

MINUTES

of the

3rd MMPDS Coordination Meeting

Held in:

Las Vegas, NV

April 14-17, 2003

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I. Introduction of Attendees

Included in Attachments is a Distribution List for the Minutes of the 3rd MMPDS Coordination Meeting. Additionally, a list of actual Coordination Meeting attendees, indicating the meetings they attended, has been included. (Refer to Pages: Attach -1- through Attach -14-, and Attach -15- through -16-, respectively.)

II. Chairman's Remarks – *John Bakuckas, FAA*

I wanted to take this opportunity to provide a status update on current events and planned activities for the MMPDS. This year, 2003, marks the first year of publication of the MMPDS Handbook and the final year of publication of MIL-HDBK-5. For this year only, MMPDS-01 and MIL-HDBK-5J will have identical contents. In the spring of 2004, when the 1st Change Notice of MMPDS-01 is published, MIL-HDBK-5 will be designated noncurrent and MMPDS will become the only government-recognized source in the U.S. of published design allowable properties for metallic commercial and military aircraft and aerospace structures and mechanically fastened joints. In this way, the 65-year legacy of MIL-HDBK-5, and its predecessor ANC-5, will be maintained.

The FAA recognizes that the Handbook is critically important to aircraft certification and continued airworthiness. Government and industry coordination is essential to maintain the integrity of both the design allowable and guideline development processes. As such, the FAA has every intention of continuing to fund the core activities as required to maintain the Handbook's continued existence. The FAA will continue the technical coordination process, working closely with industry and other government agencies to keep the MMPDS current through periodic revisions and change notices. However, the FAA is the sole government agency funding this effort. In this time of shrinking budgets and changing internal priorities, the risk level is too high to have a single government agency funding this effort over a long period of time. Broad-based funding must be developed to ensure the long-term health of the MMPDS.

An MMPDS Management Plan has been drafted outlining our efforts to establish more sustainable and equitable sponsorship of the Handbook. The goal of this plan is to maintain the Handbook technical coordination process for establishing the statistically based material and fastener system allowables required for aircraft and aerospace vehicle certification and continued airworthiness. As described in the Management Plan, the FAA would like to share the sponsorship of the Handbook with other government and industry partners with the FAA committing

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to 1/3 the total effort to support the Handbook activities by September 2007. Please feel free to provide input and feedback to the MMPDS Management Plan. We want to develop a plan that we all can support.

The GSG and ISG will have to work closely together to realize these goals. As part of our plan, we will explore selling the Handbook and products and using potential profits to support further developments. Our first step is to develop a commercialization plan with market surveys, feasibility studies and mechanisms for distribution. The first draft of the commercialization plan will be released at our next coordination meeting.

I want to thank all participants of the General Coordination Committee for their time and effort. In closing, I am confident that if we all work together, we will continue to maintain and improve the Handbook tradition.

III. Approval of 2nd MMPDS Meeting Minutes

One significant correction to the 2nd meeting minutes was discussed and approved. This proposed correction was included with the 3rd meeting agenda. The approval of Item 02-27 **Revision of Table 9.10.1 in Revised Chapter 9** was inadvertently omitted from the draft minutes. This correction to the 2nd MMPDS meeting minutes was approved. The remainder of the minutes was approved as distributed.

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IV. General Discussion Items

CHAPTER 1. GENERAL

No. Item No. **AMS Coordination**

A status report of AMS specifications of interest was presented by J. Jackson, Battelle. Charts of the draft AMS specifications, the current AMS Specifications being revised, and additional AMS specifications of interest have been included in the Attachments section of this document.
(Refer to Pages: Attach C1-1 through C1-5)

Action: Item Continued

No Item No. **Meetings of Potential Interest to MMPDS Coordination Members**

R. Rice, Battelle reviewed the list of meetings and pointed out that the current list also contains relevant technical society websites.

Action: Item Continued

No Item No. **Government Steering Group. (GSG)** J. Bakuckas led discussions within the GSG meeting on Monday. The main topic of discussion was the previously cited MMPDS Management Plan.

