REVIEW OF DEPARTMENT OF DEFENSE WORLDWIDE COMMUNICATIONS

PHASE I

REPORT

OF THE

ARMED SERVICES INVESTIGATING SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES

HOUSE OF REPRESENTATIVES

NINETY-SECOND CONGRESS

FIRST SESSION

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LETTER OF TRANSMITTAL

MARCH 24, 1971.

HON. F. EDWARD HÉBERT,
Chairman, Committee on Armed Services
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Attached is a report entitled "Review of Department of Defense Worldwide Communications—Phase I," unanimously approved by the appointed members of the Armed Services Investigating Subcommittee conducting this review. This report is based on extensive investigations and hearings which were held during the past year and a half concerning the responsiveness of Department of Defense communications in crisis situations and the effectiveness of that Department's management of its communications systems.

You will note that there are deletions from the report. These are security deletions which have been made on the recommendation of the Office of the Directorate of Security Review of the Department of Defense.

I shall appreciate your early approval of the report so that it may be printed.

Sincerely,

ROBERT H. MOLLOHAN,
Chairman, DOD Worldwide Communications Subcommittee.

Approved for printing:
F. Edward Hébert, Chairman
May 10, 1971

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EXPLANATION OF TERMS

AUTODIN—Automatic Digital Network
AUTOSEVOCOM—Automatic Secure Voice Communications System
AUTOVON—Automatic Voice Network
CINCEUR—Commander-in-Chief Europe
CINCPACFLT—Commander-in-Chief, Pacific Fleet
CINCUSNAVEUR—Commander-in-Chief, Naval Forces Europe
COMNAVFOR JAPAN—Commander, Naval Forces Japan
CRITICOMM—Critical Intelligence Communications System
DCA—Defense Communications Agency
DCEO—Defense Communications Agency Engineering Office
DCS—Defense Communications System
DSCS—Defense Satellite Communications System
DSSCS—Defense Special Security Communications System
DSTE—Digital Subscriber Terminal Equipment
DTG—Date-time-group
IDDF—Internal Data Distribution Facility
NAVCOMSTA—Naval Communications Station
NSA—National Security Agency
SEF—System Engineering Facility
SITREP—Situation Report
SPINTCOMM—Special Intelligence Communications System
TRI-SAT—Tri-Service Tactical Satellite Program
TRI-TAC—Tri-Service Tactical Communications Program

REVIEW OF DEPARTMENT OF DEFENSE WORLDWIDE COMMUNICATIONS—PHASE I

PREFACE

Communications channels are the central nervous system of any military organization. It is through those channels that the tactical outposts report to intermediate and national headquarters logistics requirements, administrative data, intelligence data and hostile contacts. Conversely, those channels serve as the path for disseminating command decisions to lower echelons and, ultimately, to the tactical units in the field, sea and air. The function of defense communications was succinctly described by one witness as "the handmaiden which serves command and control". Just as the nervous system must be stimulated by the brain, the communications system requires a decision by the command authorities for its activation.

Several developments in recent years have accented the absolute necessity of reliable and efficient military communications. The worldwide deployment of U.S. forces has required extensive long-range systems which are capable of maintaining contact with all those forces at all times. The deployment by potential enemies of intercontinental ballistic missiles and sea-launched missiles has reduced the reaction time of this Nation, and has emphasized the need for communications which would provide the earliest possible notification to offensive and defensive U.S. forces in the event of a launch of such missiles. Finally, the centralization of command and control in national command authorities has made it imperative that information of any incident, which might possibly result in a critical situation, be brought to the attention of national authorities immediately. And, in order to permit those authorities to exercise effective command and control of their widely dispersed forces, communications must enable them to disseminate their decisions to all subordinate units under any conditions within a matter of minutes.

Deputy Secretary of Defense David Packard testified before the subcommittee that, "The entire communications capability must be integrated to provide the headquarters command and control people with knowledge of the situation and performance of all the military forces of the United States, and permit the headquarters to direct forces wherever they may be, and under whatever command they may be". The Department of Defense, in an effort to obtain communications systems which are capable of responding to those requirements, has expended large amounts, both for hardware procurement and for research and development. That Department has initiated and continued construction of systems utilizing the most sophisticated electronic equipment and employing the most advanced technology in all phases of communications. As a result of those actions, the Department of Defense has a most elaborate and a most expensive worldwide

communications network. It has been estimated that more than $9 billion has been invested in communications systems and equipment, and that annual expenditures for communications support exceed $5 billion.

SUBCOMMITTEE INQUIRY

Notwithstanding the scope and sophistication of the communications networks and systems of the Department of Defense, several incidents, which occurred during the past several years, have cast some doubt as to whether those systems are being effectively utilized. Additionally, there have been criticisms from several sources directed at the effectiveness of the management of defense communications. As a result of those questions, a review of the Department of Defense Worldwide Communications Networks was ordered by Chairman L. Mendel Rivers, House Committee on Armed Services, on July 14, 1969. In directing that inquiry, Chairman Rivers expressed an interest in improving communications reliability, promoting maximum efficiency and eliminating waste. He directed that the inquiry determine the effectiveness of communications management, its goals, as well as the economy and the efficiency of its operation. On January 8, 1970, the chairman appointed a subcommittee composed of Hon. Robert H. Mollohan (D-W.Va.), chairman, and Hon. Durward G. Hall (R-Mo.) to conduct hearings relative to Department of Defense communications.

Because of the scope and the complexity of the subject matter, the subcommittee limited this initial phase of its hearings to two areas:

1. The responsiveness of defense communications in crisis situations; and

2. The effectiveness of the Department of Defense management of its communications system.

The crisis situations examined by the subcommittee were three international incidents—the Israeli attack on U.S.S. *Liberty* on June 9, 1967; the North Korean seizure of U.S.S. *Pueblo* on January 23, 1968; and the North Korean shoot-down of an unarmed EC–121 reconnaissance aircraft on April 14, 1969.

The subcommittee began hearings on March 2, 1970, and continued them in September, October, and November. Since much of the subject matter of the inquiry was of a classified nature, all hearings were in Executive session. In addition to the testimony of the witnesses, the subcommittee was furnished with considerable information in the form of answers to written interrogatories. The Department of the Navy also furnished the subcommittee with the reports of the Naval Courts of Inquiry in the U.S.S. *Liberty* and U.S.S. *Pueblo* incidents. The subcommittee also made use of previous reports of this and other congressional committees concerning the communications facilities of the Department of Defense.

SECURITY CLEARANCE

The Department of Defense was requested to review this report for national security purposes. The word "deleted" indicates the portions which were removed at the suggestion of that agency.

