Special Committee 147

MINIMUM OPERATIONAL PERFORMANCE STANDARDS FOR TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEMS AIRBORNE EQUIPMENT

The 97th meeting of RTCA SC-147 and 66th meeting of EUROCAE WG-75 was held on 12 March 2020; this was a Plenary hosted by ACSS.

The following Leadership was present:

J. Stuart Searight	Co-Chairman, Federal Aviation Administration
Ruy Brandao	Co-Chairman, Honeywell (WebEx)
Bill Booth	Co-Chairman, EUROCAE WG-75
Sheila Mariano	Government Authorized Representative (WebEx)
Donna Froehlich	Secretary, Aurora Innovations
Al Secen	Director RTCA
Alex Engel	Technical Programme Manager EUROCAE (WebEx)

Agenda Thursday, 12 March 2020

1. Chairmen's Opening Remarks / 98Introductions
2. Anti-Trust Statement & RTCA/EUROCAE Policies
3. Approval Of Minutes From 96th Meeting of SC-147/ 65th Meeting of WG-75(21 January 2020)
4. Approval Of Agenda
5. Status of Joint US/European Regulatory efforts (moved "up", before WG outbrief)
   a. Sheila Mariano
   b. Kevin Hallworth
   c. Bill Booth – European validation status
6. Outbrief from SC-147/WG-75 Working Groups
   a. SWG, TWG, CSG
7. Status of European V&V of ACAS Xa/Xo MOPS
8. Review Of Comments and Resolutions from ACAS Xu pre-FRAC/OC
9. Decision whether to Approve FRAC/OC of ACAS Xu MOPS
10. Review Of Comments and Resolutions from 2nd FRAC/OC for the CAS Interoperability MASPS
11. Decision whether to Approve in Principle the CAS Interoperability MASPS and to refer to PMC
12. Future Meeting Scheduling (deferred to end of session)
13. Action Items Summary
14. Close

1. Chairmen's Opening Remarks / Introductions

Stu Searight opened the joint meeting of RTCA SC-147 and EUROCAE WG-75. Mr. Searight thanked everyone for traveling to Phoenix and thanked our hosts L3-Harris/ACSS. Mr. Searight congratulated Mr. Neal Suchy on the ACAS X System Team nomination for the Collier Award. Mr. Suchy thanked everyone for their contributions to the ACAS Xa/Xo MOPS effort. He indicated that the nomination was for the whole team, not just the FAA Program Office. He continued by indicating that there are 9 impressive projects-team nominated for the Collier and it is an honor to be included among them. Mr. Wes Olson added that the winner would be announced on 3 April 2020.

Mr. Searight then invited Mr. Al Secen and Mr. Alex Engel to review the RTCA and EUROCAE policies.

2. **Anti-Trust Statement & RTCA/EUROCAE Policies**

Mr. Secen and Mr. Engel thanked our hosts and reviewed the anti-trust statement and policies that apply to the committee.

3. **Approval Of Minutes From 96th Meeting of SC-147/ 65th Meeting of WG-75 (21 January 2020)**

Mr. Searight proceeded with the next agenda item; he asked the committee if they found the minutes of our virtual plenary in January acceptable. No one identified any concerns or topics for discussion; Mr. Leeper moved that the committee approve the January Plenary minutes; Mr. Tom Hanrahan seconded. There were no objections or requests for discussion; the minutes were approved as posted.

4. **Approval Of Agenda**

Mr. Searight reviewed the published agenda, indicated some tweaks to order that would improve our flow and the scheduling of presenters. There were no additions, deletions or significant changes to the agenda.

5. **Status of Joint US/European Regulatory efforts**

Ms. Sheila Mariano announced that TSO C219 was issued on 28 February 2020.She continued by thanking all those who commented, and thanking all that helped with incorporating CP-001 related updates.

Mr. Kevin Hallworth presented on the regulatory progress for ACAS Xa/Xo in Europe; his slide deck is available in the RTCA SC-147 Face-to-Face/Plenary folder created for this week. Mr. Hallworth began by stating that he is impressed with work on ACAS Xa/Xo and expects it to be the de facto standard.

