



Minutes of the 37th MMPDS Coordination Meeting

Held in:

Virtual Meeting
March 22nd - 26th, 2021

Compiled by:

Battelle
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Prepared for:

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37th MMPDS Coordination Meeting

Introduction of Attendees

A list of 37th Coordination Meeting attendees, indicating the virtual meetings they attended, has been incorporated into this document.

Chairman's Remarks – Mark James, FAA

I want to thank everyone who participated in the 37th MMPDS General Coordination Committee meetings held virtually between March 22nd through March 26th. The COVID-19 virus continues to be a great challenge that will impact the aerospace industry for some time to come. The Battelle team did an excellent job of organizing and coordinating the WebEx sessions to keep the program moving forward. The final Minutes become official 30 days after posting unless comments are sent to Battelle as described in the Foreword to MMPDS-15.

Every meeting approves significant Agenda Items. Of particular note for the 37th meeting are Items 19-20, 20-20, 20-31, and 21-11. These items provide critical elements of the framework for data generation and analysis for additively manufactured metal alloys. There is still a great deal of work to do before material allowables entries can be approved but these items are significant progress towards that objective.

As of this writing, Battelle and the FAA expect that the 38th Meeting will take place in Denver, Colorado the week of August 30, 2021. Travel restrictions may require special accommodations, especially for members from outside the US. Battelle is continuing to monitor federal, state, and local developments and will work with the GSG to decide upon the final format (face-to-face, virtual, hybrid.)

As discussed during the 37th GCC, there may be some virtual sessions in August to introduce complicated items, gather feedback from a wider audience, and provide an opportunity to discuss Consent Agenda items. The success of every meeting depends on your continuing participation.

Thanks again for attending the 37th MMPDS Coordination meetings. Your commitment, dedication, and donation of your valuable time to maintain MMPDS is most appreciated. I look forward to seeing everyone in Denver.

Best Regards,
Chairman, Mark James

Mark James
Manager, Dynamic Systems (Acting) AIR-627
Technical Policy and Innovation Branch

Approval of the 37th MMPDS Meeting Minutes

If no objections or corrections have been received by Battelle within 30 days after release of meeting minutes or 30 days after a technical change, the minutes of the 37th Meeting are considered approved.



SUMMARIES

37th MMPDS Meeting Attendance			March 22nd	March 22nd	March 22nd	March 23rd	March 24th	March 25th	March 26th	March 26th
Last Name	First Name	Company	Orientation	ISG	ISG/GSG	FTG 1-3	ETTG 1-3 and A-2	GTG 1-3 and A-3	MTG 1-3	GCC
Anderegg	David	Defense Logistics Agency			x	x	x	x	x	x
Anderson	Neil	Boeing		x	x	x	x	x	x	
Andrulonis	Rachael	NIAR					x			
Arumugam	Sak	ANSYS Granta							x	x
Avunduk	Oyku Nil	Tusas Engine Industries	x	x				x		
Bach	Andreas	Aleris Rolled Products	x	x	x			x	x	
Bakuckas	John	Federal Aviation Administration	x		x		x	x	x	x
Barber	Lee	Raytheon					x			
Barnes	Devin	Lockheed Martin		x			x	x	x	x
Baxendale	Jonathan	GKN Aerospace	x			x	x			
Beckman	Jonathan	Gulfstream					x	x	x	
Bennett	Jay	NASA	x		x	x	x	x	x	x
Bennett	Russell	Boeing		x	x			x	x	x
Benson	Callie	Collins Aerospace	x	x	x		x	x	x	x
Bittner	Peter	Constellium		x	x		x	x	x	x
Bourges	Laurent	Lisi Aerospace				x				
Braid	Neil	Gulfstream	x							
Bray	Gary	Westmoreland		x	x		x	x	x	x
Cartlidge	Jon	Battelle Memorial Institute	x							
Choudhury	Fatima	Pratt Whitney		x	x		x			
Cordner	Sam	NASA	x		x		x	x	x	x
Crill	Matthew	Boeing	x	x	x		x	x	x	x
Crisler (Frink)	Elizabeth	Textron Aviation		x		x	x	x	x	x
Daley	Nancy	Rocketdyne					x	x	x	x
Dangerfield	Victor	Universal Alloy	x	x			x	x	x	
Davies	Curtis	Federal Aviation Administration	x			x	x	x	x	
Davis	Robert	ANSYS Granta		x						
Dinler	Ali Firat	Tusas Engine Industries		x	x					
Elwell	Abram	Boeing		x	x			x	x	x
Esparragoza	Manuel	Questek		x	x		x	x	x	x
Evans	Ben	UTAS		x				x	x	
Firdosy	Samad	NASA					x			
Garcia-Avila	Matias	ATI Metals		x	x		x	x	x	x
Gibbons	Duncan	Students - Stellenbosch University	x		x		x	x	x	x
Godfrey	Donald	SLM Solutions				x	x	x		
Goetschius	Susan	Pratt Whitney						x		
Gonzalez	Alex	Colorado School of Mines					x			
Goode	Randy	Lockheed Martin				x	x	x	x	
Goodman	Jay	Blue Origin	x	x	x		x	x	x	x
Gorelik	Michael	Federal Aviation Administration			x	x	x	x		x
Grant	Robert	Federal Aviation Administration			x		x			
Grohoske	Travis	Velo3D	x	x	x	x	x	x	x	x
Guerrier	Paul	Moog Inc.		x	x		x	x		
Guo	Guangping	Beijing Institute for Aeronautical Materials	x	x	x		x	x	x	x
Gurrola	Robert	Howmet		x	x	x		x		
Hahn	Michael	Northrop Grumman		x	x		x	x	x	x
Hall	Doug	Battelle Memorial Institute	x	x	x	x	x	x	x	x
Hall	Gary	Bell Helicopter		x	x	x	x	x		
Hasting	Will	Velo3D	x	x	x	x	x	x	x	x
Heine	Christoph	Airbus	x	x	x	x	x	x	x	x
Hernandez-Otero	Edwin	Boeing		x	x		x	x	x	x
Hess	Ethan	US Navy					x			
Iten	Jeremy	Elementum 3D					x			
James	Mark	Federal Aviation Administration			x	x	x	x		
Johnson	Dwight	Textron Aviation	x			x	x	x		
Kane	Michael	U.S. Army			x					
Kasami	Akiko	MHI		x			x	x	x	
Ketkar	Chintamani	Textron Aviation	x	x	x		x	x	x	