FINDINGS AND CONCLUSIONS

The subcommittee finds that:

1. Communications systems are only as good as those who operate and use them in the command and decisionmaking process. The fragmented and overlapping responsibility for communications within the Department of Defense has resulted in inefficient and ineffective management of that essential defense support function. Some examples of that poor management are:

a. The Department of Defense estimates of its total expenditures for communications have underestimated those expenditures by almost $3 billion. The inability to accurately report those costs resulted from the absence of a centralized management for communications, and the lack of an accounting system to determine those costs.

b. The Department of Defense Satellite Communications System will not achieve operational capability for some time. That system has lagged several years behind commercial systems because of the "clumsy decisionmaking process" in the field of communications in Department of Defense.

c. In one procurement, the Department of Defense decision to terminate the contract was delayed for 13 months after issuing a "stop work" order to the contractor. During the year of indecision before the contract was terminated, the contractor's costs increased by approximately $2.74 million.

d. Responsibility for management of the Defense Communications System is divided between the Defense Communications Agency and the military departments. That division has interfered with the efficient utilization of the Defense Communications System.

e. The Defense Department, in its survivability studies, has failed to devote sufficient attention to an evaluation of the effects that sabotage, or limited warfare, would have upon the Defense Communications System.

f. Survivability studies have demonstrated that the overseas portion of the Defense Communications System would be vulnerable in the event of a nuclear attack.

g. The time required for processing of messages, before and after their electronic transmission, has prevented any significant improvement in "writer-to-reader" time, despite installation of automatic switch equipment. Statistics reflect that an average of 70 minutes is required for processing a "flash" message, whereas the average time for electronic transmission of such a message is only 5 minutes.

2. Unresponsive communications systems of the Department of Defense delayed the execution of command decisions and retarded the transmission of information to command officials in critical international situations. That lack of responsiveness was demonstrated by delayed messages during the following incidents:

a. Four messages, ordering that U.S.S. *Liberty* be moved away from the coasts of Israel and the United Arab Republic, were directed to that ship on June 7–8, 1967. The first of those messages was released by the sender about 13 hours before the time the ship was attacked, while the last was released for transmission 3½ hours before the attack. None of them had reached *Liberty* prior to the attack. Two messages were misrouted to the Pacific rather than to the Mediterranean. One

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of those, upon being retransmitted to the Pentagon, was then missent to Fort Meade rather than U.S.S. *Liberty*. The other was not placed on Fleet Broadcast until 9 hours after the attack on U.S.S. *Liberty*. One copy of a message was lost in a relay station and never relayed. All experienced inexcusable delays for in-station processing.

b. On January 23, 1968 two messages were dispatched from U.S.S. *Pueblo* with a Pinnacle designation. That designation denoted a message of major significance and required immediate delivery to national command authorities. As a result of delays for processing, these messages required 2½ and 1½ hours, respectively, before they were delivered to national command authorities in Washington.

c. Three messages, reporting that an EC–121 aircraft was being tracked by North Korean aircraft, were dispatched to the Joint Chiefs of Staff from Korea on April 15, 1969. Those messages required 1 hour, 16 minutes; 3 hours; and one-half hour, respectively, for transmission to Washington.

3. The lack of effective secure voice communications systems was identified as the most serious deficiency in Department of Defense communications.

4. The military departments have neglected programs for the development of officers with a proficiency in the field of communications. Time spent in achieving an expertise in communications does not receive the proper recognition by promotion boards.

5. The CRITICOMM-AUTODIN integration program should be deferred until tests have conclusively demonstrated that AUTODIN will provide transmission which is at least as effective as the existing CRITICOMM system.

6. The Defense Communications Agency engineering offices appear unqualified for the tasks assigned to them.

a. About half of the recently assembled staff of the System Engineering Facility do not possess the qualifications to perform system engineering. It was estimated that those persons will require a training period of 3 years before they will be qualified to perform that function.

b. The Defense Communications Engineering Office has compiled a poor record in the preparation and review of engineering specifications for equipment procurements. In two instances the products manufactured according to specifications were unusable. In three other procurements the correction of deficiencies in engineering specifications resulted in cost overruns from 66 percent to 100 percent above the original contract prices.

RECOMMENDATIONS

The Secretary of Defense should take the following actions in an effort to improve the management and efficiency of Department of Defense communications:

1. Responsibility for all Department of Defense communications, including strategic and tactical systems, the Defense Communications System, all systems supporting command and control, and all communications integral to weapons systems, should be centralized in the Office of the Assistant to the Secretary of Defense (Telecommunications).

2. Due to the urgency of this problem, the Assistant to the Secretary of Defense (Telecommunications) should be afforded every sup-

port necessary for completion of his program to identify all communications resources during fiscal year 1971.

3. In order that all communications costs may be properly identified, an accounting system should be established which would identify all communications expenditures, including tactical, strategic, those supporting command and control, and those which are integral to weapons systems.

4. Each military department should initiate a program for the education and training of officers as communications specialists. Those officers who specialize in communications should be assured that they will be afforded an opportunity for professional advancement.

5. The charter of the Defense Communications Agency should be revised to centralize all responsibility for management of the Defense Communications System in the Director, Defense Communications Agency. The Defense Communications Agency should be assigned management responsibility for the operation and maintenance of the entire system. Until management responsibility is centralized, either in DCA or in a designated military department, the DCS cannot efficiently function as a system.

6. The charter of the Defense Communications Agency should be revised to permit the introduction of some civilian communications experts into the management structure of Defense Communications Agency. Consideration should be given to placing civilians, with a demonstrated communications proficiency, in the vice director position and those deputy director positions which require technical expertise. Consideration should also be given to placing civilians, with a demonstrated communications proficiency, in the program management positions at Defense Communications Agency.

7. The engineering structure of the Defense Communications Agency should be objectively analyzed to determine the need for an engineering staff, the size of the staff required and the proficiency of the incumbents. Particular attention should be paid to the System Engineering Facility and whether its staff possesses the qualifications to perform systems engineering.

8. A program should be initiated to improve the efficiency of Department of Defense communications through the reduction of in-station processing time. Responsibility for this program should be assigned to the Assistant to the Secretary of Defense (Telecommunications).

9. A program should be initiated to improve the quality of the personnel who operate defense communications facilities. Responsibility for the selection, training, assignment and evaluation of operating personnel for the Defense Communications System should be assigned to the Director, Defense Communications Agency.

10. The military departments should be prohibited from using the Defense Communications Agency as a terminal assignment for officers before retirement.

11. The Department of Defense decisionmaking process should be improved in order to permit military communications systems to keep pace with developments in commercial systems, thus avoiding a repetition of the delay experienced with the satellite communications program.

12. Survivability studies of defense communications should be broadened to analyze the potential effect of limited war, sabotage and

other possible situations which would result in damage to defense communications.

