Subcommittee Chairman R. Zielinski

12. Presentation
    None so far

13. New Business/Chairman’s Summary - Chairman Halley
Breakout session organization reminder

Background

The Steering Council has concerns that the breakout sessions are not working in the best interest of the Committee (as experienced in the Milwaukee meeting)... and would like to remind the Panels that these sessions are meant to provide the opportunity for the panels to more efficiently develop their documents in a more timely manner to better meet the needs of the industry.

Objectives of the breakout sessions

The breakout sessions consist of a succession of approx 1 hour individual project working group meetings, generally following the format defined below. The objective is to provide the opportunity for the working group members to more efficiently plan, schedule, review, and address issues to get documents approved and released in a more timely manner. Progress and issues need to be tracked and reported to the Panel.

Document sponsors

Document Sponsor assess the need for, and proposes, a working session for the next A-6 meeting, ahead of time, i.e. at the panel meeting or at the latest, 2 months prior to the meeting, to be mentioned in the meeting agenda. Net meetings between A-6 meetings shall also be considered.

Document Sponsor runs the project meeting
Sponsor contacts key document participants ahead of meeting, open to any others
Sponsor makes sure that electronic/hard copies of the document to be discussed are available at the meeting
Sponsor follows Project Meeting format:
Document Status/Schedule
Document Needs
Document Issues
Document Actions including net meetings or a break out session at the next A-6 meeting

Sponsor prepares Panel Meeting presentation according to the attached Project Reporting slides to be provided to Panel Vice Chair before the panel meeting. These two slides are required for all panel documents, whether there has been a breakout meeting or not. Ideally, these are the only slides needed. If other slides are needed to obtain a voice vote during the panel meeting, they can be added. The technical issues should be resolved prior to vote at the panel.

Sponsors planning not to attend the A-6 meeting make sure ahead of meeting that either co-sponsors or specifically delegated persons will run the project meeting and let the Panel Chair know prior to the meeting.

Panel chair

Panel chair makes sure prior to the meeting that all documents in progress that deserve a project meeting are addressed either the sponsor or an identified co-sponsor will be available for running the project meeting Provides to the Subcommittee Chair prior to the meeting a list of the proposed project meetings with the names of the sponsor in charge and of the key participants Makes sure throughout the day that the project meetings are running well, helps where necessary, and directs panel members and new comers if necessary

In the event that there is no working session proposed by document sponsors, or not enough to take benefit of available time, it is the duty of the panel chair to propose activities for the full day like collectively looking at the
5 year review candidates, or discussing impact of emerging technologies, or discussing industry concerns, or discussing need for short courses, or reviewing lessons learned, or thinking about contribution of the panel to future symposium etc...

**Subcommittee chair**

The subcommittee chairman has the visibility on 3 to 6 panel workshop agendas, he is then in a position to:

- Balance attendance and time dedicated to each project meeting
- Prepare time allocation for the project meetings taking into account as far as possible availability of sponsors and key participants throughout the day
- Provide ahead of meeting a table presenting the data above (projects, sponsor, key participant, time). These tables are to be shown as part of the A-6 meeting agenda, at the Welcome meeting and to be posted during the day
- Make sure throughout the day that the projects meetings are running well, helps where necessary, and directs panel members and new comers if necessary

**Panel members**

Those identified as “key participants” by the sponsors will be invited to attend the associated meetings

Others will be invited to select the project meetings of their choice or may be directed by the Sub committee or panel chair if attendance needs to be balanced

**Newcomers**

Will be invited to select the project meetings of their choice on the basis of the information displayed at the Welcome meeting, or details given by sponsors, panel or sub committee chairs

**Facilities**

Rooms will be available for each panel, to run meetings in parallel, digital projectors will be provided.

**Between meetings**

Sponsor are encouraged to continue working through e-mail, or arrange net meetings if appropriate.

**Reporting slides**

The 2 boxes in the yellow section of slide 2, to be checked by the sponsor, are intended to encourage Web meetings between our biennial committee meetings, or to better plan working sessions ahead of time.
OVERVIEW

This four hour short course provides an overview of hydraulic system design of typical business and commercial aircraft. Topics will include the principles, system architectures, power sources, and the main components and technologies of hydraulic systems including hydraulic power generation, filtration, fluid storage, distribution, sensing and control. The step by step process of designing a hydraulic system will also be reviewed. Additionally, future trends in hydraulic systems will be discussed.