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Last Name	First Name	Company	Orientation	ISG	ISG/GSG	FTG 1-3	ETTG 1-3 and A-2	GTG 1-3 and A-3	MTG 1-3	GCC
Kim	Don	GKN Aerospace					X			
Klenosky	Daniel	Spirit Aerosystems	X	X			X		X	
Klepsch	Linda	WIAM Gmbh	X	X		X	X	X	X	X
Kowalik	Daniel	EWI					X			
Krile	Bob	Battelle Memorial Institute		X		X	X	X		
Kusner	Robert	Materion	X	X	X		X	X	X	X
Lamas	Jose	Embraer		X	X	X				
Le	Peter	Northrop Grumman			X	X				
Leicht	Doug	Parker LORD				X		X		
Lelos	Vasileios	Gulfstream						X		
Malik	Kundan	Collins Aerospace		X		X				
Maciejewski	Kimberly	Arconic	X	X	X			X	X	X
McGill	Matthew	Parker LORD	X	X						
Moulton	Allison	Parker LORD					X	X	X	
Nagao	Kazuki	Honda R&D Americas, Inc.	X	X	X		X			
Niedzinski	Michael	Constellium			X		X		X	X
Norimatsu	Koichi	IHI Corporation						X		
Ofsthun	Mark	Honda Aircraft Company	X	X	X	X		X	X	
Ohm	Andrew	Battelle Memorial Institute		X	X					
Olsen	Kirk	Parker LORD	X	X	X	X	X	X	X	X
Oparka	Stephen	US Navy	X				X			
Oshino	Hironobu	IHI Corporation	X	X	X					
Özkaya	Furkan	Tusas Engine Industries		X	X	X		X		
Piché	Marie	Bombardier Aviation			X	X	X		X	X
Pujar	Vijay	Collins Aerospace		X	X		X			
Rainey	Kelsey	GE Additive					X			
Raposo	Humberto	CarTech	X			X	X	X	X	X
Reakes	Clay	Battelle Memorial Institute	X	X	X	X	X	X	X	X
Reber	Korey	Collins Aerospace	X	X	X		X	X		
Reeves	Daniel	Blue Origin					X			
Rice	Tony	Battelle Memorial Institute		X	X					
Ricks	Brian	Raytheon		X			X			
Robertson	Jessica	Haynes International	X	X	X		X	X	X	X
Rubadue	Jana	Battelle Memorial Institute	X	X	X	X	X	X	X	X
Sabo	Ken	Lockheed Martin						X		
Scalf	Cyndee	Battelle Memorial Institute	X	X	X	X	X	X	X	X
Scheuring	Jason	Kaiser Aluminum		X	X		X	X	X	X
Shahani	Ravi	Constellium					X			
Shannon	Carinne	Battelle Memorial Institute	X	X	X	X	X	X	X	X
Shivers	Brian	US Air Force				X				
Shula	Brian	Honeywell								X
Sippel	Walter	Federal Aviation Administration			X		X	X		
Sodouri	Pedrum	Norsk Titanium	X	X	X		X			
Spiegelberg	Bill	Materion	X			X	X	X	X	X
Steele	Leslie	Collins Aerospace			X		X	X	X	X
Steevens	Andrew	Boeing		X	X		X	X	X	X
Steinberg	Jacob	Raytheon	X	X	X		X			
Stonaker	Kevin	Federal Aviation Administration			X		X	X	X	X
Sutton	Adam	Lockheed Martin		X	X	X	X	X	X	
Takahashi	Kotomi	IHI Corporation					X			
Thomas	Bruce	Bombardier Aviation		X	X	X	X	X	X	X
Thompson	Steve	US Air Force			X	X		X	X	X
Toivonen	Paul	Spirit Aerosystems					X			
Vanderpol	Paul	Collins Aerospace	X	X	X	X	X	X	X	X
Vetland	Emma	GKN Aerospace					X			
Vico	Federica	Norsk Titanium	X	X	X		X			
Vogel	Bret	Textron Aviation		X	X		X	X	X	X
Walker	James	Parker LORD				X	X			

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Wang	Jasmine	Parker LORD	x	x		x				
Watkins	Sarah	Pratt Whitney							x	
Wells	Douglas	NASA					x	x		
Wheelock	Paul	Rolls-Royce	x	x	x		x	x	x	x
White	Will	Battelle Memorial Institute				x		x		
Yondu	Numan Berat	Tusas Engine Industries		x	x	x		x	x	
Young	Bruce	Battelle Memorial Institute						x	x	x