COMMUNICATIONS CONCERNING U.S.S. *LIBERTY*

JUNE 7–8, 1967

Hostilities commenced between Israel and the United Arab Republic on June 5, 1967. On that same date at 2015 hours, the Commander, 6th Fleet, ordered all his surface and air units to stand off at least 100 miles from the coasts of the belligerent nations. At the time of that order, U.S.S. *Liberty* was not assigned to 6th Fleet, but was under the operational control of Commander-in-Chief Europe. On June 7th, at 0001 hours, U.S.S. *Liberty* was transferred to the operational control of Commander, 6th Fleet. At the time of her transfer, her operational orders, dated June 1st, directed that the closest permissible approach to the coast of the United Arab Republic would be 12.5 nautical miles, while she could approach no closer than 6.5 nautical miles to the coast of Israel. No action was taken by the Commander, 6th Fleet, on June 7th to cause U.S.S. *Liberty* to conform to his order previously issued to all other 6th Fleet surface and air units.

During the afternoon of June 7th, the Joint Chiefs of Staff decided to reposition U.S.S. *Liberty* to move her farther from the coasts of the belligerent nations. In implementing that decision, a series of five messages from JCS and U.S. commanders in the European Command were directed to U.S.S. *Liberty* and other addressees. None of those messages had reached *Liberty* by 1200Z hours on June 8th, 13½ hours after the first message was released for transmission. The circumstances surrounding the misrouting, loss and delays of those messages constitute one of the most incredible failures of communications in the history of the Department of Defense.

Those five messages will be discussed seriatim. Each is described according to its date-time-group, a six-numeral designation assigned by the originator of the message reflecting the date and hour, month, and year of its release. At the time of the U.S.S. *Liberty* incident, the date-time-group was not an accurate reflection of the time the message had been released by the sender to the communications center, although, in most instances, the difference in the time was an interval of only a few minutes, e.g. JCS 072230Z was released to the communications center at 072241Z. Each date-time-group includes the letter "Z" designating the Greenwich time zone, thus all times are standardized.

JCS 072230Z JUNE 1967 TO CINCEUR

This message contained the first directive from the Joint Chiefs of Staff concerning the relocation of U.S.S. *Liberty*. It was directed to the Commander-in-Chief Europe (CINCEUR), for action. Information copies of the message were addressed to Commander-in-Chief, Naval Forces, Europe (CINCUSNAVEUR); Commander U.S. 6th Fleet; Commander Task Force 64; U.S.S. *Liberty*; and others. This message modified the operational orders of U.S.S. *Liberty* by directing that her closest permissible approach to the coasts of the United Arab Republic and Israel should be 20 nautical miles and 15 nautical miles, rather than 12.5 and 6.5 nautical miles, respectively.

This message was released from the Joint Chiefs of Staff to the Army Communications Station, at the Pentagon, for transmission at 2241½ hours, June 7th. The action copy of that message to CINCEUR was not transmitted from the Army communications station until 1255Z hours, June 8th, more than 14 hours after its receipt in station. The information copies, addressed to Commander Task Force 67 [1] and U.S.S. *Liberty*, were not transmitted until 1315Z hours, June 8th, and then were incorrectly routed to the Naval Communications Station, Philippines. From that station, they were sent to Navy Communications Station, Asmara, where they were placed on Fleet Broadcast at 2135Z hours, June 8th, 23 hours after the date-time-group of the message, and about 9½ hours after the attack on U.S.S. *Liberty*.

This message lost some of its significance, since it was canceled by a subsequent message from the Joint Chiefs of Staff, described in the next section.

JCS 080110Z JUNE 1967 TO CINCEUR

Preliminary telephone call

One hour and nine minutes after releasing the above 072230Z message for transmission, the Joint Chiefs became more concerned over relocating U.S.S. *Liberty* and decided that 20 and 15 nautical miles was too close to the coasts of UAR and Israel for safety. At 072350Z hours, June 7th, a JCS representative made a telephone call to the Command Center duty officer at Commander-in-Chief, U.S. Naval Forces, Europe (CINCUSNAVEUR). In that call, a verbal directive was issued to the CINCUSNAVEUR Command Center duty officer to order U.S.S. *Liberty* to operate no closer than 100 nautical miles to the coasts of the belligerents. The duty officer at CINCUSNAVEUR was also told that a message formalizing the verbal directive would follow later. However, the JCS might as well have omitted that telephone call since it proved completely ineffective in accelerating action at CINCUS NAVEUR headquarters. It is true that, as a result of the telephone call, a message incorporating the oral directive was prepared at CINCUS NAVEUR headquarters for dispatch to Commander, 6th Fleet; but despite the urgency indicated by the JCS call, the release of that message for transmission was delayed until the formal notification message from JCS had been received.

Formal message

The promised confirmatory message was not released by the Joint Chiefs of Staff until 080110Z, more than an hour after the telephone call to CINCUSNAVEUR. That delay is not necessarily significant, since JCS could reasonably have expected an immediate and intelligent response to its telephone directive. This message, JCS 080110Z, canceled the earlier JCS 072230Z message and directed that U.S.S. *Liberty* should remain at least 100 nautical miles from the coasts of any of the belligerent nations.

An immediate precedence [2] was assigned to this message, whereas the 072230Z message had been assigned a priority precedence, thus

[1] Department of Defense has informed the subcommittee that the original message was addressed to CTF64, but that an apparent operator error caused it to be addressed to CTF67 when it was prepared for transmission.

[2] There are four Department of Defense precedence categories: flash, immediate, priority, and routine, in diminishing order. Those designations indicate the desired speed of delivery. They serve as a guide to operating personnel in processing, transmission and delivery of the message.

icating the increased concern of the Joint Chiefs concerning the ositioning of U.S.S. *Liberty*. This message was also released to the my Communications Station at the Pentagon for transmission. e action copy of this message was again addressed to Commander-Chief, Europe, with information copies addressed to CINCUS AVEUR; Commander, 6th Fleet; Commander, Task Force 64; d U.S.S. *Liberty*, among others. A delay of 44 minutes occurred in e Army Communications Station, Pentagon, before the message s transmitted to CINCEUR, the action addressee at 080211Z. al Adm. Francis J. Fitzpatrick, Assistant Chief of Naval Operations Communications, testified before the subcommittee that he thought minutes was an inordinate amount of time for processing such a ort message.

The delay in processing the action copy of the message is insignifi-nt, however, when compared with the deplorable handling of the ormation copies addressed to Commander, Task Force 64, and to S.S. *Liberty*. First, there was a delay of 2 hours, 23 minutes before ose messages were transmitted from the Army Communications enter, Pentagon, at 080350Z. The only explanation for that delay s that messages of equal or higher precedence were awaiting trans-ission before this message arrived in station. The Department of efense, however, was unable to furnish the subcommittee with any ocumentary evidence which would support that explanation.