Mr. Hallworth proceeded to background information. He stated:

"To enable operation of ACAS Xa/Xo in European airspace requires:

- Successful validation, in European airspace, of ACAS Xa/Xo algorithms, including CP-001.
- Issue of European TSO (although could default to using FAA TSO)
- Revision to CS-ACNS to include requirements and guidance for certification of ACAS Xa"

Mr. Hallworth continued, stating that the current ACAS II version 7.1 is considered adequate (and safe) for European Airspace and that there are no plans to 'sunset' the current ETSO (meaning ACAS II version 7.1). Mr. Hallworth then stated for these reasons and others, the process to update Rule (to include ACAS Xa/Xo) will proceed with low priority. As a response to a question about the low priority,

Mr. Hallworth indicated the low priority is partially due to administrative decision to slow the process on rules/regulations and provide more focus on rule changes that will affect/correct that which is not working. Mr. Hallworth continued with his projections for the ACAS Xa/Xo rulemaking effort. He expects successful validation of ACAS Xa/Xo, with CP-001 changes, in European airspace.

Discussion between Mr. Brandao, Ms. Mariano and Mr. Hallworth indicated that: Despite the fact that there are reciprocal agreements between US and EUROCAE, ACAS Xa/Xo might not be allowed to fly in Europe until the rulemaking there is complete. This is because the exception process allowed for under the reciprocal agreements is not meant for regular operations and since exceptions are issued country by country. Then, Mr. Suchy pointed out: EUROCAE has an approved MOPS; ICAO gave its thumbs-up to the SARPS. Mr. Hallworth responded: Yes, but the Rule is specific on the (CAS) version, it must be ACAS II V7.1.

Mr. Hallworth continued indicating that the ETSO process is essentially complete; it was drafted in collaboration with Ms. Sheila Mariano of the FAA. He continued: The long pole in the tent is the Rule Change process; it needs to go to (the) European Commission and Parliament for approval. It may take five (5) years, although that may be a bit pessimistic. Mr. Rowlan requested clarification on whether, the FAA TSO requires any new products after February 2022 to include the new ACAS Xa/Xo Ms. Mariano indicated the 1.1 Rule allows other revisions, do not have to conform to TSO C219 immediately.

Regarding concerns with harmonization of CAS system regulations in US and Europe and impracticality of having 2 different CAS required and thus installed in an aircraft: Ms. Mariano stated this is not a safety issue, but a technical issue. We have legislation that states we can't put an undue burden on industry; we can work something out." After additional questions on the low priority of the ACAS X; Mr. Hallworth indicated that this decision to slow regulatory changes was made by the European Commission.

Discussion then focused on the multi-year delay in the European rulemaking process. Mr. Searight interjected that this is newer, better technology that is already mandated (Can we find a way to update the existing rule) Mr. Suchy noted that just a few months ago, the process was reported to take 2 years. – One of the reasons we worked on the standard and the rule-making process jointly was to get the rules synchronized. Despite the concerns, Mr. Searight indicated "We are happy that Ms. Mariano and Mr. Hallworth have coordinated their efforts. They now have an agenda to get their higher-ups to discuss and coordinate on getting the European rule updated."

Mr. Rowlan focused on a concern which would affect airlines and other aircraft owners: Manufacturers can continue to produce TCAS II systems, but any new product (in the US) would need to incorporate ACAS Xa/Xo, even though those newer system wouldn't be able to be flown in Europe.

Mr. Brandao reminded the committee that Honeywell's comments to TSO C219 indicated that a schedule conflict with the rules may occur between the FAA deadline (2022) and the European rulemaking (now projected for 2025). He continued: It would be great if a lawyer writes an opinion that the TCAS II 7.1 and ACAS Xa/Xo are functionally equivalent and the latter can be substituted for the former. Mr. Walker asked Ms. Mariano to confirm that TSO C219 refers to TSO 119 or later, and that the TSO also has a paragraph that refers to equivalent functionality. Ms. Mariano, did so, and added that the legal office provided a letter that this is sufficient. Mr. Walker requested that the letter be posted for reference/use by the manufacturers. Ms. Mariano agreed and subsequently posted the letter (reference 14CFR PT 121.356).

Mr. Brandao transitioned back to the regulation schedule: He asked if it is possible to "go on faith" and start the Notice of Proposed Amendment (NPA) process. Ms. Mariano indicated that the ACAS Xa Advisory Circular rule-making process is expected to complete by end of next year.