No Item No. **Airframer Steering Group. (ASG)** B. Sova, The Boeing Company, provided an ASG status report at the GCC meeting on Thursday morning. The ASG reviewed the guideline proposal included in the agenda package under Item 94-26, "Production Methods and Their Impact on Design Allowables." The ASG also reviewed the No Item No., "Review of Currency of Existing Database on Legacy Alloys." The status of both of these items is covered later in these minutes.

No Item No. **Industrial Steering Group. (GCC)** R. Rice led discussions within the ISG meeting on Monday and gave a status report at the GCC meeting on current ISG-supported technical activities.

Action:

- Continued
- ISG membership task group established with R. Goode, Battelle, as lead
- ISG to complete draft MMPDS commercialization plan prior to 4th MMPDS coordination meeting (R. Rice as lead)
- B. Sova elected new ISG
- Publish detailed 11th ISG meeting minutes in ISG website

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No Item No. **Guidelines Task Group. (GTG)** R. Rice led a discussion of current Chapter 9 items in the Guidelines Task Group meeting, which took place on Tuesday. The status of individual guideline items is covered later in these minutes.

No Item No. **Materials Task Group. (MTG)** J. Jackson and R. Rice led discussion of new and continued materials items for Chapters 2 through 7 in the Materials Task Group meeting on Wednesday. The status of individual materials items is covered later in these minutes.

No Item No. **Statistics Working Group. (SWG)** R. Rice led discussion of new and continued statistics items at the Statistics Working Group meeting on Tuesday. This included a presentation by C. Davies, FAA Technical Center, on current and future statistical procedures of MIL-HDBK-17 (see Special Presentations, page -57-). Also discussed was collaboration by the two handbooks' subcommittees responsible for statistical guidelines development. The status of individual statistics items is covered later in these minutes.

No Item No. **LAM Working Group. (LAMWG)** R. Rice and P. Kobryn, AFRL, led technical discussions at the Laser Additive Manufacturing Working Group on Wednesday. A summary of LAMWG Concerns & Action Items, as well as copies of presentations by Kevin Slattery, Dave Abbott and Rich Rice are included as attachments to this document (see Special Presentations, page -133-). (Refer to Pages: Attach C1-7)

No Item No. **Trademark Identification. (GCC)** J. Jackson reviewed this item on Thursday regarding recognition of trademark names as shown in the handout. This item will be continued with the changes indicated below.

Action: - Continued
 - Remove "Inconel" from list and section headings
 - Add a column in the "Registered Trademark Acknowledgements" with "Specification Composition Number (UNS number)"

No Item No. **Review of Currency of Existing Database on Legacy Alloys. (SWG & MTG)** The proposal included in the agenda package on this item was reviewed by R. Rice at the MTG meeting. Members of the Airframer Steering Group (ASG) and all of the participating aluminum suppliers supported the proposal.

Action: - Continued
 - Collect certification strength data less than 5 years old on 2024-T351 plate (bare and clad), 2124-T851 plate, 7050-T7451 plate, 7075-T7351 plate, 7075-T7651 extruded rod, bar, and shapes, 7475-T7351 plate and Ti-6Al-4V annealed bar
 - Where available, collect associated fatigue, crack growth, and fracture toughness data

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- Submit all these data in electronic form to J. Jackson or R. Rice at Battelle by July 1, 2003
- Prepare material-specific (static strength) agenda items when sufficient data are collected to meet current guideline requirements

CHAPTER 2. STEEL ALLOYS

Item 03-04 **Review of Shear Ultimate Strength Data Integrity for Steel Alloys in MMPDS. (MTG)** J. Jackson led discussion on this item. In a letter dated January 14, 2003 Carl Rousseau, Lockheed, requested that the shear ratios be re-evaluated for various steel and titanium alloys. The existing databases and analyses supporting the shear ratios published in the Handbook for 15-5PH stainless steel bar and forgings, and AISI 301 annealed and full hard sheet were reviewed and found to meet current guideline requirements. Therefore, it was proposed that no changes be made to these shear values.