The information copies of the message, addressed to U.S.S. *Liberty* d Commander, Task Force 64, were finally transmitted at 0350Z, t, once again, those messages for addressees in the Mediterranean ea were misrouted to Naval Communications Station, Philippines. subcommittee witness testified that the misrouting was due to an roneous routing indicator which had been assigned to the message a civilian clerk in the Army Communications Center, Pentagon. pon its arrival at the Naval Communications Station, Philippines, e error was recognized, the routing indicator was corrected to Naval ommunications Station, Morocco, and the message was retransmit-d within an hour. That correction should have taken those copies the message to the Mediterranean area and ultimately to the ldressees, except that the message was routed to pass through the rmy Communications Station, Pentagon. That station, instead of ansmitting the messages to the Navy Communications Station, orocco, to which they were addressed, sent them to National Se-rity Agency, Fort Meade, Md., where they were filed without fur-er action. The only explanation given for this inexcusable conduct as that clerical personnel had misread the routing indicator. Need-ss to say, those messages had not reached either U.S.S. *Liberty* or ommander, Task Force 64, by 1200Z hours, June 8, 1967.

USCINCEUR 080625Z JUNE 1967 TO CINCUSNAVEUR

JCS message 080110Z was received at CINCEUR headquarters t 0212Z hours, June 8th. That headquarters, in a telephone conversa-on with CINCUSNAVEUR headquarters at 0325Z hours, directed INCUSNAVEUR to take the JCS message for action. That oral rder was confirmed by a formal message directed to CINCUS-AVEUR for action, with information copies to Commander, 6th leet, and U.S.S. *Liberty*, among others. The formal message, how

over, was not released until 0625Z hours. No explanation has been offered for the 3-hour delay in preparing that message at CINCEUR headquarters. A further delay of 46 minutes occurred in the message center at CINCEUR before the message was transmitted.

In order to ensure getting this message to its addressees, it was transmitted concurrently over two alternate relay paths. The necessity for the alternate transmission was quickly demonstrated by the loss of the message at the Pirmasens, Germany, Army DCS relay, the first station on one of the transmission paths. As a result of that loss, there was no further transmission of that copy of the message. The explanation offered for the loss of that message was that the

*** * * station was being operated under a combination of adverse conditions caused by the consolidation of commands and relocation of units from France. Heavy traffic volumes resulted from the extensive relocation of units and retermination of teletype circuits. The number of qualified personnel was inadequate to ensure error-free processing of traffic.**

The second transmission route succeeded in getting the message to CINCUSNAVEUR and to Commander, 6th Fleet, by 0735Z hours on June 7th. The information copy directed to U.S.S. *Liberty*, however, had to pass through additional relay stations before it could be placed on fleet broadcast for dissemination to U.S.S. *Liberty*. That meandering route through relay stations consumed another 9 hours. During that time, there were long in-station delays for processing of the message, and there was a delay of more than 2½ hours in passing the message from an Army DCS Communications Station at Asmara to the Navy Communications Station located within a mile of the Army station. Finally, the message was placed on the fleet broadcast at 1646Z hours, June 8th,[3] at which time U.S.S. *Liberty* was limping back to port with her dead and wounded, and so severely damaged that she was subsequently scrapped.

CINCUSNAVEUR 080455Z JUNE 1967 TO COMMANDER, 6TH FLEET

The headquarters, Commander in Chief, U.S. Naval Forces Europe (CINCUSNAVEUR) received three separate messages directing the repositioning of U.S.S. *Liberty*. Those messages and the times of their receipt were:

(a) A telephone call from the JCS reconnaissance center at 2350Z, June 7th.

(b) An information copy of JCS 080110Z message which was received at this headquarters at 0312Z hours, June 8th.

(c) A telephone call from CINCEUR at 0325Z hours, June 8th.

Despite the urgency which must have been obvious by that time, no action was taken at that headquarters for more than 3½ hours after the initial telephone call. It was not until after receipt of the telephone call from CINCEUR at 0325Z hours, June 8th that CINCUSNAVEUR headquarters stirred into action. At that time, the duty officer directed that a teletype conference be established with Commander, 6th Fleet. That conference circuit was established, and

[3] A garbled version of this message was placed on fleet broadcast at 1059Z, June 8th, and there was some question whether it had been received by U.S.S. *Liberty*. But as Rear Admiral Fitzpatrick testified, "It is a moot point whether the ship received it or not for two reasons: If it did receive it, it was probably useless to them, and number two, even if they had received it, it wouldn't have made any sense to them because all it said was to take some other JCS message for action, some higher commander, and they wouldn't have known what that other message was because, as we know, that other message from the Joint Chiefs of Staff, which they had the information copy on, didn't get to them."

at 0115Z hours, Commander, 6th Fleet, acknowledged receipt of the order to take action upon the JCS message. The teletype order was confirmed by CINCUSNAVEUR formal message 080455Z which was received by Commander, 6th Fleet, at 0518Z hours, June 8th.

For some unexplained reason, U.S.S. *Liberty* was not informed of either of these messages to Commander, 6th Fleet.

COMMANDER, 6TH FLEET 080917Z JUNE 1967 TO U.S.S. LIBERTY

Upon receipt of the messages from CINCUSNAVEUR, the only action remaining for Commander, 6th Fleet, was issuance of an order to U.S.S. *Liberty* to comply with the minimums directed by the Joint Chiefs of Staff. It was not until 0917Z hours, June 8th, however, more than 4 hours after his receipt of the order, that he released his action message directed to U.S.S. *Liberty*. Although his superiors had manifested their concern about repositioning U.S.S. *Liberty* by telephone calls which gave him advance notice of the order, the Commander, 6th Fleet chose not to use the voice circuit when he passed the order to the ship. Rather, he used the normal communications system for transmission of his message.

After its release to the communications center aboard the 6th Fleet flagship, U.S.S. *Little Rock*, that message was delayed for more than 1 hour and a quarter before it was transmitted at 1035Z hours. The explanation for that delay was that there were one flash and seven immediate messages being prepared for transmission at the time the message was received in the message center aboard U.S.S. *Little Rock*. The message arrived at the Army DCS station at Asmara by 1200Z hours, June 8th. That station, however, instead of delivering it to the nearby Navy station for fleet broadcast, missent it to the Navy Communications Station, Greece. It was returned to Army DCS station at Asmara and finally delivered to the Navy Communications Station at 1510Z hours, June 8th, 6 hours, 8 minutes after its release by Commander, 6th Fleet, and more than 10 hours after he had been ordered to act upon the Joint Chiefs of Staff instruction. The message was transmitted on fleet broadcast at 1525Z hours, June 8th, more than 3 hours too late to alert U.S.S. *Liberty* to the danger of her position.