Supplementing Mr. Hallworth's presentation on the European Regulatory efforts, Mr. Bill Booth shared a few quick observations on the European Validation process. Mr. Booth indicated that he expects ACAS Xu validation to be completed in the November 2022 timeframe. Mr. Booth added that this is not a firm projection; he explained that there is new EUROCONTROL management which will affect prioritization and allocation of funds, and this projected date is subject to change. Mr. Booth continued on a positive note for UAS/RPAS analysis when he indicated that there is a new project on the Integration of RPAS in the European airspace; this analysis will cover travel from Class A to Class C airspace.

6. **Outbrief from SC-147/WG-75 Working Groups**

Mr. Charles Leeper described the TWG progress this week. He referred to the close-out/resolution of many Xu and DAA alignment problems that had been documented at the joint Bootcamp sessions just a couple of years ago. He indicated that the TWG had areas they were still coordinating and the next revision of DAA MOPS, DO-365B and the ACAS Xu MOPS will be in close alignment and that the coordinated work and timing of review cycles will work to ensure products that work in concert with each other.

Ms. Jessica Lopez presented the [SWG efforts in preparing for FRAC](#) and plans for the FRAC period.

Like TWG, SWG worked hard to resolve pre-FRAC comments and to prepare for FRAC. The Target of Opportunity (TOO) analysis shows that ACAS Xu performance is comparable to ACAS Xa. Since V5R0 and V5R1 we also continued to work on degraded surveillance; the V5R1 analysis and preliminary analysis of V5R2 indicates the STM is robust to degraded conditions.

There are some items related to performance analysis that we plan to do during the FRAC period:

- Rerun the complete STM analyses with ACAS Xu V5R2; including TOO and degraded surveillance
- Perform complete correlation impact on Safety analysis.

Although we do not expect big performance concerns, the former may identify any potential code changes before end of comment period, while the latter, will inform how to modify test procedures and may motivate changes in Xu MOPS correlation requirements/metrics.

As Ms. Lopez finished discussing performance, Mr. Searight observed: "This is comparable to where we were with ACAS Xa/Xo FRAC. Any requests/suggestions for changes would be expected to be vetted through the WGs and then go through the full change process to ensure "good" results."

The SWG also made significant progress with aligning with ATAR requirements from SC-228 DAA. Much of this is included in Appendix I of Xu MOPS. SWG has also made significant work on track accuracy, track uncertainty, and tracker lag. We worked with DAA to finalize the ATAR requirements and test procedures finalized which will be included in DO-366 for FRAC (in April); we need to ensure requirement values hold with ACAS Xu V5R2. The SWG also has two parallel efforts for sample tracker

implementation and there is good progress there. The ARCON/Tech Center effort is using a decoupled IMM and initial results are encouraging for ACAS Xu. The Honeywell team is tuning ACAS Xu IMM for ATAR and will provide additional and independent feedback.

As Mr. Leeper mentioned, we finished working to close-out the old DAA/ACAS Xu Bootcamp action items that were assigned to surveillance. The team has identified a small set of new requirements and assumptions needed for Xu MOPS but no ADD changes. The SWG has also identified a large set of tracker-related requirements that Xu does differently from DAA need to outline Xu method and document in DAA MOPS. SC-147 and SC-228, surveillance and tracker SMEs, will work together to finalize text changes for DO-365B.

7. **Status of European V&V of ACAS Xa MOPS**

Mr. Bill Booth indicated that there were no new findings from the EASA Café Model of ACAS Xa/Xo and that they were preparing the report and briefing for ICAO.

8. **Review Of Comments and Resolutions from ACAS Xu pre-FRAC/OC**

Mr. Charles Leeper and Ms. Jessica Lopez provided a brief summary of the Xu progress from inception to closure of the pre-FRAC effort. reviewed the resolutions of the High and Non-Concur comments from the pre-FRAC/OC.
A high level summary of the comments is as follows:

MOPS Volume 1, SWG pre-FRAC Comments:

Category	# Rcvd	# Complete	# Deferred
High	28	27	1
Medium	108	103	5
Low	98	97	1
Editorial	27	26	0
Duplicate	46	--	
Total	261	253 (97%)	7 (3%)

MOPS Volume 1, TWG pre-FRAC Comments:

Category	# Rcvd	# Complete	# Deferred
Non-Concur	2	2	0
High	39	39	0
Medium	93	88	5
Low	80	80	0
Total	**214**	**209 (97%)**	**5 (3%)**

Xu leadership considers the feedback we received very good and the numbers reflect our technical progress and our work to align the Xu alerting with the SC-147 Detect and Avoid (DAA) MOPS.