- Action:
- Proposal to make no changes in 15-5PH and 301 SS shear values was accepted. Item assigned number 03-04 and closed.
 - Proposed correction to footnote “d” in Table 2.3.1.0(h₂) was approved.

CHAPTER 3. ALUMINUM ALLOYS

Item 00-10 **Reference for Weldability of Aluminum in Section 3.1.3.4. (MTG)**
J. Jackson led discussion of a proposal to modify Table 3.1.3.4 using the lowest rating when there was a discrepancy between the ratings shown by the Aluminum Association and ASM.
(Refer to Pages: Attach C3-1 through C3-4)

- Action:
- Approved and closed. Include in CN-A.

Item 01-08 **Update Test Methods for Plane-Stress Fracture Toughness Data. (MTG)**
R. Rice reported that the primary near-term effort would continued to be focused on support of the update to ASTM E561, which is currently being coordinated through ASTM E08.

- Action:
- Continued

Item 01-11 **A- and B-Basis Properties for 7250-T7451 Aluminum Alloy Plate. (MTG)** J. Jackson provided a status report on this item. Pechiney has decided not to pursue this alloy thus efforts on the draft AMS specification have been halted at SAE.

- Action:
- Work discontinued. Item closed.

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- Item 01-16 **A- and B-Basis Tensile Properties for 7249-T76511 Aluminum Alloy Wide Extrusions. (MTG)** J. Jackson provided a status report on this item. The AMS specification has been re-submitted to SAE to be sent to ASC. Needed LT shear and bearing data have been generated and submitted to Battelle.
- Action: - Item continued for publication of AMS specification and analysis of LT shear and bearing data.
- Item 02-02 **Reduced Beryllium Replacement for D357-T6. (MTG)** J. Jackson reviewed the proposal to have the correct new table, Table 3.9.7.0(c), for E357 be included in the first revision of the MMPDS.
(Refer to Page: Attach C3-5 through C3-6)
- Action: - Approved and closed. Include in CN-A.
- Item 02-03 **Reduced Beryllium Replacement for A357-T6. (MTG)** J. Jackson presented this data proposal.
(Refer to Page: Attach C3-7 through C3-8)
- Action: - Approved and closed. Include in CN-A.
- Item 02-14 **Design Minimum Properties for 7150-T77511 Extruded Wide Panels. (MTG)** J. Jackson indicated that this item was approved at the 1st MMPDS and the 101st MIL-5 meeting pending AMS 4325 specification approval. She proposed that the section be included in the next revision of MMPDS.
(Refer to Page: Attach C3-9 through C3-10)
- Action: - AMS 4325 was published January 22, 2003
 - Item approved and closed. Include in CN-A.
- No Item No. **Stress Strain Curves for 7055-T76511 Aluminum Extrusions. (MTG)**
Stress strain curves will be prepared for the 4th MMPDS meeting.
- Action: - Continued. Data to be supplied
- Item 03-12 **A- and B-Basis Properties for 7055-T76511 Aluminum Extrusions. (MTG)**
J. Jackson presented this agenda item, which addressed extrusions from 0.500 to 3.000 inches thick. This item was presented as a handout in the 2nd MMPDS and 102nd MIL-5 meeting and repeated in the agenda for this meeting. Revision A of AMS 4336 has been approved by SAE/AMS but still must be sent to ASC and be published before this item is approved.
- Action: - Approved and assigned item number 03-12.
 - Waiting on publication of AMS 4336 revision A, prior to inclusion in the next revision of MMPDS.

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Item 03-05 **Stress Strain Curves for 2297-T87 Plate. (MTG)** J. Jackson reviewed the proposal to add typical and full-range curves as Figures 3.2.9.0.6(a) and (b). The existing cyclic stress strain curve will be relettered Figure 3.2.9.0.6(c)
(Refer to Pages: Attach C3-11 and C3-12)

Action: - Item approved, assigned number 03-05, and closed.
 - Include in CN-A.