The circumstances surrounding the transmission of those five messages could be considered a comedy of errors were it not for the tragic results of the failure to move U.S.S. *Liberty*. At 1210Z hours, June 8, 1967, U.S.S. *Liberty* was attacked by Israeli aircraft and, at at 1235Z hours, she was torpedoed by Israeli patrol boats. As a result of those attacks, 34 officers and men were killed, while 75 were wounded, and the ship sustained such severe damages that it was never restored to duty. At the time of those attacks, U.S.S. *Liberty*, through no fault of hers, had not received any of the above-described messages. If the communications system had been responsive, she should have had several hours during which she could have placed some distance between herself and the coast, thereby probably avoiding the attack.

Should there be any doubt that those failures of the communications system were critical, the following excerpts from the findings of fact of the Naval Court of Inquiry, convened to inquire into the circumstances surrounding the attack on U.S.S. *Liberty*, would appear to conclusively resolve them:

Liberty's position at the time of the attack had been previously ordered chang farther to seaward by JCS; however, the messages relating to these changes wer not known to the ship before the attack took place * * *

The communications delays and misrouting errors, which caused these several nondeliveries, combined with delays in initiating followup actions on operational instructions received, all contributed to the ship itself being unaware of plans and decisions made for her repositioning * * *

* * * *Liberty* received no directive, prior to the attack, that higher authority desired that the ship operate at least 100 miles from the coastline of the UAR * * *

Pertinent to the findings of fact is the matter of communication conditions regarding U.S.S. *Liberty* during the period 1 and 8 June. The ship is known not to have received at least five messages sent prior to the attack, each of which was not only important but, in that respect, critical to the events which terminated in the aggravated attack on this ship on June the 8th.

Higher authority modified *Liberty's* original operational guidance between June 1st and the attack on the 8th which, if she had received it, would have resulted in her being further off shore.

Combination and compounding of many delayed communication deliveries related to *Liberty* incident denied the ship the benefit of command decisions actually made prior to the attack which, among other things, would have caused the ship, as a minimum, to be heading further off shore from her 081200Z actual position * * *

COMMUNICATIONS CONCERNING U.S.S. PUEBLO JANUARY 23, 1968

On January 23, 1968, U.S.S. *Pueblo*, a U.S. Navy auxiliary general environmental research vessel utilized for intelligence collection, was located off the coast of North Korea. That morning the ship established communication with Naval Security Group at Kamiseya, Japan, to send a situation report (SITREP), two technical reports and a service message. At 0300Z, January 23, *Pueblo* was still using her transmitter when a North Korean submarine chaser (SO-1) came into view. There were some flag-hoist signal exchanges between *Pueblo* and the North Korean craft which consumed several minutes. Then at 0350Z the commanding officer of *Pueblo* released the first of two messages designated Pinnacle. Pinnacle is a flagword which identifies the message as having major significance and requires immediate delivery to National Military Command authorities at the seat of government. In addition to its Pinnacle designation, the message was assigned a "flash" precedence, thereby identifying it for most rapid processing, transmission and delivery.

PINNACLE I—230352Z JANUARY 1968

This message reported the encounter with the North Korean patrol craft, the exchange of flag-hoist signals, and the Korean signal "Heave to or I will fire". It concluded with *Pueblo's* intention to remain in the area, if considered feasible, or to withdraw slowly to the northeast.

This message was received by the Kamiseya station at 0350Z hours. It was then relayed at 0400Z hours to Commander, Naval Forces, Japan where it was received at 0413Z hours. Despite its Pinnacle designation, which required immediate delivery to National Military Command authorities at the seat of government, this message was delayed at the headquarters of Commander, Naval Forces Japan, for 47 minutes before it was finally released for retransmission at 0500Z hours. Rear Adm. Francis Fitzpatrick, Assistant Chief of

aval Operations for Communications and Electronics, testified that ne delay in that headquarters was not consistent with the Pinnacle esignation of the message or with its flash precedence. He explained ne the delay was caused by the decisionmaking process at that eadquarters and that "involved in that decision process was restruc-uring the message to take it out of * * * intelligence channels, and ut it into the general service channel." While some time was re-uired for such processing, 47 minutes appears to have been an uncon-ionable delay in retransmitting a Pinnacle-flash message.

At 0500Z hours, the headquarters of Commander, Naval Forces apan, relayed the message to Naval Communications Station, apan, for relay to the remaining addressees. At this station, the essage was transmitted to the Navy addressees via the Navy ommand Operational Network, a dedicated network,[4] and was ansmitted to all other addressees via the Defense Communications ystem, the common user system. The former network functioned irly well with each of the Navy addressees receiving his copy of the essage by 0533Z hours—33 minutes after it had been relayed by ommander, Naval Forces Japan, and 1 hour, 43 minutes after it ad been transmitted from U.S.S. *Pueblo*. The Defense Communica-ons System was incredibly slow in transmitting the message to the ther addressees for whom it was responsible. The message was troduced into the DCS at 0508Z hours. It did not reach any of its ldressees, even those in Japan, until 0600Z hours, and it was 0624Z ours before it reached the Joint Chiefs of Staff—1 hour and 16 minutes ter being transmitted from Japan and 2 hours, 34 minutes after it ad been sent from U.S.S. *Pueblo*.

PINNACLE II—230415Z JANUARY 1968

This message was also assigned a "flash" precedence and trans-itted from U.S.S. *Pueblo* at 0418Z hours. It stated that the submarine nser, which had been joined by three PT boats, had sent a message, Follow in my wake. I have pilot on board". It further reported .S.S. *Pueblo* was departing the area at ½ speed "under escort". innacle II was considered by the U.S. Navy as a "trigger" message, ; it provided conclusive evidence that the conditions described in innacle I were more than routine harassment.

Transmission of this message to Kamiseya was instantaneous and was received in that station at 0418Z hours. From there it was layed to Commander, Naval Forces Japan at 0424Z hours. In that eadquarters, this message also experienced a delay which was not onsistent with its Pinnacle designation or with its flash precedence. .was39 minutes after receipt in that headquarters before Commander, aval Forces Japan, passed the message to its communications station . 0503Z hours for transmission to the remaining addressees. As with innacle I, the Naval Command Operational Network was used to ute the message to Navy addressees while Defense Communica-ons System was used for all others. The message was delayed briefly . Naval Communications Station, Japan, before being introduced to the Naval Command Operational Network at 0510Z hours. That

[4] A dedicated network, or circuit, is one used exclusively for transmission of a particular type of infor-ation, in this instance Navy operational orders. It is distinguished from a common user system which ansmits all traffic of Department of Defense without regard to its originator or content.

network performed satisfactorily in getting the message to each of the Navy addressees by 0525Z hours.

The message was delayed for 18 minutes at Naval Communications Station, Japan, before it was introduced into the Defense Communications System at 0521Z hours. The cause of that delay could not be determined. The performance of that system in transmitting this message was better than it had been with the earlier Pinnacle I. Copies reached all addressees within 56 minutes of the time it was transmitted. It reached the Joint Chiefs of Staff at 0557Z hours—36 minutes after being introduced into the DCS, and 1 hour, 39 minutes after it had been transmitted by U.S.S. *Pueblo*.

