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AGENDA

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FOR

THIRD SCAG CONFERENCE

12-13 SEPTEMBER 1951

(WITH ENCLOSURES)

APPENDED DOCUMENT CONTAINS
CODE WORD MATERIAL

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A G E N D A
for
T H I R D S C A G C O N F E R E N C E
12-13 September 1951

12 September 1951

PLACE: Army Security Agency Conference Room, Headquarters Building,
Arlington Hall Station, Room 119.

10:00 A.M. to 10:15 A.M.

SCAG members to be presented to Major General Ralph J. Canine,
Director, Armed Forces Security Agency and to Dr. Walter G.
Whitman, Chairman, Research and Development Board.

* * *

10:15 A.M. to 12:00 Noon

1. Approval of draft minutes of meeting of 13 July 1951 (Encl. 1).
2. Discussion of draft statement of mission of SCAG (Encl. 2).
3. Presentation and discussion of draft statement of task priorities (Encl. 3).
4. Discussion of additional membership.

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Lunch in Executive Dining Room, Arlington Hall Station Cafeteria.

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1:30 P.M.

Individual conferences with representatives of AFSA on tasks.

13 September 1951

9:00 A.M. to 12:00 Noon

Individual conferences.

2:00 P.M. - Meeting of SCAG, Room 119, Hq. Building, Arlington Hall Station

1. Résumé of individual conferences.
2. Discussion of program for period until next meeting.
3. Establishment of date for next meeting and preliminary consideration of agenda.

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1. The members of SCAG spent two days, July 10 and 11, going into the details of the main problem. Subsequent thereto the following members of SCAG met on July 12 to discuss organizational matters:

Dr. ^{Stuart} Cairns, University of Illinois.
 Mr. Joseph E. Desch, National Cash Register Company.
 Dr. H. T. Engstrom, Engineering Research Associates, Inc.
 Mr. John H. Howard, Burroughs Adding Machine Company.
 Mr. John C. McPherson, International Business Machines Corp.
 Dr. Claude Shannon, Bell Telephone Laboratories.
 Mr. Edwin A. Speakman, Research and Development Board.
 Dr. Charles B. Tompkins, George Washington University.

The following members of AFSA were also present at various times:

Capt. J. S. Harper.
 Dr. H. H. Campaigne.
 Mr. W. F. Friedman.
 Mr. O. R. Kirby.
 Mr. F. B. Rowlett.

2. A lengthy discussion took place concerning the desirability of formalizing the activities of SCAG. During this discussion, consensus of opinion indicated that the greatest contribution of SCAG members to the problems of AFSA would probably be of an individual nature. Any formalized organization of SCAG should in no way inhibit personal consultation with members of AFSA or personal initiative in attacking technical problems. However, it was agreed that some formal organization, including a secretariat to provide minutes of discussions, would be desirable. The possibility of splitting SCAG into two groups -- one to concentrate on mathematical problems and the other on the engineering problems -- was considered. It was pointed out that many of the problems involved close collaboration between the analysts and the engineers and therefore it would be desirable for SCAG to meet as a whole, although this in no wise precluded having mathematical and engineering subgroups. Further discussion of the formation of subcommittees was postponed until the next meeting.

3. The question of additional membership in SCAG was discussed. Certain problems gave indication of the desirability of asking a vacuum tube specialist to join the group. This matter was also deferred until the next meeting. The possibility of including a

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symbolic logician was discussed and it was agreed that this field was ably represented by Dr. Claude Shannon. All matters concerning additional membership were deferred until the next meeting of SCAG.

4. Matters of security were discussed and it was agreed to refer to the subject matter of the preceding day's meeting as the main problem. Subsequent to the discussions in Paragraph 1, it was agreed that SCAG should elect a chairman. Mr. Friedman inquired as to the possibility of Mr. Speakman acting in this capacity. Mr. Speakman stated that his position with the Research & Development Board precluded his accepting the chairmanship. Upon nomination by Dr. Cairns, Dr. H. T. Engstrom was elected Chairman of SCAG.

5. Mr. Friedman stated that AFSA would probably set up some counterpart of SCAG within its own organization in order to simplify liaison between SCAG and AFSA.

6. The time of the next meeting was discussed and it was agreed that the next meeting would take place on September 12. Prior to this meeting, the Chairman was charged with the responsibility of preparing the following papers for discussion:

- (a) A statement of the mission of SCAG.
- (b) A statement of the priorities of the various problems presented to SCAG.
- (c) An agenda for the meeting of September 12.