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New Item Numbers Assigned in 2021

21-01	Foreword to Volume II
21-02	Section 9.5 & 9.6 for Volume II
21-03	Ti-6Al-4V Die Forging Upgrade to A- and B-Basis Properties
21-04	Section 9.2.3 - Required Test Methods/Procedures for Volume II
21-05	Revision of AMS4534 C17200 Copper Beryllium Rod
21-06	2050-T852 Die Forging Shear Direction Correction
21-07	7055-T76511 Aluminum Alloy Extrusion Increase in Cross-Sectional Area and Circle Size
21-08	Short Transverse Shear Properties for 7050-T7451 Aluminum Alloy Plate Direction
21-09	Equation 9.7.1.4(h)
21-10	Fatigue of PH13-8 Bolts
21-11	Interim Data Analysis Methods: Volume II
21-12	Clarification of Combinability
21-13	Review of Section 5.5.3 Ti-10V-2Fe-3Al Comments and Properties
21-14	Review of Section 2.1.2 Material Properties
21-15	Review of Section 1.4.3.3 Strain Rate
21-16	Acceptance of Column Reduction Method in Section 1.6.4
21-17	Elongation Measurement
21-18	Updates from V2WG Sub-teams
21-19	Chapter 9 Changes Supporting Inclusion of New Fracture Toughness Data from Item 14-62
21-20	Microstructural Submittal Requirements
21-21	Update Table 8.1.3.2.2(k) to Correct Item 16-36 Error
21-22	Update Figures 3.7.10.1.8(e)-(h) to Correct Legend Title from Stress Ratio to Mean Stress

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New Item Numbers Assigned in 2021

21-23 Definitions of "Design Allowable", "Design Value", and "Material Allowables" for MMPDS

21-24 Update Figure 5.4.1.1.8(a) (Ti-6Al-4V annealed bar) to include Seq Equation

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CLOSED AGENDA ITEMS

Item No	Responsible Group		Chpt	Title	Type	WebEx Session	37th Action	37th Meeting Description
	Final	Initial						
14-19	GTG		9	Inclusion of KIsi Fracture Toughness Data	Status	GTG-1	Closed w no Action	C. Reakes noted that KIsi was added to ASTM E399. Since it is part of ASTM E399, this will be discussed in Item 14-62.
15-40	GTG	ASG, MATSSG	9	Guidelines for When Specimens Are Not From Full Thickness	Agenda	GTG-2	Approved w Changes and Closed	J. Rubadue presented this item. Revise the blue sentence of proposal to "...center, D/2, t/2, t/4,".
17-29	GTG-F	FTG	9	Replacement of T90 Yield Curve with a Multiple-Regression Typical Yield Curve for Joint Allowables	Agenda	FTG-2	Approved and Closed	W. White presented this item.
17-32	FTG		8	Edit Table 8.1.5.1	Agenda	FTG-1	Approved and Closed	C. Reakes presented this item to show a correction to Table 8.1.5.1.
19-04	GTG	ETTG	V2	Considerations for Certifying an AM Part	Status	ETTG-3	Closed w no Action	Will track this effort in Item 21-18.
19-20	GTG	ETTG	V2	Data Requirements for Volume II	Agenda	ETTG-2, GTG-3	Approved w Changes and Closed	D. Hall presented this item. Compression should be changed to 20 samples, 3 heats, 10 lots since it can use indirect analysis. Bearing and shear are currently S-basis only until methods revised in MMPDS. Add footnote for shear and bearing requirement for C/D-Basis. Discussion on inclusion of recycled vs virgin powder. There were disagreements on if more should be added to this table. 3/70ish disapproved based on powder discussion. Volume II is still being developed and subject to change. Data generation may also have additional requirements from other sections of MMPDS Volume I and Volume II. Data sponsors are advised to contact MMPDS to review their testing plans.
19-21	MTG		multi	Determine Buckling Notes for Existing Figures With Dual-Shape Parameters	Agenda	MTG-2	Approved and Closed	C. Shannon presented this item. Open a new item to re-evaluate figures which did not meet the current criteria.
19-43	MTG		3	Upgrade of Design Properties of AMS 4154 for 7075-T6511 Aluminum Alloy Extrusion	Agenda	MTG-2	Approved and Closed	J. Rubadue presented this item. Insufficient data to upgrade S-Basis. Data confirmed lot release up to 3 inches. Discussions on secondary properties. One objection due inability to confirm secondary properties.
20-20	GTG	ETTG	V2	Definitions for Volume II	Agenda	ETTG-2, GTG-3	Approved w Changes and Closed	D. Hall presented this item. It was decided to remove word "design" from D-Basis definition. For C- and D-Basis, revise to "equal or exceed X-Basis material allowable with confidence...". Change "design allowables to material allowable". Volume II is still being developed and subject to change. Additional requirements may apply. Contact MMPDS for more information.