No Item No **Compression Properties for 2297-T87 Plate. (MTG)** J. Jackson gave a status report. J. Jackson will review submitted compression data and contact Pechiney if additional data or information is needed.

Action: - Continued.

No Item No. **A- and B-Basis Properties for 6061-T6. (MTG)** J, Jackson indicated this material is produced under AMS-WW-700/6 and AMS-T-7081. S. Fantle, Boeing has requested data from Pechiney and Alcoa. Results of data analyses will be presented in the 4th MMPDS Coordination Meeting Agenda.

Action: - Continued.

Item 03-06 **Addition of S-Basis Minimum Properties for 7075-T76 and 7075-T7651x Extruded Rod, Bar, and Shapes for 1.00- to 4.00-Inch Thickness Range. (MTG)** R. Rice led the discussion on the proposal to modify Table 3.7.6.0(g₃) to incorporate the S-basis minimum properties for this product in the 1.000 to 4.000 inch thickness ranges. He proposed that certification data be collected from the current major suppliers of this product in thicknesses ranging from 1.000 to 4.000 inches so that A- and B-basis allowables can be incorporated into the Handbook. While doing this he also proposed that data be collected for extrusions in the 0.250 to 0.499 inch thickness range.
(Refer to Page: Attach C3-13)

Action: - Assigned number 03-06, approved and closed.
 - A request was made for data in the 0.250-0.499 inches and 1.00-4.00 inch thickness ranges to determine A- and B-basis minimums.

CHAPTER 4. MAGNESIUM ALLOYS

No Chapter 4 agenda items or handouts were discussed.

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CHAPTER 5. TITANIUM ALLOYS

Item 99-11 **A- and B-Basis Design Mechanical Properties for Ti-6-4 Castings. (MTG)** J. Jackson (static properties) and R. Rice (fatigue, crack growth, fracture toughness properties) presented the agenda item. This item was approved with corrections and was included in finalized form in the minutes of the 2nd MMPDS and 102nd MIL-5 meeting, however the item could not be closed until the draft AMS specification was published. AMS 4992 was published October, 2002. It was proposed that the section be included in MMPDS-01, CN-A.
(Refer to Pages: Attach C5-1 through C5-11)

Action: - Approved and closed.

No Item No. **Expansion of Plane Strain Fracture Toughness Properties Included in Table 5.1.2.1.1 of MMPDS. (MTG)** R. Rice led the discussion presented in a handout on Ti-6-4 ELI and beta annealed, die and hand forgings. No immediate action planned under current scope of work.

Action: - Continued.

No Item No. **Update Figure 5.4.1.2.7 for Ti-6Al-4V to Comply with Current Creep Property Guidelines. (MTG)** R. Rice led the discussion on this handout item. He proposed that the creep nomograph currently in the Handbook for Ti-6Al-4V STA sheet be updated or deleted. Virtually all meeting participants suggested that it be deleted. Formal approval of the item was deferred until the next meeting because it was a handout.

Action: - Proposal to remove figure will be presented in the next agenda.

No Item No. **Mechanical Properties for Ti-6Al-4V Plate Produced by Electron Beam Melt. (MTG)** J. Jackson led the discussion on this controversial agenda item. A series of action items were identified to move this item forward for the next meeting.

Action: - Continued
 - Attempt to compare EB melt with VAR melt properties (check to see if Battelle has VAR data and request current VAR data)
 - Track oxygen content of data (may need to normalize by oxygen content.
 - Consider presentation of properties by chemistry.
 - Request made that fatigue and crack growth data be developed.

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Item 03-07 **Review of Shear Ultimate Strength Data Integrity for Titanium Alloys in MMPDS. (MTG)** J. Jackson led the discussion on this item. She indicated that Carl Rousseau, Lockheed, had requested that the shear ratios be re-evaluated for Ti-6Al-4V sheet. Based on a review of existing data and analyses a proposal was made to retain existing properties for this alloy.