Learning Objectives
By attending this seminar, you will be able to:
- Explain the operating principles and design process of an aircraft hydraulic system
- Identify system architectures attributes, including those that affect aircraft safety
- Identify power sources for hydraulic systems and how they operate
- Identify the various components of hydraulic systems
- Describe the hydraulic system design and certification process

Who Should Attend
This seminar is designed for engineers, program managers, executives, and other key personnel with little or no previous hydraulic system knowledge or experience.

Prerequisites
None

TOPICS / OUTLINE

General Introduction to Aircraft Hydraulic Systems
Hydraulic System Terminology and Standards
A Brief History of Aircraft Hydraulic Systems
System Engineering - Principles and Practice
Requirements Quality
Hydraulic System Design and Certification
Proposal Phase
Preliminary Design Phase
Detail Design Phase
Aircraft Production Build and Test Phase
Flight Test and Certification Phase
Hydraulic Interface with Utility Systems
Fluid Conveyance System Design
Introduction to Hydraulic Fluids
Market Trends and Future Technologies
INSTRUCTORS: Jon Jeffery and Steve Lohe

Jon Jeffery has been involved with the design and certification of more than 15 military and commercial aircraft hydraulic systems during a 34 year career.
Parker (Hydraulic Systems Div): 1993 – 2015 (22 years) 
Jon is currently working for Hummingbird Aero LLC, an engineering services firm, as President & CEO. He was Chairman for SAE A-6, the Aerospace Actuation, Control and Fluid Power Systems standards committee from 2009 - 2015.

Steve Lohe has been in subsystems design at McDonnell Douglas/Boeing for thirty two years, mostly working hydraulic system design and analysis. He has worked hydraulics design for A-12, AV-8B, F/A-18E/F, F-15 Fly-by-Wire upgrade, MQ-25, T-7A and several proprietary programs. He has been responsible for the architecture and specification of several clean sheet hydraulic systems, including primary flight control actuation procurement. In addition, he had primary responsibility for the fuel system on X-45C and the environmental control systems on a proprietary proposal effort.
He is currently Vice-Chair of the SAE A-6A2 Military panel.
He received his B.S. in Mechanical Engineering from University of Missouri – Columbia, and his M.S. in Mechanical Engineering from Washington University.

Fees: $425.00; Discount rate for registration before Feb 17, 2020: $325.00

.4 CEUs
You must complete all course contact hours and successfully pass the learning assessment to obtain CEUs.

To register on line: https://www.sae.org/learn/content/c1205/

Or contact SAE Customer Service at 1-877-606-7323 (724/776-4970 outside the U.S. and Canada) or at CustomerService@sae.org.
C1518
Flight Control Actuation Systems,
Considerations on Architecture Design and System Installation

Monday March 16
1:30– 5:30 PM

By Dominique van den Bossche

OVERVIEW

The purpose of this four hour short course is to provide information to understand how is established the basic architecture of a Flight Control Actuation System of a transport airplane, i.e. understanding the rationale for the distribution of the control surfaces, power sources, actuators and computers.

Learning Objectives
By attending this seminar, you will be able to:
Understand the Flight Control Actuation System main requirements
Identify technical alternatives covering various aspects of Flight Control Actuation System architecture
Identify the impact of some installation constraints on Control Actuation System architecture
Describe various examples of Flight Control Actuation System architectures

Who Should Attend
This seminar is designed for engineers, executives, and other key personnel with little or no previous flight control knowledge or experience.

TOPICS / OUTLINE

Actuation System Architecture Driving Requirements
  Certification
  Particular Risk
  MMEL requirements
  Margin on failure probabilities
  Arbitrary failure conditions to be covered
  Dissimilarity

Actuation System Architecture Design Considerations
  How many control surfaces
  Balanced vs unbalanced surfaces
  Mechanical vs powered system
  How many power sources
  Electric vs hydraulic power sources
  How many actuators per surface
  Active/active vs active/std-by & double activation
IMA vs EHA
EBHA vs EHA
How many computers
Centralized vs distributed electronics
COM/MON vs triplex voting
Dissimilarity (electronics, power sources, back-up system)
Back-up system
Pilot Controls
Side stick vs control column
Active vs passive side stick
Considerations On System Installation
 UERF and System Routing
 Bird strike and segregation
 Electric actuator thermal management
 Fire prevention
 Lightning Strike
 Actuator installation configurations
Actuation system architecture examples
 System architecture analysis principle
 Architecture examples

INSTRUCTOR: Dominique van den Bossche

Dominique van den Bossche is retired from Airbus since Jan 1st 2009, and is now an independent consultant, mainly for European and US Flight Control Actuation companies / organizations. He was formerly appointed as Head of Department, in charge of the Primary Flight Control Actuation & Hydraulics Department in the Airbus Engineering organization. He was covering R&T, design, development, validation and in-service engineering support of the Primary Flight Control Actuation, Hydraulic Generation and Hydraulic Distribution equipment, for all Airbus models from A300B to A380, A400M and A350, with a team of 115 engineers located in Toulouse France, Hamburg and Bremen Germany.