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CLOSED AGENDA ITEMS

Item No	Responsible Group		Chpt	Title	Type	WebEx Session	37th Action	37th Meeting Description
	Final	Initial						
20-31	GTG	ETTG	9, V2	Definitions of "Design Allowable", "Design Value", and "Material Allowables"	Agenda	ETTG-2, GTG-3	Approved w Changes and Closed	D. Hall presented this item. GSG requested that the definitions apply to Volume II alone. A new item will be created for MMPDS Volume 1. Change "Allowable" to "Material Allowable" (various places). The statement about Design Allowables will be removed from the definition. Revise Allowable definition to add word 'bulk', "A bulk material property...". "Value" is changed to "Design value". Current FAA, DoD, and NASA policies listed in the MMPDS Foreword apply to Design Allowables published in MMPDS-Volume I. MMPDS-Volume II currently plans to publish Material Allowables which will require further showing or additional evidence for regulatory approval
20-32	GTG		9	"Should", "Shall", "Must" decision for MMPDS program	Agenda	GCC	Approved and Closed	Approved at the GCC as a Consent Agenda Item
20-33	MTG		3	2196-T8511 Aluminum Extrusion Analysis and Upgrade	Agenda	MTG-2	Approved w Changes and Closed	Correct CYS Thickness 0.25-1.00 A-Basis to 69 ksi. Constellium is doing additional testing for shear and bearing. A new item will be opened when additional data are received.
20-37	MTG		3	Re-analysis of 7160-T7451 BUS e/D=2.0 (S-L)	Agenda	MTG-2	Approved and Closed	J. Rubadue presented this item. Constellium is working on addition of shear data. Shear data will be presented as a new item when received.
21-05	MTG		5	Revision of AMS4534 C17200 Copper Beryllium Rod	Agenda	GCC	Approved and Closed	Approved at the GCC as a Consent Agenda Item
21-06	MTG			2050-T852 Die Forging Shear Direction Correction	Agenda	GCC	Approved and Closed	Approved at the GCC as a Consent Agenda Item
21-07	MTG		3	7055-T76511 Aluminum Alloy Extrusion Increase in Cross-Sectional Area and Circle Size	Agenda	MTG-3	Approved w Changes and Closed	J. Rubadue presented this item. Correction to new cross sectional area should be >12 to 26.3.
21-08	MTG		3	Short Transverse Shear Properties for 7050-T7451 Aluminum Alloy Plate	Agenda	MTG-3	Approved and Closed	J. Rubadue presented this item.
21-09	GTG-F	FTG	9	Equation 9.7.1.4(h)	Agenda	FTG-1, GTG-1	Approved and Closed	W. White presented this typo correction to the equation at the FTG and GTG. The correction will be made in MMPDS-17.
21-11	GTG	ETTG	V2	Interim Data Analysis Methods: Volume II	Agenda	ETTG-2, GTG-3	Approved and Closed	D. Hall presented this item to use methods from MMPDS Vol I to analyze Vol II data submitted to the program. MMPDS allows the use of engineering judgment when existing guidelines do not apply. When required, Battelle will use engineering judgment and document the exceptions to current guidelines for committee review.
21-12	GTG	ETTG	9, V2	Clarification of Combinability	Agenda	ETTG-2, GTG-3	Approved and Closed	D. Hall presented this in ET TG and GTG. Battelle identified an inconsistency while preparing the minutes. No proposal for Vol II at this time. Open a new item for Vol II
21-14	MTG		2	Review of Section 2.1.2 Material Properties	Agenda	MTG-3	Approved and Closed	J. Rubadue presented this item.
21-15	GTG		1	Review of Section 1.4.3.3 Strain Rate	Agenda	GTG-3	Approved and Closed	J. Rubadue presented this item.

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CLOSED AGENDA ITEMS

Item No	Responsible Group		Chpt	Title	Type	WebEx Session	37th Action	37th Meeting Description
	Final	Initial						
21-NIN	GTG-F		9	User Testing of Secondary Properties for an Existing Table w/Expanded Thickness Range			Closed w no Action	This item was incorporated into Item 17-23.
21-21	FTG		8	Update Table 8.1.3.2.2(k) to Correct Item 16-36 Error	Handout	FTG-3	Approved and Closed	C. Reakes presented this item to show a correction to the table. The correction was made in MMPDS-16.
21-22	MTG		3	Update Figures 3.7.10.1.8(e)-(h) to Correct Legend Title from Stress Ratio to Mean Stress	Handout		Approved and Closed	Approved at the GCC as a Consent Agenda Item

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SORTED BY ITEM NUMBER

Item No	Responsible Group		Chpt	Title	Type	WebEx Session	37th Action	37th Meeting Description
	Final	Initial						
04-21	FTG		8	Fastener Tables of Sunset Review Interest	On Hold		Not Covered	This Item was not covered.
08-23	FTG		8	Sunset Review of Table 8.1.3.2.2(c), NAS1921C	On Hold		Not Covered	This Item was not covered.
09-13	FTG		8	Sunset Review of Table 8.1.3.2.3(a), MS21140	On Hold		Not Covered	This Item was not covered.
11-05	MTG		1	AMS Coordination	Status		Not Covered	Information from the recent AMS Metals Committees are included in the minutes.
11-38	FTG		8	Sunset Review of Flush Head, Mechanical Lock Spindle Blind Rivet Table 8.1.3.2.2(e) NAS 1921 M	On Hold		Not Covered	This Item was not covered.
11-43	FTG		8	Supporting Data and Basis Identification for Table 8.1.2(b)	Status	FTG-2	Continue	C. Shannon gave a status update. Data are needed. Trimass was going to look for data and identify the proper installation procedures for this fastener.
12-105	GTG-F	FTG	9	Modification to the Sunset Criteria Procedures	On Hold		Not Covered	This Item was not covered.
12-17	MTG	ASG & MATSSG	6	Footnote for Non-Ferrous Alloys Test Specimen When Not From Full Thickness	Status		Not Covered	This item was not covered.
12-50	GTG-F	FTG	9	Evaluation of new Regression and Confidence Models for Lap Joint Tests	Agenda	FTG-1	Continue	W. White presented this item with Item 17-28. A separate telecom will be held for these items.
12-89	MTG	PSG		Target Materials for Propulsion Applications	Status		Not Covered	This Item was not covered.
13-34	MTG		5	Addition of AMS 4919 Ti-6-2-4-2 Plate Properties	Status		Not Covered	This item was not covered.
13-50	GTG		9	ASTM Coordination	Status	GTG-1	Continue	D. Hall made a presentation at ASTM International Conference for Additive Manufacturing. Battelle is working with ASTM material specs similar to AMS.

