SC186 Working Group 4 / EUROCAE WG51 Teleconference 11/13/01

Participants (EUROCAE):

Jean-Claude Richard (Thales Avionics)

Bob Darby (EUROCONTROL Brussels)
Philippe Caisso (STNA)
Francise Casaux (STNA)
Eric Hoffman (EUROCONTROL Brétigny)
Johnny Nillson (Swedish CAA)
Daniel Ferro (Airbus)
Others …

Participants (RTCA):

Ganghuai Wang (MITRE CAASD)
Jonathan Hammer (MITRE CAASD)
Bill Lee (Boeing)
Greg Stayton (ACSS)
Steve Koczo (Rockwell Collins)
Martin Eby (Source Systems)
Lee Etnyre (UPSAT)
David Spencer (MIT LL)
Jerry Anderson (FAA / Certification)
Jerry McCartor (FAA/AFS-420)
Joel Wichgers (Rockwell Collins)

1. WG4-WG51 Action item review

(Reference file "Working Group 4 Action Items.doc")

The WG4-WG51 action item list was reviewed and updated. Some pertinent items resulting from this discussion were:

- Action 10-01-01: WG51 provided Activity Matrix for applications of interest (see file
- Action 10-01-02: Dave Spencer sent out some initial definitions to the Terminology Subgroup and has received comments from Andy Zeitlin. Bob Darby raised the concern about reinventing definitions that already exist. Bob also noted that "application" has broad / diverse meaning and needs to be defined in proper context, e.g., ASA applications, Comm applications, etc. EUROCAE will comment on the Definitions sent out by Dave Spencer. Definition work will continue; action item remains open with status "in progress."
- Action 10-01-03: The next joint WG4/WG51 meeting will be at EUROCONTROL in Brussels on February 11-15, 2002. Tentative plan is for joint meeting with WG4,

WG 51, and WG2 (possibly also WG1 – tbd). There will not be a Plenary for this meeting. Detailed agenda and schedule are yet to be developed.

- Action 10-01-04: In progress; Johnny Nillson to review ASA MASPS vision and provide comment to Jonathan Hammer and Steve Koczo.
- Action 10-01-05: Identify representatives for WG51 applications – still being worked.
- Action 10-01-06: NUP SEVA document. Bob Darby to send it to WG4. Still open.
- Action 10-01-07: Oplink contact. Andy Zeitlin has a name to contact. He will follow up.
- Action 10-01-08: completed.
- Action 10-01-09: completed.
- Action 10-01-10: Jean-Claude Richard indicated that WG51 plans to use existing OSEDs for application descriptions. WG51 will bring OSEDs to similar level of consistency for ASA MASPS.

2. Logistics Discussion – Jean-Claude Richard

Jean-Claude raised several items concerning the WG4/WG51 work method and logistics:

1) Teleconferences, as currently conducted, are not easy to cope with. Language barrier is one area of difficulty. Also noted that these teleconferences are generally not good for detailed working discussions, but are more appropriate for coordination meetings. It is requested that a common set of documents be available for the teleconference. Jean-Claude recommended that working groups take tasks on individually in their respective work sessions.

   Jonathan suggested that individual Subgroups could hold specific teleconferences.

2) Physical meetings are more for working sessions (~10-20 people). Jean-Claude recommends for joint WG4/WG51 meetings to alternate between US and Europe. Current plans are for alternate meetings every 4 months (next meeting in Brussels, February 11-15). WG4 will also conduct additional meetings every 2 months between joint meetings, which are open to all participants. A symmetric offer for participation for the NUP meetings was also extended by WG51. Andy Zeitlin also noted that WG4 has frequent teleconferences, which are open to all.

3) Work on OSEDs. Jean-Claude noted that WG51 intends to use existing OSEDs. These OSEDs will be brought to similar levels of consistency for the ASA MASPS.

4) WG51 has set a goal of an ASA MASPS document by mid-2003. WG4 is currently planning ASA MASPS version 1 for June 2002, and is planning to work with WG51 on the follow-on version for 2003. WG4 and WG51 reiterate their strong desire to continue to share all information to maximize work efforts from both groups toward development of the ASA MASPS. Dave Spencer noted the methodology for developing ASA MASPS requirements is very important and that we need to assure consistency of this methodology between WG51 and WG4.

Action 11-13-01: WG4/WG51 leadership (Jonathan, Steve K., Bob D., and Jean-Claude) to develop additional logistics for group coordination by making proposal for subgroups, scope of effort, individuals involved, and coordination method.

3. Review of Spacing Application

Reference file "WG_51_10-13-01_AS 2.ppt."

Philippe Caisso and Daniel Ferro briefed the group on the Spacing Application from NUP "Nav Trail" and "Target Trail" types of approach spacing were described. Spacing can be time-based or distance-based. Communication phraseology was also described. A summary of performance results based on NUP simulators (which included combined simulation of ATC and aircraft) was provided. Time-based spacing was considered to be easier and smoother, with spacing achieved within the 5 second tolerance 92% of the time. No multi-aircraft (typically 5 aircraft) chain amplifying effects were observed.

4. WG4 Comments on EUROCAE OHA and OSEDs

WG4 provided a list of written comments on the OHA document. The OSEDs were not reviewed.