H. T. Engstrom,
Chairman, SCAG

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12 September 1951

Mission of the Special Cryptologic Advisory Group (SCAG)

1. The Special Cryptologic Advisory Group (SCAG) was set up by the Research and Development Board at the suggestion of the Armed Forces Security Agency. Its fundamental objective is to provide advice and assistance to the Armed Forces Security Agency in meeting special problems in the general field of communications intelligence. In view of its statutory responsibilities in the whole field of intelligence, the Central Intelligence Agency has expressed a deep interest in SCAG.
2. The members of SCAG are as follows:
 - ✓ Dr. ^{Stuart} Cairns, University of Illinois.
 - Mr. Joseph E. Desch, National Cash Register Company.
 - ✓ Dr. H. T. Engstrom, Engineering Research Associates, Inc.
 - ✓ Mr. John H. Howard, Burroughs Adding Machine Company.
 - ✓ Mr. J. C. McPherson, International Business Machines Corp.
 - ✓ Dr. R. K. Potter, Bell Telephone Laboratories.
 - ✓ Dr. H. P. Robertson, Central Intelligence Agency.
 - Dr. Claude Shannon, Bell Telephone Laboratories.
 - ✓ Mr. E. A. Speakman, Research and Development Board.
 - ✓ Dr. C. B. Tompkins, George Washington University.
 - ✓ Dr. John von Neumann, Institute for Advanced Studies,
Princeton, ~~University~~ *M. J.*
 - ✓ Mr. William Webster, Former Chairman, Research and Development Board.
3. Members of SCAG will be appointed jointly by the Chairman of the Research and Development Board and the Director of AFSA. It is understood that the present SCAG members will consider needs for additional membership and make recommendations to the above agencies.
4. It is recognized that the problems facing AFSA in the field of communications intelligence are of great complexity and of utmost importance. The Special Cryptologic Advisory Group was formed for the following purposes:
 - a. To provide advice and assistance to AFSA in meeting special problems.
 - b. To maintain familiarity with these special problems and make recommendations to AFSA in connection with their solution.
 - c. *To supply information in outside fields etc*

*Wenger
Kullback
Lavinion
Raven
Higley
Kirby
Campayne
Holtwick*

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5. The present membership of SCAG gives representation of the various technical fields involved in the solution of these problems, such as mathematics, statistics, electronics and computing machinery. SCAG membership also includes individuals who are familiar with the latest industrial progress in fields which may be applicable to these problems.

WALTER G. WHITMAN
Chairman, Research and
Development Board

RALPH J. CANINE
Major General, US Army
Director, Armed Forces
Security Agency

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1. a. The third SCAG conference took place at Arlington Hall Station on 12-13 September 1951. The following SCAG members were present:

Dr. H. T. Engstrom, Chairman	Dr. H. P. Robertson
Prof. S. S. Cairns	Prof. J. von Neumann
Mr. J. H. Howard	Mr. J. C. McPherson
Mr. Wm. Webster	Dr. R. K. Potter
Dr. C. B. Tompkins	Mr. E. A. Speakman

b. Absent SCAG members were:

Mr. Joseph Desch	Dr. C. E. Shannon
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c. The following members of AFSA were also present at various times:

Maj. Gen. R. J. Canine	Capt. J. S. Harper
Rear Adm. J. N. Wenger	Capt. J. S. Holtwick
Mr. W. F. Friedman	Mr. A. S. Levenson
Mr. O. R. Kirby	Dr. S. Kullback
Dr. A. E. Highley	Dr. H. H. Campaigne
Mr. F. A. Raven	Capt. J. Dennis

d. SCAG members were presented to the new Director, Armed Forces Security Agency, Major General Ralph J. Canine, USA, and to Dr. Walter G. Whitman, the new Chairman, Research and Development Board, who attended the morning session.

2. The morning session on 12 September from 10:00 a.m. to 12:00 noon was devoted to the discussion of the following matters presented by the Chairman:

a. Approval of draft minutes of meeting of 13 July 1951.

The draft of the minutes was discussed and approved, with minor corrections. At the suggestion of Mr. Friedman, it was agreed that, for purposes of "cover" outside AFSA and RDB, the designation SCAG would be understood in the future to represent the abbreviation for "Special Communications Advisory Group". With respect to Item 5 of the Minutes, Mr. Friedman reported that he would be the representative of AFSA for

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SCAG matters but that no further action had been taken in setting up a counterpart of SCAG within AFSA. Although it had been suggested previously that a secretariat for SCAG be established, Mr. Friedman pointed out the inadvisability of taking such action at this time. Dr. Campaigne was designated to prepare notes of the discussions to assist in the preparation of minutes.

b. Discussion of draft statement of mission of SCAG. (See Enclosure 1.)

Mr. McPherson suggested an addition to Paragraph 4 of the statement of mission to read: "4c. To furnish information on advances in outside fields of interest to the special problems of AFSA". It was pointed out that many SCAG members have access to knowledge of technical advances which might prove of importance in the solution of AFSA problems. After discussion, Mr. McPherson's suggested addition was adopted. Some SCAG members, particularly Mr. John Howard, were of the opinion that the statement of mission should be expanded or supplemented by a more detailed statement of the mechanics by which SCAG members may best carry out the mission. After full discussion, Dr. Engstrom and Mr. John Howard were requested to draft a schedule for supplementing the statement of mission. A paper by Professor S. S. Cairns, entitled "Comments on SCAG", dated July 23, 1951, was read in connection with the discussion and made a part of the record. (See Enclosure 2.)

c. Presentation and discussion of draft statement of task priorities. (See Enclosure 2.)