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14-19	GTG		9	Inclusion of KIsi Fracture Toughness Data	Status	GTG-1	Closed w no Action	C. Reakes noted that KIsi was added to ASTM E399. Since it is part of ASTM E399, this will be discussed in Item 14-62.
14-28	FTG		8	Sunset Review of Table 8.1.4.2(i), LGPL2SC-V Pin, 3SLC-C Collar in Clad 7075-T6	On Hold		Not Covered	This Item was not covered.
14-62	GTG		9	Evaluate Inclusion of other Fracture Toughness Data (JIC, KJIC)	Handout	GTG-2	Continue	C. Reakes presented this Handout with input from G. Bray. An agenda will be proposed in the Fall for inclusion in Chapter 1.
15-13	MTG		multi	Clarification of Shear Orientation for Legacy Alloys	Status		Not Covered	This item was not covered.
15-19	GTG-F		9	Verification of Secondary Modulus Methods for Fasteners	Status	FTG-2	Continue	C. Shannon gave a status report. Last presented at 32nd meeting. Action was to release "records" when company/individual names were removed. Action to "Reference the original report and add to handbook." Battelle to determine if this was done.
15-36	GTG	ISG, GSG	9	Modification of Indirect Analysis Equation	Handout	A-3	Continue	B. Krile presented this item. If you have a statistician that would like to confirm the calculations for the coefficients, please contact Bob Krile. Regression analysis still needs to be addressed. Waiting until a decision is made on which method to use with non-regression.
15-38	GTG		9	Reevaluation of Degrees of Freedom Calculation for Regression with Effect of Temperature			Not Covered	This Item was not covered.
15-40	GTG	ASG, MATSSG	9	Guidelines for When Specimens Are Not From Full Thickness	Agenda	GTG-2	Approved w Changes and Closed	J. Rubadue presented this item. Revise the blue sentence of proposal to "...center, D/2, t/2, t/4,".

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	Final	Initial						
15-42	MTG		2	Casting Allowables for 15-5PH and 17-4PH Steel	Status		Not Covered	This item was not covered.
16-02	GTG		9	Updates to Strain Departure Methods for Stress-Strain Curve Analyses	Agenda	GTG-2	60 Day Approval with changes	C. Shannon presented this item. Correct text "Figure 9.8.4.3" to "Table". Opened a new item to add a figure for this and possible revise others. This was changed to 60-day approval as the Agenda was not clear that this was a complete replacement of the existing section.
16-12	FTG		8	Identifying Basis of Fastener Shear Strength on Remaining Tables	On Hold		Not Covered	This Item was not covered.
16-13	FTG		8	Corrections to Table 8.1.3.2.2(c) NAS 1921C	On Hold		Not Covered	This Item was not covered.
16-20	GTG	ETTG	V2	Equivalence Testing Assuming Change in Process (From Item 11-40)	Status	ETTG-1	Continue	D. Hall gave a status update. Please give us feedback on the suitability and usefulness of this method using real data (tool in MMPDS Dashboard).
16-23	GTG		6	Re-evaluate Guidelines for Effect of Temperature Curves			Not Covered	This Item was not covered.
17-23	GTG		9	Legacy Alloy Review Strategy – Near Term	Handout	A-3	Continue	D. Hall discussed this item briefly. K. Sabo (SAE AMS Metals Group Chair & Lockheed Martin) challenged OEM's to get their companies to fund the expense and share data (reducing cost for each OEM).
17-25	GTG		9	Re-evaluation of Reduced Ratio Sample Size Determination			Not Covered	This Item was not covered.
17-28	GTG-F	FTG	9	Consideration of Origin in Multiple Regression Analysis for Joint Allowables	Agenda	FTG-1	Continue	W. White presented this item with Item 12-50. A separate telecom will be held for these items.
17-29	GTG-F	FTG	9	Replacement of T90 Yield Curve with a Multiple-Regression Typical Yield Curve for Joint Allowables	Agenda	FTG-2	Approved and Closed	W. White presented this item.