Action: - Proposed no change.
 - Approved, assigned number 03-07, and closed.

No Item No. **Consideration of Inclusion of Design Minimum Strength Properties in MMPDS for LAM Ti-6Al-4V Produced in Accordance with AMS 4999. (MTG)** This item was discussed in the LAMWG.

Action: - Continued. See action items identified under LAM Working Group.

CHAPTER 6. HEAT RESISTANT ALLOYS

Item 03-08 **Reevaluation of Stress Rupture Analysis Displayed in Figures 6.3.10.1.7(a) and (b) of MMPDS-01. (MTG)** R. Rice reviewed this handout item. He proposed addition of the within-heat variance to the correlative information. There was no controversy on this proposal, but formal approval of the item was deferred until the next meeting because it was a handout.

Action: - Assigned number 03-08.
 - Present in next agenda for approval.

Item 03-09 **Update Figure 6.3.7.1.7 for Rene 41 to Comply with Current Creep Property Guidelines. (MTG)** R. Rice proposed that the creep nomograph currently in the Handbook for Rene 41 be updated or deleted. Virtually all meeting participants suggested that it be deleted. Formal approval of the item was deferred until the 4th MMPDS meeting because it was a handout.

Action: - Assigned number 03-09
 - Present proposal in next agenda to delete figure.

Item 03-10 **Update Figure 6.4.1.1.7 for L-605 to Comply with Current Creep Property Guidelines. (MTG)** R. Rice proposed that the creep nomograph currently in the Handbook for L-605 be updated or deleted. Virtually all meeting participants suggested that it be deleted. Formal approval of the item was deferred until the 4th MMPDS meeting because it was a handout.

Action: - Assigned number 03-10.
 - Present proposal in next agenda for removal.

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Item 03-11 **Review of Shear Ultimate Strength Data Integrity for A-286 Alloy in MMPDS. (MTG)** J. Jackson reported that the sample sizes used to compute the presently displayed shear values in Table 6.2.1.0(b) do not meet current guidelines. Therefore, she proposed that they be removed from the table. She also proposed that all other derived property design data be removed from the table for the same reason.
(Refer to Page: Attach C6-1)

- Action:
- Assigned number 03-11.
 - Approved to remove all derived properties and retain S-basis tensile properties.
 - Item closed

CHAPTER 7. MISCELLANEOUS ALLOYS AND HYBRID MATERIALS

No Chapter 7 agenda items or handouts were discussed.

CHAPTER 8. STRUCTURAL JOINTS

No Item No. **Fastener Task Group. (FTG)** N. Ontko, AFRL/MLSC led the FTG meeting, which was held on Wednesday. The FTG meeting was a closed session from 10:15am until 12:00 noon. FIWG members met on their own during the FTG closed session, as noted below.
(Refer to Pages: Attach - C8-1 through C8-22 for FTG presentation material.)

No Item No. **Ultimate Load Definitions. (FTG)** Modifications to the figures accept as proposed. Common verbiage referring to 'Joints' and 'Coupons' agreed to by FTG/FIWG. The word "Load" will be removed from the footnotes. FTG will review pertinent Chap. 8 and Chap. 9 paragraphs to incorporate common verbiage. Request No Item No. to recognize this activity.

- Action:
- Continued.

Item 03-13 **References to MIL-R-7885. (FTG)** Joint allowable Tables 8.1.3.2.2®, 8.1.3.2.2(s) and 8.1.3.2.2(t₁) contain fastener shear strength footnotes referencing MIL-R-7885D, which has been cancelled. The FTG proposes to modify fastener shear strength Table 8.1.1 to incorporate $F_{su}=50$ ksi categories for 5056/A-286 and 5056/Alloy steel material combinations as a shear strength reference for blind rivets. The affected table footnotes will be modified to refer to Table 8.1.1 as the shear strength reference for the fastener system. There was general agreement on this course of action.