He received a Master’s Degree in Aeronautics in 1971, after a 3 year training at the French “Ecole Nationale Supérieure d’ Ingénieurs de Constructions Aéronautiques”.

He has been teaching Flight Control Actuation Systems at the Institut Universitaire de Technologie (IUT), Blagnac, France, to students preparing an Aeronautical Maintenance degree and formerly at the Ecole Nationale de l’Aviation Civile (ENAC), in Toulouse, France, and giving lectures at the Institut National des Sciences Appliquées in Toulouse, Technische Universität Hamburg, Beihang University Beijing and Politecnico di Torino. He his giving training courses at SAE International and at many aerospace companies/organizations.

He holds 4 patents involving flight control actuation equipment design and application. He has been presented an award by the French Academy of Technology in 2007 for his achievements on electrohydrostatic actuation technology.

Fees: $425.00; Discount rate for registration before Feb 17, 2020: $325.00

.4 CEUs
You must complete all course contact hours and successfully pass the learning assessment to obtain CEUs.

To register on line : https://www.sae.org/learn/content/c1206/

Or contact SAE Customer Service at 1-877-606-7323 (724/776-4970 outside the U.S. and Canada) or at CustomerService@sae.org.
Anti-Trust Statement: In discharging their responsibilities, members of the Technical Standards Board, Councils/Division, and Technical Committees function as individuals and not as agents or representatives of any organization with which they may be associated, except that government employees participate in accordance with governmental regulations. Members are appointed to SAE Technical Committees on the basis of their individual qualifications which enable them to contribute to the work of the Committee.

Patent Disclosure: Each SAE Technical Committee or SAE working group member would be required to disclose at specified times during a development process all patents and patent applications that are owned, controlled or licensed by the member, member’s employer or third party and that the member believes may become essential to the draft specification under development. The member would make this disclosure based on the member’s good faith and reasonable inquiry. If SAE International receives a notice that a proposed SAE Technical Report may require the use of an invention claimed in a patent, the respective part of the SAE Technical Standards Board Policy will be followed.

IP Statement: SAE’s intellectual property is its most valuable asset. As such, the Society expends considerable resources maintaining and protecting its rights to its intellectual property. SAE reserves the right to copyright any of its print products, electronic products, databases, audio/visual products and any other subject matter. This is intended to protect SAE and its members from unauthorized copying and distribution of SAE intellectual property. SAE’s intellectual property may only be used in a manner that furthers the organization’s purposes.

It is also SAE policy that the copyrights and other intellectual property rights of third parties be respected and not infringed upon by SAE or any of its committees, or any employee, member or other person acting on behalf of SAE.