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17-32	FTG		8	Edit Table 8.1.5.1	Agenda	FTG-1	Approved and Closed	C. Reakes presented this item to show a correction to Table 8.1.5.1.
17-34	GTG	SSWG	9	Guidelines for Rejection of Stress-Strain Curves from Parametric Analysis	Status	GTG-1	Continue	Battelle is still investigating the difference in modulus calculations. An agenda item will be prepared for the Fall meeting.
17-45	MTG		3	Effect of Temperature Curves for 2395-T84 Extrusion	Status		Not Covered	This Item was not covered.
17-52	GTG	FatWg	9	Review Section 9.6.1 - Load and Strain Control Fatigue	Status	GTG-1	Continue	D. Hall discussed this item. Text is being reviewed and the Box-Cox method will be added. Working with ISG tool for conformity between tool and text in MMPDS. Let Doug know if you are interested in joining the Fatigue Working Group.
17-56	MTG		3	FCG Analysis for 2397-T87 Plate			Not Covered	This Item was not covered.
17-61	GTG		9	Revising R-curve Requirement in Table 9.2.4		FatWG	Not Covered	This Item was not covered.
17-62	GTG		9	Revising Fatigue Requirement in Table 9.2.4		FatWG	Not Covered	This Item was not covered.
17-63	GTG		9	Use of Box-Cox Transformation in the Fitting of Fatigue Data		FatWG	Not Covered	This Item was not covered.
18-08	MTG		6	718 Investment Cast (AMS5383) Addition of Tensile A/B-basis and Elevated Temperature	Status		Not Covered	This Item was not covered.
18-10	GTG		9	Data Requirements for Forgings	Status		Not Covered	This item was not covered.
18-13	GTG		9	Guidelines for Exclusion of Low Secondary Property Test Values	On Hold		Not Covered	This item is on hold pending Item 15-36.
19-04	GTG	ETTG	V2	Considerations for Certifying an AM Part	Status	ETTG-3	Closed w no Action	Will track this effort in Item 21-18.

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19-19	GTG		9	Consideration of a new Equivalent Stress model for Load-Controlled Fatigue		FatWG	Not Covered	This Item was not covered.
19-20	GTG	ETTG	V2	Data Requirements for Volume II	Agenda	ETTG-2, GTG-3	Approved w Changes and Closed	<p>D. Hall presented this item. Compression should be changed to 20 samples, 3 heats, 10 lots since it can use indirect analysis. Bearing and shear are currently S-basis only until methods revised in MMPDS. Add footnote for shear and bearing requirement for C/D-Basis.</p> <p>Discussion on inclusion of recycled vs virgin powder. There were disagreements on if more should be added to this table. 3/70ish disapproved based on powder discussion.</p> <p>Volume II is still being developed and subject to change. Data generation may also have additional requirements from other sections of MMPDS Volume I and Volume II. Data sponsors are advised to contact MMPDS to review their testing plans.</p>
19-21	MTG		multi	Determine Buckling Notes for Existing Figures With Dual-Shape Parameters	Agenda	MTG-2	Approved and Closed	C. Shannon presented this item. Open a new item to re-evaluate figures which did not meet the current criteria.
19-25	GTG	ASG	9	Guidelines for Derived Properties for Legacy Alloys	Agenda	GTG-2	Continue	J. Rubadue presented this item. Discussion to put this on hold until Item 15-36 & 17-23 are resolved. Meanwhile continue on a case-by-case basis.
19-34	GTG		9	Waive Requirement for Bearing and/or Shear Properties When Appropriate		PSG	Not Covered	This Item was not covered.

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19-36	FTG		9	Update Section 9.2.4.7 Fastener Strength Table Sunset Clause	Handout	FTG-2	Continue	C. Reakes presented this handout item. Text in (3) needs further work. Text regarding footnotes needs to be added for (3) as well as further consideration on Watermark. An agenda will be prepared for the fall meeting to avoid conflicting information in MMPDS.
19-37	GTG-F	FTG	9	Establish a Guideline for Reinserting Chapter 8 Tables.	Handout	FTG-2	Continue	C. Reakes presented this handout for discussion. R. Goode is willing to do simulation modeling and will give a presentation in the fall. He needs help on getting actual shear cut-off data. Sub-team to work on this with Randy includes Clay Reakes (Battelle), Laurent Bourges (LISI), and Bob Gurrola (Howmet).
19-38	ETTG		V2	Process Intensive Materials & Technologies SDO Coordination	Status	ETTG-1	Continue	D. Hall gave a status update. This is an ongoing task with ASTM-AM, EWI, NIAR, NIST and SAE AMS-AM. Battelle has shared MMPDS requirements with these organizations.
19-39	FTG		8	Review Chapter 8 Tables Removed by the Sunset Clause	Agenda	ASG, FTG-1	Continue	C. Reakes presented this item. General consensus is that tables to be put back in MMPDS will require confirmation. (Tables will not be put in with watermarks.)
19-40	GTG		9	Review Section 9.4 Substantiation of Data	Status	A-3	Continue	Insufficient time to cover.
19-42	MTG		3	Confirmation of Design Properties of AMS 4202 for 7475-T7351 Aluminum Alloy Plate	Status	MTG-1	Continue	J. Rubadue provided a status update. Have data from Novelis and Kaiser. Need data from other producers. Arconic, Constellium, Japan producers & China producers.
19-43	MTG		3	Upgrade of Design Properties of AMS 4154 for 7075-T6511 Aluminum Alloy Extrusion	Agenda	MTG-2	Approved and Closed	J. Rubadue presented this item. Insufficient data to upgrade S-Basis. Data confirmed lot release up to 3 inches. Discussions on secondary properties. One objection due inability to confirm secondary properties.

