



To SAI Subcommittee **Date** July 12, 2011

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Subject **Meeting Report**
Selective Calling (SELCAL) Exploratory Teleconference
June 21, 2011 (time 1430 to 1621 UTC)

Summary The Airlines Electronic Engineering Committee (AEEC) held a SELCAL Exploratory Teleconference on June 21, 2011 to address the possible expansion of the available SELCAL code pool. The meeting was conducted by telephone and WebEx. The following agenda was used during the meeting.

Agenda:

1. Selective Calling (SELCAL) system description
2. Description of the SELCAL problem including system statistics
3. Mitigating circumstances:
 - a. Use of proper call sign read-back procedures when answering a SELCAL (Ref: ICAO Annex 10, Section 5.2.4.1.1)
 - b. Increased FANS equipage driven by Euro Link 2000+ rule and upcoming NATrack regulations
 - c. Use of Satcom voice as backup to FANS CPDLC
4. Feedback from attendees regarding extent of problem
 - a. Flight operations personnel
 - b. ATC center personnel

Additional Items (as time permits)

5. Review ARINC Characteristics and Specifications supporting SELCAL.
6. Review possible alternatives for SELCAL code pool expansion through presentations made by individuals with expertise in the SELCAL system.
7. If appropriate, review and expand the goals by the AEEC in order to establish an overall work plan that will realize the highest level of benefits from this activity. The overall work plan will define the scope of the activity, a list of deliverables, the associated schedule, and the potential contributors from the industry.

Paul Prisaznuk, AEEC Executive Secretary, chaired the teleconference.

Organizations identifying themselves during the teleconference included:

- Airlines – AAL, ASA, COA, DAL, SWA, UAL, UPS, USA
- ANSPs – ARINC, Brisbane, FAA, Gander, Ireland, Santa Maria, Shanwick
- Manufacturers – Airbus, Avtech, Boeing, Bombardier, Gables Engineering, Lockheed Martin
- Others – Aviation Spectrum Resources, Inc. (ASRI), MITRE

Agenda items 1 and 2 - SELCAL system description and SELCAL problem including statistics:

ASRI staff provided an overview of a similar presentation made to the AEEC Executive Committee during the AEEC General Session in April 2011. This allowed everyone on the teleconference to start with an explanation of the companies responsible for the SELCAL system administration and provided an explanation of the problem. A copy of the presentation is attached.

The ASRI presentation provided an explanation of what and how the SELCAL system is used to contact aircraft operating in oceanic and remote regions of the world. ASRI is responsible for the administering of the SELCAL codes, maintaining a database of codes, and providing periodic reports on the system status to the International Civil Aviation Organization (ICAO). Today there are 10,920 unique SELCAL codes available for assignment by ASRI staff. There are actually 27,285 total assignments distributed across 4,293 users of the system. Requests for new SELCAL codes are being received daily with an average of 250 SELCAL codes per month being received over the last 12 months. Much duplication of SELCAL codes exists. ASRI's intent was to determine if action should be taken to investigate possible alternatives for expanding the available SELCAL code pool without impacting existing avionics.

A survey was conducted by ASRI in February 2011 to determine if the Air Navigation Service Providers (ANSPs) are experiencing operational problems due to the shortage of SELCAL codes. Eleven out of fourteen ANSPs responded to the survey questions, and two question results were reviewed in detail during the teleconference. Three ANSPs responded that they were experiencing simultaneous duplicate SELCAL codes 1 to 2 times a day and three ANSPs indicated that were experiencing simultaneous duplicate SELCAL codes 1 to 2 times a week. Six ANSPs supported an exploratory investigation by the AEEC. The presentation concluded that ASRI was soliciting SELCAL code pool expansion to further reduce the probability of an operational error. In addition, ASRI plans to submit a proposal for SELCAL code pool expansion to ICAO committees in September 2011.

Agenda item 3 and 4 - Mitigating circumstances and feedback from attendees regarding extent of the problem

There was much discussion from the airlines and ANSPs supporting the teleconference on agenda items 3 and 4. The ANSPs provided an overview of the operational procedures utilized today to alleviate simultaneous duplicate SELCAL codes. They follow ICAO procedures for identifying the correct

aircraft using read-back procedures and secondary aircraft identification procedures using the aircraft flight number. In addition, the ANSPs indicated that they will also separate aircraft with duplicate SELCAL codes on different frequencies if available and notify other ANSPs that will be supporting the same aircraft in the future of the duplicate SELCAL codes. Although the ANSPs agreed that the procedures do work, not all the procedures currently followed are documented in regional and ICAO standards. Even though the procedures seem to work, a couple of the ANSPs supported the concept of expanding the SELCAL code pool in the future.

Numerous airlines supporting the teleconference provided their observations that their flight operations departments did not have a problem with duplicate SELCAL codes and that the ICAO procedures as defined were sufficient to alleviate the problem. It was also discussed that there did not seem to be enough statistical data to support the severity of the duplicate SELCAL code problem.

It was concluded that additional ANSP procedures used today for handling duplicate SELCAL codes needed to be documented further. It was suggested that the regional HF Frequency Guidance Material be modified to include the additional operational procedures used by the ANSPs to handle aircraft with duplicate SELCAL codes. To assure worldwide acceptability of these new procedures, ICAO standards would also need to be modified. The ANSPs accepted the action item to work on the documentation.