Then, Mr. Leeper reminded the committee that ACAS Xu must be in alignment with DO-365 MOPS for DAA and that SC-147 and SC-228 have been consulting with each other to ensure the Xu MOPS will align the DO-365B – the version that will address Class 3 (Xu) systems. Mr. Leeper recapped the Bootcamp process that ACAS Xu and DAA Subject Matter Experts (SMEs) used to identify areas to focus collaboration. The SMEs met initially about 2 years ago to go through DO-365 MOPS and the ACAS Xu MOPS framework to identify alignment problems. These problems ranges from definition and timing differences to other functional or performance questions between the ACAS Xu and DAA efforts. Subsequently, ACAS Xu SMEs and DAA SMEs coordinated their efforts to resolve the differences in such a way that ACAS Xu would be aligned and compliant with DO-365, while working toward timing, operational suitability and performance profile of ACAS Xu that meets the SC-147 stakeholder needs. There were 103 Bootcamp problems tracked for Surveillance resolution, about half are still being verified for completion:

	# of deltas	# Complete	# Still to Discuss or Execute
Δ DAA	44	5	39
Δ Xu	91	63	28

Similarly, there were 128 Bootcamp problems allocated to Alerting and Guidance areas of the Xu MOPS, many are resolved, with about half still being verified for completion:

	# of deltas	# Complete	# Still to Discuss or Execute
Δ DAA	71	10	61
Δ Xu	75	62	13

Resolution of all Bootcamp items are coordinated with the SC-228 DAA and Surveillance teams. The Xu working groups will continue to coordinate and resolve these items during the upcoming review period. Mr. Leeper identified to activities that will be a major focus in order to continue to ensure alignment with SC-228 and the DO-365 MOPS. First. Ms. Smearcheck will work with SC-147 and SC-228 Subject Matter Experts to develop a draft appendix for DO-365; this appendix will describe how Xu complies with DAA alerting requirements, describes any surveillance-related exceptions, and justifies use of metrics matrix for performance/timing requirements. The committees will also work together to kick off a small subset of SC-228 DAG (led by Conrad, NASA) to put together draft of Display and Aural requirements for horizontal RAs.

9. **Decision whether to Approve FRAC/OC of ACAS Xu MOPS**

Mr. Charles Leeper provided a summary of the FRAC approach and products under review. Mr. Leeper indicated that all comments from the pre-FRAC of ACAS Xu MOPS were resolved in an acceptable manner and that the MOPS Volumes 1 and 2 have been provided to RTCA for release. Mr. Leeper indicated 1) the ACAS Xu MOPS defers/refers to the SC-228 DO-365 DAA MOPS for certain categories of requirements and that the ACAS Xu MOPS cannot standalone without the sections in DO-365 that address display, downlink, surveillance systems and their requirements. Mr. Leeper also highlighted the fact that the two MOPS will be synchronized with the release of DO-365B, which is also scheduled for publication by the end of this calendar year. Mr. Leeper also noted that DO-365 is not a joint RTCA/EUROCAE document. Mr. Leeper stated the Xu leads would like to propose a 30 day FRAC period for the ACAS Xu MOPS. The discussion that followed identified the following points:
- SC-228 is not a joint RTCA/EUROCAE working group
- ACAS Xu MOPS is dependent upon and synchronized with the SC-228 DO-365B which is not joint with EUROCAE
- ACAS Xu Leadership wanted the shorter comment time in order to have a little more time to resolve comments; this time is especially crucial if any of comments affected the ADD or system performance
- The SC-147 Terms of Reference (TORs) state RTCA and EUROCAE are working jointly on the ACAS Xu MOPS
- It is unclear how EUROCAE can deliver/approve/publish the ACAS Xu MOPS without the DAA MOPS

The last point brought out a point regarding scope of comments on the ACAS Xu FRAC/OC; that is, any comment submitted that would ultimately affect the DO-365, DAA MOPS would have to be resolved in favor of DO-365, as ACAS Xu must comply with the DO-365 MOPS.