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19-44	MTG		multi	Update Stress-Strain Figures to Report Bron Method Relevance	Handout	MTG-1	Continue	C. Shannon presented this handout.
20-03	GTG		9	MMPDS Review & Approval Process	Status	GTG-1	Continue	D. Hall discussed a flowchart to be added to Chapter 9.
20-04	GTG	ETT	V2	V2: MMPDS Review & Approval Process	Status	ETT-1	Continue	D. Hall gave a status update showing a review and approval flowchart.
20-09	MTG		3	Expansion of Thickness Range for 6061-T651 Plate	Status	MTG-1	Continue	J. Rubadue gave a status report. Analysis presented previously. Producers agreed to supply L & ST data for 6-12 inch expansion. Changes to AMS waiting for update of tolerances in ANSI H35.2 for plate > 8 inch.
20-10	MTG		3	Upgrade of Secondary Properties of 7075-T76511 Aluminum Alloy Extrusions	Status	MTG-1	Continue	J. Rubadue gave a status report. Kaiser to send material to AFRL for testing.
20-13	ETT		V2	CMH-17/MMPDS Coordination & Collaboration	Status	ETT-1	Continue	D. Hall gave a status update. CMH-17 & MMPDS met in April and May, 2020. A report will be circulated based on these discussions in the minutes.
20-15	GTG	MATSSG, ASG	9	Revisit Stress-Strain Data Generation Guidelines - Use of Extensometers	Status	GTG-1	Continue	C. Shannon gave a status report. Other items (Item 17-34) may influence this item.
20-16	GTG	ETT	V2	MMPDS & Additive Metals - Program Plan	Status	ETT-1	Continue	D. Hall gave a status update included in ETT slide presentation. (Correction Item 21-02 should be under Data Analysis)
20-18	MTG		2	Updates to Low Alloy Steel tables	Agenda	MTG-3	Continue	J. Rubadue presented this item but ran out of time. M. Esparragoza (Questek) agreed to help on this item

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20-20	GTG	ETTG	V2	Definitions for Volume II	Agenda	ETTG-2, GTG-3	Approved w Changes and Closed	D. Hall presented this item. It was decided to remove word "design" from D-Basis definition. For C- and D-Basis, revise to "equal or exceed X-Basis material allowable with confidence...". Change "design allowables to material allowable". Volume II is still being developed and subject to change. Additional requirements may apply. Contact MMPDS for more information.
20-29	GTG		9	Analysis of Bearing and Shear Properties with Reduced Ratios	Status		Not Covered	This Item was not covered.
20-30	GTG	ETTG	V2	Components of Variance Analysis of AM, Cast, & Wrought Ti 6-4	Status		Not Covered	This Item was not covered.
20-31	GTG	ETTG	9, V2	Definitions of "Design Allowable", "Design Value", and "Material Allowables"	Agenda	ETTG-2, GTG-3	Approved w Changes and Closed	D. Hall presented this item. GSG requested that the definitions apply to Volume II alone. A new item will be created for MMPDS Volume 1. Change "Allowable" to "Material Allowable" (various places). The statement about Design Allowables will be removed from the definition. Revise Allowable definition to add word 'bulk', "A bulk material property...". "Value" is changed to "Design value". Current FAA, DoD, and NASA policies listed in the MMPDS Foreword apply to Design Allowables published in MMPDS-Volume I. MMPDS-Volume II currently plans to publish Material Allowables which will require further showing or additional evidence for regulatory approval
20-32	GTG		9	"Should", "Shall", "Must" decision for MMPDS program	Agenda	GCC	Approved and Closed	Approved at the GCC as a Consent Agenda Item

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20-33	MTG		3	2196-T8511 Aluminum Extrusion Analysis and Upgrade	Agenda	MTG-2	Approved w Changes and Closed	Correct CYS Thickness 0.25-1.00 A-Basis to 69 ksi. Constellium is doing additional testing for shear and bearing. A new item will be opened when additional data are received.
20-34	GTG		9	Footnote for Expanded Thickness Ranges with No Secondary Properties	Agenda	GTG-2	Continue	J. Rubadue presented this item. An agenda will be prepared for the fall incorporating R. Goode's comments.
20-35	MTG		multi	Alloys Requested for Analysis	Agenda	MTG-1	Continue	J. Rubadue presented this item.
20-36	MTG		multi	Request for Secondary Property Data	Agenda	MTG-1	Continue	J. Rubadue presented this item.
20-37	MTG		3	Re-analysis of 7160-T7451 BUS e/D=2.0 (S-L)	Agenda	MTG-2	Approved and Closed	J. Rubadue presented this item. Constellium is working on addition of shear data. Shear data will be presented as a new item when received.
21-01	GTG	ETTG	V2	Foreword to Volume II	Status	ETTG-2	Continue	J. Bakuckas gave a brief statement. GSG is discussing what would be in the foreword.
21-02	GTG	ETTG	V2	Section 9.5 & 9.6 for Volume II	Status	ETTG-1	Continue	D. Hall gave a status update. Using same analysis methods as currently in MMPDS.
21-03	MTG		5	Ti-6Al-4V Die Forging Upgrade to A- and B-Basis Properties	Agenda	MTG-3	60 Day Approval with changes	J. Rubadue presented this item. There were corrections to Table 12. 60-Day proposal to confirm changes in Table 12 and include secondary properties as S-Basis only. None of the secondary properties were multiplied by the Fty(T) which is below the specification. A new item was opened for the fracture toughness information. The type of heat treatment needs to be considered in the fracture toughness data.
21-04	GTG	ETTG	V2	Section 9.2.3 - Required Test Methods/Procedures for Volume II	Agenda	ETTG-2	Continue	D. Hall presented this item. Please review and provide feedback.
21-05	MTG		5	Revision of AMS4534 C17200 Copper Beryllium Rod	Agenda	GCC	Approved and Closed	Approved at the GCC as a Consent Agenda Item