As a participant in SAE Technical Committees, individuals agree that the collective work of the committee(s) is the property of SAE, and SAE is charged with its publication, dissemination, and protection.
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Committee</th>
<th>Room Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun. 3/15</td>
<td>6:00 – 9:00 pm</td>
<td>Steering Council</td>
<td>Room 215</td>
</tr>
<tr>
<td>Mon. 3/16</td>
<td>8:30 am – 12:30 pm</td>
<td>Short Course C1205 – Introduction to Aircraft Hydraulic System Design and Certification</td>
<td>Room 101</td>
</tr>
<tr>
<td></td>
<td>1:30 pm – 5:30 pm</td>
<td>Short Course C1518 - Flight Control Actuation System Considerations on Architecture Design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 am – 8:30 am</td>
<td>Welcome and Introduction to Committee A-6</td>
<td>Room 211</td>
</tr>
<tr>
<td></td>
<td>8:30am – 9:30am</td>
<td>Newcomers Welcome</td>
<td>Ballroom A</td>
</tr>
<tr>
<td></td>
<td>9:30am – 2:30pm</td>
<td>A-6B1 Hydraulic Servo Actuation Panel Document Work Session</td>
<td>Ballroom A</td>
</tr>
<tr>
<td></td>
<td>2:30pm – 5:30pm</td>
<td>A-6C4 Power Sources Panel Document Work Session</td>
<td>Room 105</td>
</tr>
<tr>
<td></td>
<td>8:30am – 9:30am</td>
<td>Family Meet and Greet</td>
<td>Ballroom B</td>
</tr>
<tr>
<td></td>
<td>9:30am – 3:30pm</td>
<td>A-6C2 Seals Panel Document Work Session</td>
<td>Room 105</td>
</tr>
<tr>
<td></td>
<td>8:30am – 9:30am</td>
<td>A-6A1, A-6A2 &amp; A-6A3 Combined Session</td>
<td>Ballroom C</td>
</tr>
<tr>
<td></td>
<td>9:30am – 5:30pm</td>
<td>A-6A3 Flight Control &amp; Vehicle Management Systems Panel Document Work Session</td>
<td>Room 105</td>
</tr>
<tr>
<td></td>
<td>8:30am – 9:30am</td>
<td>A-6C5 Components Panel Document Work Session</td>
<td>Room 105</td>
</tr>
<tr>
<td></td>
<td>9:30pm – 3:30pm</td>
<td>A-6A2 Military Aircraft Panel Document Work Session</td>
<td>Room 105</td>
</tr>
<tr>
<td></td>
<td>8:30pm – 11:00am</td>
<td>A-6B2 Electrohydrostatic Actuation Panel Document Work Session</td>
<td>Room 204</td>
</tr>
<tr>
<td></td>
<td>11:00am – 5:30pm</td>
<td>A-6B3 Electro-Mechanical Actuation Document Work Session</td>
<td>Room 204</td>
</tr>
<tr>
<td></td>
<td>6:00pm – 8:00pm</td>
<td>Standards Reception</td>
<td>Lower Level Lobby</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Convention Center</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>Committee</td>
<td>Room Assigned</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Tues. 3/17</td>
<td>8:00 am – 11:00 am</td>
<td>A-6 and AE-7 Combined Committee Meeting</td>
<td>Ballroom C</td>
</tr>
<tr>
<td></td>
<td>12:30pm-5:30 pm</td>
<td>Tour of JPL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 am – 9:00 am</td>
<td>AMS P Polymeric Materials Committee</td>
<td>Ballroom B</td>
</tr>
<tr>
<td></td>
<td>9:30 am – 5:00 pm</td>
<td>AMS CE Elastomers Committee</td>
<td></td>
</tr>
<tr>
<td>Wed. 3/18</td>
<td>8:00 am – 5:00 pm</td>
<td>A-6 to attend AeroTech Sessions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 am – 5:00 pm</td>
<td>AMS CE Elastomer Committee</td>
<td>Ballroom B</td>
</tr>
<tr>
<td>Thurs. 3/19</td>
<td>8:00 am – 9:20 am</td>
<td>A-6A1 Commercial Aircraft Panel/Committee Meeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:30 am – 11:00 am</td>
<td>A-6A2 Military Aircraft Panel/Committee Meeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 am – 12:00 pm</td>
<td>A-6C3 Fluids Panel/Committee Meeting</td>
<td>Room 211</td>
</tr>
<tr>
<td></td>
<td>1:30 pm – 2:50 pm</td>
<td>A-6B1 Hydraulic Servo Actuation Panel/Committee Meeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:50 pm – 4:10 pm</td>
<td>A-6B2 Electrohydrostatic Actuation Panel/Committee Meeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:10pm – 5:30pm</td>
<td>A-6B3 Electro-Mechanical Actuation Panel/Committee Meeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12:00 pm – 1:30 pm</td>
<td>A-6 Steering Committee Lunch Meeting (closed)</td>
<td>Room 209/210</td>
</tr>
<tr>
<td></td>
<td>11:00 am – 12:00 pm</td>
<td>A-6 Meets EASG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 pm – 2:50 pm</td>
<td>A-6C4 Power Sources Panel/Committee Meeting</td>
<td>Ballroom B</td>
</tr>
<tr>
<td></td>
<td>2:50pm – 4:10pm</td>
<td>A-6C5 Components Panel/Committee Meeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:10 pm – 5:30 pm</td>
<td>A-6C2 Seals Panel/Committee Meeting</td>
<td></td>
</tr>
<tr>
<td>Fri. 3/20</td>
<td>8:00 am – 10:00 am</td>
<td>A-6A3 Flight Control and Vehicle Management Systems Panel/Committee Meeting</td>
<td>Room 211</td>
</tr>
<tr>
<td></td>
<td>8:00 am – 10:00 am</td>
<td>A-6C1 Contamination and Filtration Panel/Committee Meeting</td>
<td>Ballroom B</td>
</tr>
<tr>
<td></td>
<td>10:00 am – 12:00 pm</td>
<td>A-6 Main Committee Meeting</td>
<td></td>
</tr>
</tbody>
</table>