Regarding the duration of FRAC/OC: the RTCA and EUROCAE directors indicated the FRAC review is set at 45 days. However, they agreed that the documents could be released on the following day, so the FRAC/OC could start on Friday, March 13th and end Monday April 27th, providing the team with a few additional working days for comment resolution.

In order for those who have not been closely following the Xu Working Group efforts, Mr. Garfield Dean requested that SC-147 leadership arrange a briefing from SC-228 on DO-365. He suggested providing a guide through the documentation with respect to DAA functionality vs ACAS Xu functionality (performance) and how the alerting is handled. After some discussion, Mr. Dean, and other interested parties were requested to read Appendix C. Mr. Dean to indicate to Mr. Walker the scope/type of questions that still need to be answered and he will arrange a briefing. Ms. Sam Smearcheck indicated that this briefing may identify and provide information that would be useful to include in Appendix C.

Mr. Ruy Brandao reminded the committee that the Test Suite is always the long pole in the tent and out of manufacturer/vendor necessity will continue to be reviewed after FRAC/OC and, like ACAS Xa, the team may need to address Test Suite requests beyond this time period.

Mr. Charles Leeper moved that the ACAS Xu MOPS go to FRAC; Mr. YiLiang Chen seconded the motion. There were no objections or requests for further discussion. The motion was approved.

10. **Review Of Comments and Resolutions from 2nd FRAC/OC for the CAS Interoperability MASPS**

Mr. Garfield Dean summarized the comments on the Interoperability MASPS.

Summary of Comments				
	Number	Not Started	In Process	Complete
Non-Concur	0	0	0	0
High	24	2	8	14
Medium	51	34	6	11
Low	91	73	1	17
Editorial	94	91	0	3
Total	260	200	15	45

Mr. Dean indicated that the comment tracking spreadsheet needs update. Many of the simplest editorial and low comments were resolved without difficulty on Monday, and need to be reviewed and accepted/marked as complete. He continued that the F2F also have resolutions for a majority of the high priority comments, where the commenter is not a member of CSG, these need to be reviewed with the commenter.

Some high comments that require additional work/ discussion were brought to the Plenary's attention:

- SAAB comment "228 CA function can issue a red alert but not an RA, they may consider the CA function to not be a CAS".
  MASPS actually states:
  > "The DAA collision avoidance function is a CAS". Note also that red alert is implying immediate action and as such would by definition be CA, from an ATCO point of view."

  CSG will continue discussion on this after Plenary, interested parties are invited to join the CSG.

- Comment #30 (Note: CWG had an exchange of views with the commenter before formal submission of the comment)
  SAAB Comment:
  > "According to the RPAS Manual the separator can be either the pilot (using RWC) or the ATCO. If this section applies to separation provided by the pilot does the same apply to the ATCO."

  FRAC2 MASPS text:
  > "RWC functions shall (R4.4) ensure that any guidance is compatible with RAs issued against the RWC-equipped aircraft.
  > Note 3: Any manoeuvres within 50 seconds of closest approach will interact with ACAS CA."

  CSG feels this is an operational issue, not a MASPS issue, but is open to comments/input from the committee

- Comments #44766 and #44767
  These comments propose requirements that CAS will fail itself if own aircraft address is all 1s or all 0s
  HAZOP team developed worked on these during FRAC2.
  CSG will accept these requirements.

- Comment # 44823 Coordination in the presence of duplicate addresses
  Raised by CSG members during FRAC2 following discussions in the HAZOP group.
  Proposes a requirement that CAS not send coordination messages to a junior CAS whose address is the same as a 3rd party address
  This was seen as a neat solution to recent discussions about UAT threats. However, it is currently under debate in the CSG because there is a choice between two evils:
  - Fail to coordinate with the threat that caused the RA (as proposed) or,
  - Send a wrong coordination message to a CAS (with the duplicate address) that will believe the message is intended for it.

Mr. Dean also indicated that 32 comments were duplicates (double-entered). For ease of administering these comments, the 30 duplicates the resolution will refer to the comment number of its duplicate and be marked as Complete.

If Committee Members want to participate in the resolution of any comments, please let the Coordination Subgroup leadership know, or just join their regularly scheduled meetings.