CRITIC MESSAGE TRANSMISSION

In addition to the above-described transmission, both Pinnacle messages were also given a Critic [5] message format. That format entitled them to transmission via the CRITICOMM network. Their rapid transmission in that dedicated system presented a sharp contrast to their sluggish movement through the common user Defense Communications System.

It was not until Pinnacle II was received at Kamiseya and Commander, Naval Forces Japan, that the CRITICOMM network was utilized. After receipt of that message at 0418Z hours, Kamiseya Station gave it a Critic format and introduced it into the CRITICOMM network at 0436Z hours. Seven minutes later that Critic message was delivered to the Joint Chiefs of Staff in Washington. The Kamiseya Station then placed a Critic designation on the earlier Pinnacle I message and introduced it into the CRITICOMM network at 0440Z hours. This message, referred to as Critic II, required only 6 minutes for transmission to Washington, where it was received by the Joint Chiefs of Staff at 0446Z hours. Another Critic message was released by the Commander, Naval Forces Japan, Headquarters after that Headquarters received Pinnacle II. That Critic message was assigned a date-time-group of 0435Z and was received in Washington, D.C. 4 minutes later at 0439Z hours.

The value of the CRITICOMM transmission can be clearly seen when its performance is compared with the Defense Communications System. Whereas the Joint Chiefs of Staff were informed via CRITICOMM at 0439Z hours—21 minutes after U.S.S. *Pueblo* had originated its Pinnacle II—they did not receive notification through the Defense Communications System until 0557Z hours—1 hour, 39 minutes after Pinnacle II had been transmitted from U.S.S. *Pueblo*.

COURT OF INQUIRY CONCLUSIONS

The Naval Court of Inquiry, which was convened to inquire into the circumstances surrounding the seizure of U.S.S. *Pueblo*, was critical of the deplorable relaying of the messages from U.S.S. *Pueblo*. That court stated in its opinions: "The delays in transmission of U.S.S. *Pueblo's* OPREP-3 messages (Pinnacles I and II) from Kamiseya to NAVCOMSTA (Naval Communications Station) Japan and higher commands were grossly excessive." The court of

[5] Critic is a designation assigned to a message which is believed to contain information which should be brought to the attention of the National Command Authorities.

nquiry also stated "despite the fact that telephone communications vere available between COMNAVFOR JAPAN (Commander, Naval Forces Japan) and CINCPACFLT (Commander-in-Chief, Pacific Fleet), the Fleet Commander was not immediately informed and kept current of the developments in the U.S.S. *Pueblo* incident. Information he received was delayed about 1½ hours; too late to be of use."

CONSEQUENCES

Those "grossly excessive" delays in retransmission of the Pinnacle messages from U.S.S. *Pueblo* were at least partially responsible for the failure of U.S. forces to come to the aid of that ship. That failure resulted in the death of one sailor, the long imprisonment of the remainder of the crew and the loss of the vessel. The special subcommittee of the Committee on Armed Services, House of Representatives, which investigated the seizure of U.S.S. *Pueblo*, found that the loss of the ship had these other consequences:

> The apparent impunity with which armed forces of the North Korean Government boarded and captured a U.S. Naval vessel in international waters, effectively destroyed the image of invulnerability and prestige enjoyed by our country for the past 150 years. The damage this incident has caused our Nation is, in truth, incalculable * * *
>
> The capture of the U.S.S. *Pueblo* resulted in a serious compromise of our Nation's intelligence capability * * *
>
> The compromise of a great deal of classified information, involving naval operations, tactical and otherwise, also represents a very serious intelligence loss * * *

COMMUNICATIONS CONCERNING EC–121, APRIL 14, 1969

At 2159Z hours, April 14, 1969, an EC–121 of Fleet Air Reconnaissance Squadron One left Atsugi Air Force Base, Japan, on a reconnaissance mission over the Sea of Japan, off the coast of North Korea. The flight of that aircraft was tracked by a U.S. station in South Korea.

That tracking station at 0334Z, April 15th, detected North Korean aircraft tracking EC–121. It continued tracking the North Korean aircraft until 0422Z when the track was dropped. At 0436Z, the track of the North Korean aircraft was once again observed by the station in South Korea. That station dispatched four messages addressed to the Joint Chiefs of Staff and several other addressees concerning North Korean surveillance of EC–121.

FIRST SPOT REPORT 150445Z APRIL 1969

This message reported that North Korean aircraft were probably reacting to EC–121. An immediate precedence was assigned this message and it was transmitted at 0454Z April 15th. It was not received at the JCS Joint Reconnaissance Center in Washington until 0615Z, April 15th—1 hour, 16 minutes after the time of its transmission from South Korea.

FIRST FOLLOWUP TO SPOT REPORT 150503Z APRIL 1969

This message reported that two North Korean aircraft being tracked were headed east toward EC–121. It also mentioned the time that the

track had first been observed and when it was finally observed. The message was assigned an "immediate" precedence. Although the exact time of transmission of this message is not known, it has been stated that, "it is reasonably certain that it would have been transmitted within 5 to 10 minutes of the DTG (date-time-group)". This message was not received at the JCS Joint Reconnaissance Center until 0807Z, April 15th, 3 hours, 4 minutes after its date-time-group.

SECOND FOLLOWUP TO SPOT REPORT 150520Z APRIL 1969

This message reported that EC–121 had disappeared from the surveilling radar screens. It was assigned a flash precedence and was transmitted as approximately 0526Z. The message was received at JCS Joint Reconnaissance Center 38 minutes later at 0558Z.

CRITIC 150544Z APRIL 1969

This message, which was designated Critic, reported that Korean air surveillance facilities reflected the possible shootdown of the U.S. reconnaissance mission over the Sea of Japan by two North Korean aircraft. As a result of its Critic designation, this message reached the National Military Command Center within 10 minutes of its date-time-group. It provided National Command authorities with the first information concerning the shootdown, as it reached Washington before any of the reports of the North Korean surveillance which had been transmitted much earlier.

Each of the earlier reports of the North Korean surveillance of EC–121 failed to satisfy the speed of service objectives established by the Department of Defense. Two of those messages carried an immediate precedence, while the third had been assigned a flash precedence. According to those objectives, a "flash" message should be transmitted in less than 10 minutes; an "immediate" in no more than 30 minutes; a "priority" in less than 3 hours; a "routine" in less than 6 hours. Actually, the flash message required 38 minutes, and the immediate messages 1¾ hours and 3 hours, respectively.