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21-06	MTG			2050-T852 Die Forging Shear Direction Correction	Agenda	GCC	Approved and Closed	Approved at the GCC as a Consent Agenda Item
21-07	MTG		3	7055-T76511 Aluminum Alloy Extrusion Increase in Cross-Sectional Area and Circle Size	Agenda	MTG-3	Approved w Changes and Closed	J. Rubadue presented this item. Correction to new cross sectional area should be >12 to 26.3.
21-08	MTG		3	Short Transverse Shear Properties for 7050-T7451 Aluminum Alloy Plate	Agenda	MTG-3	Approved and Closed	J. Rubadue presented this item.
21-09	GTG-F	FTG	9	Equation 9.7.1.4(h)	Agenda	FTG-1, GTG-1	Approved and Closed	W. White presented this typo correction to the equation at the FTG and GTG. The correction will be made in MMPDS-17.
21-10	FTG		other	Fatigue of PH13-8Mo Bolts	Handout	FTG-2	Continue	K. Olsen (Parker-Lord) gave a presentation based on his dissertation. Changed name from 15-5PH to PH13-8Mo. Interest was expressed in the presentation and in including this in MMPDS HDBK. More discussion is needed on where / if this is appropriate in MMPDS. One concern is that the data is from 1 lot and 1 manufacturer. A copy of the presentation is included in the minutes. Contact Kirk (kirk.olsen@parker.com) if you would like a copy of his dissertation or you have questions.

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21-11	GTG	ETTG	V2	Interim Data Analysis Methods: Volume II	Agenda	ETTG-2, GTG-3	Approved and Closed	D. Hall presented this item to use methods from MMPDS Vol I to analyze Vol II data submitted to the program. MMPDS allows the use of engineering judgment when existing guidelines do not apply. When required, Battelle will use engineering judgment and document the exceptions to current guidelines for committee review.
21-12	GTG	ETTG	9, V2	Clarification of Combinability	Agenda	ETTG-2, GTG-3	Approved and Closed	D. Hall presented this in ET TG and GTG. Battelle identified an inconsistency while preparing the minutes. No proposal for Vol II at this time. Open a new item for Vol II
21-13	MTG		5	Review of Section 5.5.3 Ti-10V-2Fe-3Al Comments and Properties	Agenda	MTG-1	Continue	Volunteers are needed to review Section 5.5.3.0.
21-14	MTG		2	Review of Section 2.1.2 Material Properties	Agenda	MTG-3	Approved and Closed	J. Rubadue presented this item.
21-15	GTG		1	Review of Section 1.4.3.3 Strain Rate	Agenda	GTG-3	Approved and Closed	J. Rubadue presented this item.
21-16	GTG	GSG, ASG	1	Acceptance of Column Reduction Method in Section 1.6.4	Agenda	GTG-3	Continue	J. Rubadue presented this item. Please let Battelle know if this text change is needed or if the sentence should be removed. If not needed, may propose removing.
21-17	GTG	MATSSG	9	Elongation Measurement	Agenda	A-3	Continue	Insufficient time to cover. The agenda will be presented in the Fall meeting. No changes to the agenda item are expected.

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21-18	ETT		V2	Updates from V2WG Sub-teams	Status	ETT-3	Continue	B. Grant (FAA) spoke on Cert. and Qual subteam. Worked on guidance on how used powder can be incorporated. Also worked on Item 21-20. DGA to look at data and analysis requirements for recycling. S. Cordner spoke on Materials & Machines sub-team looking at "shall" and "strongly recommended" or "recommended". Also working on IQ, OQ, PQ, and MQ. What is already documented in public specifications and differences between SDO's. D Hall gave an update on the Data Generation & Analysis. A. Steevens added that sub-team will include looking at recycle powder.
21-19	GTG		9	Chapter 9 Changes Supporting Inclusion of New Fracture Toughness Data from Item 14-62	Handout	GTG-2	Continue	C. Reakes and G. Bray presented this handout item. A final agenda will be presented in fall with Chapter 1 and Chapter 9 changes.
21-20	GTG	ETT	V2	Microstructural Submittal Requirements	Agenda	ETT-3	Continue	P. Guerrier (Moog) presented this item. Discussed that this needs further work. There were many comments on how and what this would be used for.
21-NIN	GTG-F		9	User Testing of Secondary Properties for an Existing Table w/Expanded Thickness Range			Closed w no Action	This item was incorporated into Item 17-23.
21-21	FTG		8	Update Table 8.1.3.2.2(k) to Correct Item 16-36 Error	Handout	FTG-3	Approved and Closed	C. Reakes presented this item to show a correction to the table. The correction was made in MMPDS-16.
21-22	MTG		3	Update Figures 3.7.10.1.8(e)-(h) to Correct Legend Title from Stress Ratio to Mean Stress	Handout		Approved and Closed	Approved at the GCC as a Consent Agenda Item
21-23	GTG		9	Definitions of "Design Allowable", "Design Value", and "Material Allowables" for MMPDS		GTG-3	New	From Item 20-31 to apply to MMPDS Hdbk.

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New	GTG		9	Review Stress Strain Figures 9.8.4.3(a)-(c) for consistency with updated Stress-Strain Departure Method			New	From Item 16-02. Determine if a figure is needed and if the other figures in that section are correct.
New	GTG	ETT	V2	Combinability in Vol II			New	From Item 21-12 to add combinability section to Vol II
New	MTG			Review of Stress-Strain Curves Not Meeting Current Criteria for Dual Parameters		MTG-2	New	From Item 19-21 adding buckling notes there were a few figures which did not meet the current criteria for the Bron method. These figures will be re-evaluated.
New	MTG		5	Revise Fracture Toughness Table for Titanium Alloys			New	From Item 21-03 fracture toughness. This item is to discuss if another column needed is needed for titanium alloys to identify which heat treatment was done.