The CSG is in the process of scheduling meetings in the following timeslots:

Every Monday 10am-Noon EDT (except Easter Monday)

Every Wednesday 8am-10am EDT

The CSG plan to review FRAC Resolutions and accept the Interoperability MASPS at the next Plenary 4 June 2020.

11. **Decision whether to Approve in Principle the CAS Interoperability MASPS and to refer to PMC**

Mr. Searight and Mr. Garfield agreed that there hadn't been sufficient time to develop an approach for resolution to all comments rated above Medium. They further agreed that because of this, it made sense to allow the CSG to work through the comments at a reasonable and sustainable pace. The request to approve Interoperability MASPS was not proposed and will be revisited at the next Plenary.

12. **Future Meeting Scheduling**

The next face-to-face Working Group meetings and Plenary are still scheduled for June 1-4, 2020 in Seattle, WA. Key on the agenda is final comment resolution on Xu, and for Interoperability MASPS. We hope to be able to approve sending both of these documents to the PM. Mr. Searight commented: "We will plan on having our Plenary week then, even if this virus is still around. The committee leadership has decided that we don't want to consider relocating; if we can't travel to Seattle, we probably can't travel elsewhere." Mr. Searight continued: The committee leadership will make the call whether or not holding our Plenary and Working Group meetings in Seattle (June 1-4) on May 4, 2020.

The committee has RTCA meeting space scheduled for: September 14-17, 2020 and December8-10, 2020. The current plan is to focus on sXu during the working meetings. It is possible we would hold a plenary if ACAS Xu needs to approve an update to the Xu MOPS, such as for the Test Suite.

Year	Dates	City	Venue	Host Organization	Focus
2020	June 1-4	Seattle, WA*	FAA Western Regional Office* (WGs w Plenary)	RTCA	Address ACAS Xu FRAC/OC comments Approval of ACAS Xu MOPS Coordination with sXu efforts
2020	Sep 14-17	Washington, DC	RTCA Headquarters	RTCA	WGs (w Plenary?) Final ACAS Xu Acceptance (if needed) DAA Coordination among sXu efforts
2020	Dec 8-10	Washington, DC	RTCA Headquarters	RTCA	Working Group Meetings

13. Action Items Summary

With approval of ACAS Xu MOPS to undergo Final Review and Comment (FRAC)

Mr. Al Secen committed RTCA would release the ACAS Xu MOPS Volumes 1 and 2) on Friday March 13th, FRAC Close will be in synch with end date from EUROCAE>

Mr. Alex Engel committed EUROCAE will release Xu MOPS Vol 1 on Friday March 13th (Vol2 may be released on Saturday) the end of FRAC will be April 27.

Mr. Garfield Dean to indicate to Mr. Walker the scope/type of questions that still need to be answered regarding the relationship and scope of DO-365 DAA MOPS vs DO-xxx ACAS Xu MOPS; Mr. Walker will arrange a briefing.

14. Close

Mr. Searight announced that two of our long term committee members are retiring with the culmination of the Interoperability MASPS; he thanked Mr. Ken Carpenter and Mr. John Law for their technical expertise, and unerring support to the committee. Mr. Searight continued that the two made many contributions to SC-147 documents, improving the technical correctness as well as the coherence. Mr. Searight commented that Mr. Carpenter is an excellent resource of the English language and often points out words or idioms that might be misunderstood from opposite sides of "the Pond". Again thanking the two, he invited the gentlemen to make any final comments to the assembled committee. Mr. Carpenter took the mike for the two: he indicated they had enjoyed working with everyone and were quite happy to be able contribute to ACAS X standards and the Interoperability MASPS. He continued that both of the felt that upon the acceptance of the Interoperability MASPS, they could confidentlyhand-off their involvement to the younger generation for enthusiastic and a thorough approach tofinishing the UAS and small UAS efforts.

Mr. Carpenter then referred to Mr. Searight's praises and graciously provided an example of a significant misunderstanding due to differences in language usage: Tabling a topic in the US means that it will be set aside (skipped or removed from the agenda) while tabling a topic in the UK indicates that the topic will be discussed. Mr. Carpenter continued by stating that in the UK "adjourning" is understood to be temporary, since we weren't resuming any time later in the day or week we should not be adjourning the meeting, but closing. Upon making his point, Mr. Carpenter and Mr. Searight jointly announced, "This meeting is CLOSED"

[12:00 MST]

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