- Action:
- Assigned number 03-13
 - Present in next agenda for approval

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No Item No. **Updated Fastener Failure Mode Drawings. (FTG)** The FTG requested that Battelle retrieve updated fastener failure mode sketches that had been created several meetings ago, but not incorporated into the handbook pending definition of the sunset clause. The referenced figures are attached for re-introduction and review.

(Refer to Pages: Attach C8-23 through C8-27)

No Item No. **Fastener Industry Working Group. (FIWG)** The FIWG met with the FTG on Wednesday, with the exception of the closed FTG session noted above. The FIWG met separately during the closed FTG session, when they independently discussed current and proposed new Chapter 8 items. The FIWG and FTG also met concurrently at the close of the day to resolve outstanding issues and identify key FTG and FIWG action items for the next 6 months.

- FIWG to review pedigree of Chap 8 original suppliers of data; identifying current manufacturer(s) associated with a given table.
- FIWG proposed cancellation of itself as a separate task group, requesting that fastener suppliers be allowed membership on FTG. Proposal to be reviewed by FTG, and formal response to request presented at 4th MMPDS coordination meeting.

No Item No. **Clarification of Note Usage in Table 8.1.2.1(c). (FTG)** R. Goode reviewed the proposal to remove the note “Because of difficulties encountered upsetting countersunk head rivets in thin A-286 sheet, such conditions should be avoided in design.” It was decided that additional research into the origin of this wording was needed.

Action: - Continued.

No Item No. **Possible Removal of Footnote in Table 8.1.3.1.2(n). (FTG)** R. Rice proposed that footnote d of Table 8.1.3.1.2(n) be modified as follows: “Calculated yield reduced to match ultimate strength.” The FTG did not approve this proposal. In other words, the form of this footnote remained unchanged.

Action: - FTG to review remainder of Chap 8 tables for applicability.
Continued.

No Item No. **Collection and Analysis of New Fastener Data to Refine and Validate New Fastener Analysis Guidelines. (FTG)** R. Rice proposed this new item to help refine and validate the new fastener statistical analysis procedures.

Action: - Continued.

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No Item No. **Incorporation and Implementation of a Sunset Clause for Mechanical Fasteners in MMPDS. (FTG)** R. Goode and N. Ontko led the discussion on this important item. Further details on this and other key fastener items will be distributed with the FTG minutes.
(Refer to Pages: Attach C8-29 through C8-30.)

- Action:
- Sunset Clause introduced to FTG members. Goal is to prepare a final draft suitable for a formal agenda item request at the 4th MMPDS meeting.
 - FTG members will review Chap. 8 table usage to prioritize the batting order of Sunset Clause.
 - Draft text of Sunset Clause attached.
 - Continued

CHAPTER 9. GUIDELINES FOR THE PRESENTATION OF DATA

Item 94-26 **Production Methods and Their Impact on Design Allowables. (GTG)** R. Rice led the discussion on the enclosed agenda item. Since there was continued debate on this item, a decision was made to take a vote to resolve this long-standing item.
(Refer to Pages: Attach C9-1 through C9-3)

- Action:
- Item approved as proposed.
 - Create new item coordinated by J. Pillers, Boeing, on Incorporation of Statistical Process Control Guidelines in MMPDS to be submitted to Battelle by August 1st.

Item 98-3 **Procedure for Analyzing Lower Tail Censoring. (SWG)** R. Rice presented a status report. He offered to prepare a guideline proposal on this issue for review at the 4th MMPDS meeting.

- Action:
- Continued

Item 01-01 **Regression for Skewed Data. (SWG)** R. Rice led discussion of this handout item. He offered to prepare a guideline proposal on this issue for review at the 4th MMPDS meeting.

- Action:
- Continued

Item 01-02 **Proposal to Change Backoff Limit to Percentage of Standard Deviation in the Sequential Weibull and Sequential Pearson Procedures. (SWG)** R. Rice led discussion of this agenda item.