ASRI accepted an action item to re-instate a means for collecting duplicate SELCAL code occurrences from the ANSPs. They will develop a spreadsheet and circulate it to all ANSPs to start periodic collection of statistics on duplicate SELCAL codes. It was agreed that the statistical results will be provided to the AEEC Executive Committee at the next General Session.

Additionally, airlines participating in the teleconference offered to review the SELCAL codes assigned to their airline and return any excess codes to ASRI.

Agenda item 5 – ARINC Characteristics were not reviewed

Agenda item 6 – Possible alternatives

It was mentioned by ARINC engineering staff that when the original SELCAL code expansion was being considered by the industry, there were 4 additional tones for a total of 20 tones considered but they were not included in the publication of the standards. It was also suggested to consider allowing the use of repeating existing tones during the pairing sequences. One avionics vendors had indicated that this would not work due to equipment limitations. It was also suggested to allow a third set of tones, but this concept also had system limitations. Based on previous discussions the review of alternatives for SELCAL code pool expansion was not explored in detail.

Agenda item 7 – Not required

Future Work

A follow-up teleconference will be conducted when ANSP survey data is available for review.

Comments & Inquiries

Questions and/or comments on this report may be directed to Vic Nagowski or Paul Prisaznuk.

Attachment 1

Selective Calling (SELCAL) Survey Results

Kris Hutchison
Aviation Spectrum Resources, Inc.
June 21, 2011

SELCAL System

- Selective Calling (SELCAL) system permits selective calling of individual aircraft over the aeronautical mobile voice channels
- Designed to relieve flight crews from the need to continuously maintain a listening watch on their assigned radio channels over oceans and remote areas
- ARINC Characteristics 596-4 Mark 2 and 714-6 Mark 3 Airborne SELCAL System are the existing standards
- International Civil Aviation Organization (ICAO) is responsible for the SELCAL system definition and administering the operational procedures
- Aviation Spectrum Resources Inc. (ASRI) is responsible for administering SELCAL codes, maintaining a database of codes, and providing periodic reports on the system status to ICAO

SELCAL Problem

- Today there are 10,920 unique SELCAL codes available for assignment by ASRI staff.
- There are actually 27,285 total assignments distributed across 4,293 users of the system. Much duplications of SELCAL codes exists.
- Requests for additional codes are being received daily. Over the last year requests have averaged approximately 250 SELCAL codes/month.
- A survey was conducted in February 2011 to determine if Air Navigation Service Providers (ANSPs) are experiencing operational problems due to the shortage of SELCAL codes.
- Based on survey results, determine if action should be taken to investigate possible alternatives for expanding the available SELCAL code pool **without impacting existing avionics**.

Survey Questions

Question 1 - Name, Company, Address, Email, and Telephone number

Question 2 - Is the SELCAL system currently being used by your organization:
Yes, No, Don't Know

Question 3 - While using the SELCAL system, how often are radio operators experiencing duplicate SELCAL codes while communicating with aircraft:
Daily, Rarely, Never, Other (Please Specify)

Question 4 - If duplicate SELCAL codes are being experienced, please indicate how many times in a day an operator might experience simultaneous duplicate SELCAL codes: 1-2, 3-5, 6-10, more than 10, Other (Please Specify)

Survey Questions

Question 5 - Are duplicate SELCAL codes causing additional workload for the radio operators with a potential of possible errors: Yes, No, Sometimes, Never, Other (Please Specify)

Question 6 - Would your organization support an exploratory investigation by the Airline Electronic Engineering Committee (AEEC) into the possible expansion of the number of available SELCAL codes: Yes, No, Other (Please Specify)

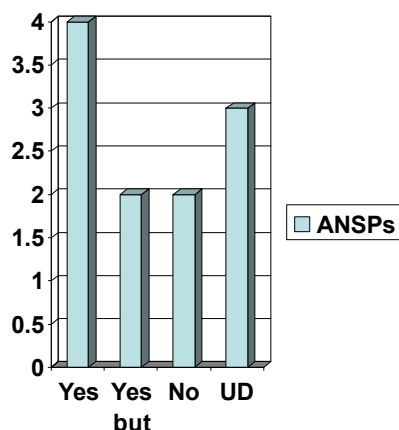
Question 7 - If the exploratory investigation results in a suggested expansion of the available SELCAL codes resulting in a SELCAL ground system upgrade, would your organization be willing to financially support the system enhancement: Yes, No, Other (Please Specify)

Question 4 Results

- Three ANSPs indicate that they are experiencing simultaneous duplicate SELCAL codes 1 to 2 times a day
- Three ANSPs responded with experiencing simultaneous duplicate SELCAL codes 1 to 2 times a week
- Five ANSPs responded with rarely (e.g. less than 1/month, 1/year, 1 time in several years) experiencing duplicate SELCAL codes

Question 6 Results

- Yes but - supports exploratory investigation but requires higher level management approval for implementation funding
- UD – Undecided meaning no opinion, didn't know, or needed decision by higher level management
- Observation - North Atlantic region seems to be experiencing most simultaneous duplicate SELCAL codes



Conclusion

- Participation in the survey was excellent with eleven out of fourteen ANSPs responding to the SELCAL survey
- Six out of the eleven ANSPs support moving forward with an AEEC Exploratory meeting to investigate possible alternatives for expanding the available SELCAL code pool
- In addition to soliciting AEEC support, ASRI plans to submit a proposal for SELCAL code pool expansion to ICAO committees in September 2011

ASRI is soliciting SELCAL code pool expansion to further reduce the probability of an operational error