Our examination of these three situations has caused grave concern over the performance, which could be expected from Department of Defense communications, generally, and the Defense Communications System, specifically, in a general war situation. In each of the situations examined by the subcommittee, communications could be carried on under the most favorable circumstances. No facilities had been disabled, either temporarily or permanently; no enemy jamming was experienced; and there was no restriction upon use of any of the various modes of communications available. Despite those almost perfect communications conditions, messages were lost, misrouted and missent, while others experienced intolerable delays for in-station processing. In each instance, there appeared to be some reluctance to use voice communications circuits, in spite of the greater speed those circuits would provide in relaying orders or reports. In both the *Liberty* and *Pueblo* incidents, the most prominent failures occurred in facilities which were part of the Defense Communications System. The overall effect was that parties who had a need to know—in one instance the commanding officer of a ship and, in the other, National Command authorities—were deprived of that knowledge because of a

ack of responsiveness on the part of Department of Defense communications systems.

Subcommittee witnesses were quick to point out that the lack of communications responsiveness could be traced, in almost every nstance, to inadequate personnel performance rather than to equipment failure. From that assignment of responsibility, they concluded he communications systems were not responsible for the failure to et messages to their addressees in time to be effective. There does not ppear to be any logical basis for such a divorce of the operating personnel nd system hardware are essential complementary components of the ystem. Modern communications systems, notwithstanding their ophistication, are only as effective as the people who operate them nd, until the Department of Defense recognizes the importance of he selection, training, supervision and evaluation of the personnel ssigned to the operation of its communications systems, and oncentrates on their improvement, no significant improvement in communications is possible. The subcommittee hearings revealed a reluctance to recognize the potential for improvement which exists in this nost critical area. Any suggestion that the operation of the Defense Communications System could be improved by assigning to the Director, Defense Communications Agency, responsibility for the election, training and evaluation of its operating personnel, as well as esponsibility for evaluation of the performance of its stations, is ejected on the ground that it suggests a communications command. That attitude is exemplified by the following colloquy between Chairman Mollohan and Lt. Gen. Richard P. Klocko, Director, Defense Communications Agency:

Mr. MOLLOHAN. Well, we have three incidents here, and these three incidents would regard as the highest and most critical in nature. Communications have roken down very badly, to put it modestly, in each of the three incidents. We re expending $4 billion, and you have just stated that, with the communications ontrol that you presently have, in response to Congressman Hall's question, you an't assure that any better delivery process could be expected than has been the erformance record in these three.

I am sure you have carefully evaluated this, and others have, also, at the ighest levels in the Pentagon. But obviously, something rather drastic has to e done.

General KLOCKO. Yes, sir.

Mr. MOLLOHAN. And it seems that your problem is in personnel and control ather than in the command or management or operations system of DCS itself.

General KLOCKO. I am not certain that it is a communications failure. I don't ink that it was a communications failure in the DCS, and I think that having re people assigned to DCA would not have corrected any of the mistakes that ook place in these instances, sir.

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Mr. MOLLOHAN. You know, I don't think there is any question but what CS is reliable, as such. But my concern is the utilization of it properly, and this es back to the personnel point.

You seem to be very firmly convinced that any assumption of personnel reponsibility on your part would not be feasible.

General KLOCKO. Let me put it this way. In any consolidation of more reponsibility in DCA, this would be almost my last priority. There are others at I would put well beyond that, which would be in the field of planning, proaming, the operational direction over expanded portions of the communications stem.

But a command in the control of the people in the system would be very low. here are others that would produce much more effectiveness.

• • • • • • •

Since it was personnel error rather than equipment failure that was responsible for the communications systems failures, it appears that a determined effort must be initiated to improve the operating personnel and, thereby, to improve the Defense Communications System. Testimony reflected that the Department of Defense has initiated a program to automate its communications centers, thereby reducing the possibility of personnel error. But regardless of automation, there is still a personnel requirement, albeit reduced, and it is the quality of that group which must be improved in order to promote system efficiency. This subcommittee does not suggest any specific form which that improvement of operating personnel should take, whether communications command or otherwise. Our only concern is that it be undertaken immediately and that it be vigorously implemented. We believe that the Director, DCA, must be given responsibility for supervision of the personnel operating the DCS. We further believe that he should be responsible for evaluating the performance of the operating personnel and the DCS facilities.

A transfer of that authority to the Director, DCA, might lessen to a degree the control of military commanders over their communications facilities which have been assigned to the DCS. However, since those facilities comprise only one-fourth of the total Department of Defense telecommunications assets, they would still have under their direct control sufficient communications systems, equipment, and personnel to satisfy their tactical and command and control requirements. It has been demonstrated, repeatedly, that the present divided responsibility for the Defense Communications System has resulted in unresponsive communications. The Nation has already suffered incalculable damage from that lack of responsiveness. It cannot afford any repetition in this very critical period. It is imperative that immediate action be taken to upgrade the performance of all communications personnel, particularly those assigned to the Defense Communications System.

DEPARTMENT OF DEFENSE COMMUNICATIONS MANAGEMENT STRUCTURE

On May 21, 1970, Deputy Secretary of Defense David Packard established the Office of Assistant to the Secretary of Defense (Telecommunications). Mr. Packard testified before the subcommittee that shortly after he took office, he became aware that the Department of Defense had a serious problem in the management of communications. He found responsibility fragmented and a need for centralized authority and control of resources. He said there was no place where he could learn how much was being spent on communications, and that there was no appropriate means for coordinating the substantial portion of communications under control of the military departments. In order to correct those deficiencies, he established the new office referred to above. That office is responsible for all areas of telecommunications except electronics and telecommunications integral to weapons systems. It will establish telecommunications policy and serve as central point for coordination and review of telecommunications plans and affairs.

Some effort to consolidate communications responsibility at the Office of the Secretary of Defense level was long overdue. The com-

munications management structure, which existed in Department of of Defense prior to establishment of the new office, was confused, overlapping and fragmented. The fragmentation of responsibility and poor management practices have been recognized for years as the following quote from a study of the Defense Communications System, dated February 1967, indicates:

> In summary, the major problems of the Defense Communications structure today are a result of poor management practices. As a consequence, inadequate control and procedural processes weaken the fabric of what should be a close knit communications structure. In fact, there is a serious question as to the extent to which the worldwide communications systems of the DOD can be adequately planned or managed under existing procedures.
>
> Given a set of strong, water-tight principles and procedures for processing communications requirements with proper coordination and validation, and a strengthened management system at all levels, the effectiveness and efficiency of the Defense Communications structure can be increased at little or no cost in additional resources. Strong, aggressive management of DOD communications resources cannot be obtained, however, without the proper mix of people, cooperation between participating elements, dynamic leadership at OSD, JCS and DCA levels and agreement on common goals to be achieved, and the path to take to reach these goals. While organizational changes might make solution of the problems of the Defense Communications structure easier, the inherent weaknesses of the structure can be strengthened only through adequate management and procedural changes.