- Action:
- Continued

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- Send a draft guideline proposal by early July to the following
S. Fantle, Boeing
J.T. Amin, Lockheed
P. Brouwer, Alcoa
M. Shiao, FAA
M. Niedzinski, Pechiney
- Proposal to be prepared for the 4th MMPDS meeting.

Item 01-04 **Reevaluation of Statistical Procedures for Calculations of S-Basis Design Values. (SWG)** R. Rice reviewed a proposed modification to the Pearson T₉₉ calculation procedure for small sample sizes to avoid the possibility of overly conservative S-basis values.
(Refer to Pages: Attach C9-5 through C9-8)

- Action:
- Continued
 - Committee members should review this handout with their statisticians and respond to R. Rice.

Item 01-05 **Revise Section 9.1.6.8 in Coordination with SAE/AMS. (GTG)** J. Jackson indicated that AMS adoption of proposed new procedure for calculation of S-basis minimum values must await approval of Item 01-04.

- Action:
- Continued

No Item No. **Define Lower Bound Properties for Elongation. (SWG)** R. Rice indicated plans to drop the item unless a specific action item regarding this issue could be defined.

- Action:
- Continued
 - Requested that Jay Goodman, Alcoa, will give some direction on this item.

Item 03-01 **Determination of A- and B-Basis Allowables for Cases Where the Calculated T₉₉ Value is Greater Than the Specification Minimum Value. (GTG)** R. Rice and S. Fantle presented a handout on this item. It was proposed that the current practice of publishing the lower of the S-basis and T₉₉ value as the A-basis value be reevaluated. It was agreed that much of the problem could be resolved if overly conservative S-basis values could be corrected in the applicable specification. R. Steffen, Raytheon, offered to help address this side of the problem. Because of the potentially significant impact of this item on the Handbook a decision was made to continue discussion on it at least until the 4th MMPDS coordination meeting.
(Refer to Pages: Attach C9-9 through C9-17 for this presentation.)

- Action:
- Assign number 03-01 and continue.

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No Item No. **Analysis and Presentation of Fatigue Crack Growth Data. (SWG)**
R. Rice requested, if and when significant analytical work is reinitiated on fatigue crack growth rate data analysis and presentation for MMPDS, that an ad hoc working group be set up within the GTG that would be responsible for upgrading the MMPDS guidelines for fatigue crack growth, setting-up an ongoing liaison between this ad hoc group and ASTM Committee E08 to promote technology transfer, and the development of a database of substantial crack growth rate data collections that can be used by various analysts to evaluate candidate crack growth analysis procedures.

Action: - Reassess proposal when funding allows.

No Item No. **Modification of Guidelines Regarding Electronic Submission of Certification Data for Definition or Verification of Design Allowables. (GTG)** R. Rice led the discussion on this new item. J. Pillers, Boeing, helped explain the issue and its importance to the aerospace industry. Widespread interest was expressed, so a decision was made to set up a working group led by J. Pillers.

Action: - Item continued. J. Pillers, Boeing, will lead a working group comprised of:

- Iulian Gheorge, Universal Alloy
- Mike Mitchell, NASA Marshall
- Curtis Davies, FAA
- Lori Flansburg, Lockheed
- Mat Crill, Lockheed
- Steve Fantle, Boeing
- Pete Brouwer, Alcoa
- Will Marsden, Granta Design
- Brian Sova, Boeing

Item 03-02 **Update and Addition of Example Problems in Chapter 9 Guidelines. (GTG)**
R. Rice indicated that there are 20 example problems included in Chapter 9. He proposed that four of them be updated. He also proposed that a variety of other example problems be added to the Chapter 9 guidelines over the next few years.

Action: - Assigned number 03-02 and continued
 - The first 3 example problems were identified as follows:

- A- and B-basis regression
- Fastener ultimate and yield load
- Calculation of elevated temperature design allowables from effect of temperature curves.