The draft statement of task priorities was presented and led to extensive discussion. Although it was generally agreed that the priorities were correctly set, it was also the consensus of opinion that the problems as stated were closely inter-related and that there would therefore be difficulty in separating these problems with any degree of completeness. The Chairman pointed out that one of the primary purposes of presenting this statement of priorities was to permit individual SCAG members to devote their time during the two-day session to those particular problems in which they were individually interested or most competent. After general discussion, however, it appeared that the SCAG members preferred to consider the problems as a whole rather than to separate and consider them individually. It was therefore decided to spend the afternoon of 12 September on Paragraph 1 and the morning of 13 September on Paragraph 2. The formal session of SCAG adjourned until 2:00 p.m., 13 September.

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~~TOP SECRET~~d. Discussion of problems of interception.

It has been indicated that AFSA has many critical problems in the field of interception. In fact, certain opinion has it that solution of questions on quality and quantity in traffic would relieve tremendously the technical burden in the analytical areas. Although there was some question of the cognizance of SCAG in this field, the problem was fully discussed. The major difficulty appears centered in the personnel problem, with both the lack of trained personnel and the rotation policy of the military mentioned as critical items. Dr. Potter, in particular, pointed out the technical possibilities in connection with late developments in such fields as search receivers and antenna design. There was an expressed feeling that the interception problems of AFSA are of such a special nature that developments for straight communications purposes were insufficient to meet AFSA's needs. It was agreed to discuss the subject further at the subsequent meeting on 13 September.

Afternoon Session

3. After discussion of the individual technical problems described in the statement of task priorities, SCAG reconvened at 1330, 13 September. The following members were present:

Dr. H. T. Fngstrom, Chairman	Dr. H. P. Robertson
Prof. S. S. Cairns	Prof. J. von Neumann
Mr. J. H. Howard	Mr. J. C. McPherson
Dr. C. B. Tompkins	Mr. E. A. Speakman

The following AFSA members were also present:

Mr. W. F. Friedman	Dr. H. H. Campaigne
Capt. J. S. Harper	Capt. J. Dennis

4. The discussion centered around the individual problems contained in the priority list (Enclosure 3) in the light of presentations of these problems by AFSA personnel during the preceding two days. Although it was agreed that informal visits of SCAG members to AFSA would be most helpful in the solution of these problems, the following specific recommendations were made:

a. Since the requirements for ultra-highspeed computation by AFSA exceed by a large margin the requirements of other agencies, it is deemed necessary that a program of basic research into ultra-highspeed electronics be initiated and supported by AFSA.

b. That basic research be a continuing subject on the agenda of SCAG.

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c. In connection with Paragraph 1 of the statement of task priorities, it was agreed that the methods of exhaustion, or scratching, was subject to abstract exposition. It was recommended that AFSA attempt to prepare an abstract of this problem on the SECRET level, in order that it may be considered by the SCAG members prior to the next meeting.

d. In connection with Paragraph 3 of the statement of task priorities, it was recommended that AFSA prepare a report on the numerous methods suggested and that prior to the next meeting, the following SCAG members -- McPherson, Desch, Howard and Potter -- review the report and make recommendations.

e. Paragraph 4 of the task priority statement was discussed and referred to Dr. Potter and Dr. Shannon for consideration.

f. The intercept problems of AFSA were again discussed. Capt. Dennis answered questions concerning traffic volumes and other statistics. After thorough discussion, it was agreed that Dr. Potter should look into the question to see if SCAG should give it further consideration.

5. a. The question of additional membership in SCAG was thoroughly discussed. The following names were mentioned during the discussion:

Deane Montgomery
Saunders MacLane
Stanislas Ulam
Marshall Stone
Mark Kac
David Blackwell
Sam Wilks
Robert Ferner
A. N. Skellet

D. H. Lehmer
Bakeley Rosser
Ralph Palmer
John Coombs
Jay Forrester
Irwin Travis
F. E. Terman
Ralph Meager

b. It was agreed that a committee consisting of Engstrom, Robertson and McPherson would give the problem of additional memberships further study, and with probable reduction in the number of candidates, this committee to report at the next meeting of SCAG.

6. Further consideration was given to the expansion of the SCAG mission. The desirability of a group serving AFSA in a capacity similar to the Board of Visitors at the U. S. Naval Academy and at other educational centers was considered. The names of Admiral Joseph E. Redman of Western Union, and Mr. Thomas E. Watson, Jr., of IBM, were mentioned. It was the consensus of SCAG members that its mission was of a technical nature and the question of a Board of Visitors for AFSA was a separate issue.

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7. Some consideration was given to the most desirable frequency of SCAG meetings. In general, meetings about three or four times per year were considered optimum. The next meeting was set for Thursday and Friday, December 6 and 7, 1951.



H. T. Engstrom
Chairman, SCAG

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