Andy indicated that WG4 is satisfied that the OHA follows the methodology of DO-264. The following lists the comments made as well as a summary of the discussion that followed:

1. The OHA follows the DO-264 process and format faithfully. The standard method and nomenclature, phase, listed hazards, fault trees show reaction of hazards to consequences. Connections are clear between the phases, operational consequences, and hazards though the use of detailed tables.

   There was no discussion on this comment.

2. Section 1 4th page of text fig 2.1, regarding the relation of hazard and environmental consequence and affect. This is a good way to draw the figure. We see a problem, however, in the wording of the hazard. The analysis continues to re-use the words "missing" and "corrupted," e.g., "Corrupted detection by CDTI." We view these terms as good for communications system. We question, however, re-use of these terms for ASA; as we view them as being vague. For example, we would suggest that we talk about the CDTI as having erroneously displayed data, or that the operator misinterprets data on the CDTI. We feel that who makes the error and how it comes about as being important to convey and to conduct further analysis.

   WG51 agreed in general with this comment. The word "corrupted" is to be removed from the document.

3. The analysis does a good job in listing missing data. In connection with this, we observe that some consequences may be being listed automatically, e.g., loss of separation, as in misleading data leads to a maneuver, leads to loss of separation. We

feel that it is important to discuss the consequences with domain experts to see if it is credible that a pilot would misuse misleading data to make a maneuver that leads to a loss of separation.

WG51 agreed with the comment in general, recognizes that there are other consequences, and added that only the worst case consequence was shown in the OHA.

4. *Reference file "operational consequences.doc."*

   In section 2.1, combined several consequences in one bullet. WG4 asked that the list sent out in "operational consequences.doc" be considered.

   WG51 agreed to take an **action (11-13-02)** to consider the consequences suggested by WG4 and comment on them at a later time. WG51 feels that consequences should include a list for ATC as well, as outlined in DO-264.

Comment 5 was not discussed:

5. Definition of environmental factor in Section 2.1 under bulleted list: we sense a potential language problem here; use of mitigation appears to be the same as WG4's use of avoidance.

Comments 6 through 10 were described by WG4, and WG51 agreed to consider them.

6. The document does a good job documenting and diagramming phases of application. Usually the phases are shown as being linear, there is a question if this model will fit all applications.
7. While the phase charts are very useful, and WG4 will adopt them, we are concerned that they are lacking in richness of expression, e.g., conditional situations are not clearly depicted. The phase charts are clearly useful for a high-level understanding of the application, but we would like to consider process charts as possibly necessary to explore the detail of the applications.
8. It seems to us that a similar method could be applied to the process charts in terms of determining failures. The consequences of the failures may be more readily apparent in the process charts.
9. A good example of the limitations of the phase charts is illustrated by comparing our process chart for approach spacing: identifying lead traffic vs. the phase chart for extended station keeping. There is a conditional loop described in our process chart that shows success / failure of the crew identifying lead traffic on the display. This is not captured in the phase charts.
10. We feel that thee is a need to capture normal and non-normal processes. Detected failures should show up in the process/phase diagrams.

Action Item 11-13-03: WG51 to provide feedback on WG4's OHA comments 6 – 10.

5. Work Matrices

The discussion of work matrices was deferred to the November 28 teleconference with WG51. Jonathan suggested that the matrix be discussed and coordinated by WG51/WG4 leadership.

The discussion briefly reverted to the Teleconference schedule. Jonathan sent out a teleconference schedule. WG51 agreed to the joint teleconference schedule through February 2002, with approximately 1 teleconference per month.

At this point the joint WG51/WG4 teleconference concluded. WG4 continued the teleconference on the below subjects.

6. Phase Diagram Review / Discussion

(Reference files State_Chart_Introduction_2001_10_13_by_Joel_Wichgers.doc, Approach spacing phase & process figures 0.1.ppt).

Joel Wichgers will be working the phase diagrams for the ASSA and FAROA part of the Rockwell Collins task. He recently joined the team and provided a high-level perspective of his approach to developing these diagrams. He sited the Statemate methodology as the underlying approach. He provided a generalized approach to the multi-tasking nature of how the flight crew performs its tasks. He also noted that it might take a combination of a functional / flowchart view (similar to the approach followed by the WG51 phase diagrams) and a state diagram view.

Andy noted that the more formal state approach would be appropriate for more rigorous and complete description of more complicated applications, but also noted that people closely associated with the operational perspective tend to like the flow approach used by WG51. More or less either of these approaches may be appropriate.

Jonathan asked if Joel could provide some feedback on the current MITRE Approach Spacing process diagram. Joel agreed to further discuss this with Jonathan.

Dave Spencer noted that we should fit the diagram into the hazard assessment approach used by WG51.

Jonathan then reviewed the Approach Spacing document. He noted three major phases; setup, conduct, complete the operation. He noted that the process is then to address each of the processes and sub-processes in the diagram to identify what could go wrong during each step (i.e., hazards) per WG51's approach. These are then added to the safety table.

This concluded the teleconference. Plans are to continue discussion of phase diagrams for each of the applications at the WG4 teleconference on November 28.