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Item 03-03 **Calculation of Indirect Minimums for Titanium. (GTG)** J. Jackson presented the enclosed agenda item. There was a discussion on why no primary direction was given for titanium. It is assumed that the reason is that AMS specifications do not call out a test orientation. Further investigation will be conducted to determine why a primary or test direction is not called out in AMS specifications and what orientation is primarily used by producers.

- Action:
- Assigned number 03-03 and continued.
 - Accept paragraph wording and fix footnote c 2nd sentence wording and present at next meeting.

SPECIAL PRESENTATIONS

No Item No. **Special Presentation. (ISG & GCC)** J. Bakuckas, FAA Technical Center, gave a presentation during the open session of the ISG on the MMPDS Management Plan. An abbreviated version of this presentation was also given on Thursday morning during the GCC.
(Refer to Pages: SP -1- through SP -17- for a copy of the presentation)

- Action: ISG to develop a draft commercialization plan due 30 days before the 4th MMPDS coordination meeting.

No Item No. **Special Presentation. (ISG & GTG)** A. Quilter, ESDU, gave a special presentation on Monday afternoon during the open session of the ISG on Overview of The Metallic Materials Data Handbook (ESDU 932). A discussion was also led by A. Quilter and R. Rice on Tuesday afternoon in the GTG on whether there is a need for resolution of any of the differences in the guidelines of MMPDS and ESDU 932.
(Refer to Pages: SP -19- through SP -24-)

No Item No. **Special Presentation. (ISG)** R. Steffen, Raytheon, gave a special presentation on Monday afternoon during the open session of the ISG on the AMS Metals Group and their handling of new and revised material specifications.
(Refer to Pages: SP -25- through SP -53-)

- Action:
- Editorial Consultants and SAE staff will provide top priority to New Specs (rather than non-essential revisions of existing specs) when working their assignments to prepare 14 Day Affirmations and Aerospace Council documents.
 - Committee Secretaries will begin to retain ALL documents on their committee's agenda (and minutes) until publication.
 - SAE (Kerri) will maintain a manual status tracking log for every New Spec.
 - SAE will investigate the possibility of sharing their TIMS specification tracking system status with members/sponsors to

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provide instantaneous access to document status. Responsibility for this action is Bob Steffen and Kerri Tielsch.

- Sponsor concerns/problems with the AMS Specification process should be voiced to Kerri Tielsch at SAE ([ktielsch@sae.org](mailto:ktiensch@sae.org)) with a copy to Bob Steffen, Metals Group Chair (r-steffen@raytheon.com).

No Item No. **Special Presentation. (GCC)** C. Davies, FAA Technical Center, made a special presentation on Tuesday on MIL-HDBK-17 statistical analysis procedures.
(Refer to Pages: SP -55- through SP -62-)

No Item No. **Special Presentation. (MTG)** P. Lequeu, Pechiney, gave a special presentation on Wednesday morning in the MTG on New Alloys, Tempers, and Product Forms of Interest to the European Aircraft and Aerospace Community.
(Refer to Pages: SP -63- through SP -100-)

No Item No. **Special Presentation. (LAMWG)** R. Rice gave a special presentation on Statistical Analysis of LAM Ti-6Al-4V Static Strength Properties. K. Slattery, Boeing, and D. Abbott, Aeromet, also gave technical presentations on recent efforts to develop design allowable properties for LAM material.
(Refer to Pages: SP -101- through SP -136- for a copy of these presentations)

No Item No. **Special Presentation. (GCC)** R. Yarges, FAA Transport Airplane Directorate (TAD), gave an update on the current 25.613 rulemaking activity, which addressed revised requirements for material strength properties and design values for transport airplanes.
(Refer to Pages: SP -137- through SP -148- for a copy of the presentation)

No Item No. **Special Presentation. (GCC)** C. Davies, FAA Technical Center, made a special presentation on Thursday on the MIL-HDBK-17 organization and current activities. During the discussion possible future collaborations with MMPDS in mutual needs areas were discussed.
(Refer to Pages: SP -149- through SP -189-)