MILITARY DEPARTMENT ORGANIZATION

The organizational structure of Defense communications is based upon the resources of the military departments. The departments are responsible for engineering, installing, manning and operating Defense communications facilities, including those segments designated DCS, for the Unified and Specified Commands,[1] and their component combatant commands, and for the uniservice logistic and administrative support commands. To carry out these basic communications support functions, each military department has organized a separate communications command in continental United States with field elements located in each commander-in-chief's geographical area of responsibility, i.e., Europe, Pacific, etc. Each of those communications commands is headed by an officer of flag or general rank. They are in the direct chain of command of the military departments and report through the chief of the service and the secretary of the department to the Secretary of Defense. The field elements of the military departments' communications commands perform the necessary communications support function for the Unified and Specified Commands and their combat component commands.

DEFENSE COMMUNICATIONS AGENCY

The Defense Communications Agency (DCA) is a Department of Defense agency, established in 1960 to manage the Defense Communications System (DCS), which was established at that same time. The DCS was formed in furtherance of the Department of Defense Telecommunications Policy Objective of "obtaining maximum possible

[1] Combatant forces of the United States and their direct support are assigned to seven Unified and one Specified Command for the performance of military missions. Forces from each of the military departments are assigned to the commands and are under the full operational command of the commander-in-chief of that command while so assigned. The Unified Commands have missions oriented to a particular function or geographic area while the Specified Command, SAC, is responsible for a strategic offensive missi n.

integration and compatibility of long-line telecommunications systems consistent with military requirements". Prior to that time, each of the military departments had developed, independently, its own communications system designed to satisfy its peculiar military requirements. While those systems were similar, each satisfied different requirements, and largely used different equipment. Thus, there was little capability for interoperation of the systems; and, in many instances, two or more services operated duplicate facilities at many points throughout the world. In an effort to reduce communications costs, to eliminate such duplicate facilities, and to improve the responsiveness of long-distance communications, it was decided to integrate, within the DCS, the long-distance facilities of the military departments (the so-called strategic communications) into a "single worldwide complex consisting of all long-haul, point-to-point communications facilities, personnel and material within the Department of Defense". That decision had no effect upon tactical communications which remained under the exclusive control of the military departments.

Testimony before the subcommittee reflects that, at present, about 25 percent of the total communications assets of the Department of Defense is designated as DCS facilities. Another 25 percent is tactical communications supporting field units, ships and aircraft. The remaining 50 percent, described by the Director, DCA, as "nontactical and non-DCS", includes post, camp and station communications facilities, air-ground and ship-shore communications, Army area communications systems and some intelligence networks.

The Director, DCA, under the Joint Chiefs of Staff, exercises operational direction [7] of operating elements of the DCS and exercises management control [8] over those research and development, planning, engineering and programing activities of the military departments, unified commands and other Department of Defense agencies of those areas of endeavor which directly support the establishment and progressive improvement of the DCS. In addition, the Director, DCA, is responsible for obtaining the maximum economy and efficiency in the allocation and management of DOD long-haul, point-to-point communications resources. According to the testimony of the Director, DCA, his direction of the operating elements does not encompass command of the DCS operating facilities.

The military departments have been assigned responsibility for the operation of the DCS, including the provision and maintenance of its facilities, the training and assignment of personnel, the supply and service of the facilities and all other actions required to provide the actual communication service. The military departments are also responsible for engineering, procurement and other activities incident to the expansion or improvement of the DCS. Thus, while DCA exercises operational direction of the operating elements of the DCS,

[7] Operational direction is defined in the DCA Charter as the authoritative direction necessary to ensure effective operation of the DCS. It includes: authority to direct the operating elements of the DCS, assign tasks to those elements, and supervise the execution of those tasks; reallocation of DCS operational facilities to accomplish DCA's mission; establish and prescribe a single set of standards, practices, methods and procedures for the performance and operation of the DCS, and analyze the system performance and operation of the DCS.

[8] Management control as defined in the DCA Charter means authority for the direct supervision, coordination and review and, within approved programs, the continuing supervision, review and guidance to achieve the management objectives outlined in this directive.

has no authority over the personnel and facilities which comprise e DCS, since those are all controlled by the military departments.

OFFICE OF THE SECRETARY OF DEFENSE

Before establishment of the Office of the Assistant to the Secretary Defense (Telecommunications) in May 1970, overall communicaons policy direction and resource management were exercised by rious elements within the staff of the Secretary of Defense. Four sistant secretaries of Defense and the Director, Defense Research id Engineering, each had responsibility for a portion of communicaons management which was divided among those offices along nctional lines. Such functional organization was not appropriate for ie management of communications, since each office performed only s own functional responsibility, with the result that communications as not considered as a system requiring integrated and unified conderation and a corporate management. While the office of the Assistnt Secretary of Defense for Installations and Logistics was designated s the "staff focal point" for communications, there were many ommunications functions over which that office had no authority, e.g. ommand and control communications, which was within the authority the Assistant Secretary for Administration. Instead of a single fice with authority to coordinate all communications activities rried on by the military departments and DCA, portions of those tivities were supervised by numerous offices within the OSD staff. hose fragmented and overlapping responsibilities resulted in inefficnt and ineffective communications management throughout the epartment. For example, the Department did not have readily vailable such elementary management information as its total ommunications costs and its total communications resources. This id other examples of those loose management practices will be iscussed in the following sections of this report.

COST OF COMMUNICATIONS—$3 BILLION OR $6 BILLION?

The Department of Defense estimates of its annual communicaons costs in recent years possibly have missed the mark by as much s $3 billion. Since no formal system of accounting for communicaons costs was maintained until 1969, the Department was unable to pply any firm figures for those costs. In the absence of firm figures, ie Department furnished congressional committees with what it rmed "approximate levels of expenditures". Those figures varied idely among different Department of Defense witnesses. For example, is subcommittee took testimony from two witnesses concerning ommunications costs. Deputy Secretary David Packard testified that ie estimated costs for fiscal years 1970 and 1971 were $2.31 and 2.25 billion, respectively, while Mr. Thomas Moran, Deputy Compoller, Department of Defense, placed those estimates at $2.75 and 2.51 billion for the same years. In November 1969, Secretary of Defense Melvin Laird, in testimony before the House Appropriations ommittee, placed the fiscal year 1970 estimate at $3.06 billion. hose discrepancies were explained by Deputy Secretary Packard as llows:

* * * The figures, I think that I submitted in response to your question, were little higher than this * * * I think they are. That simply reflects the fact

that the figures have been refined since the time we put them together here in December. But again, I can't assure you those would be within a couple hundred million dollars to be correct. It is on the low side anyway. It is because the budgeting and financial control system does not bring all of the costs in the Department that relate to telecommunications together in any orderly, systematic manner. That is one of the things that is going to have to be fixed.

Subsequently, the hearings disclosed that, in furnishing those figures, the Department of Defense was only reporting about half of its overall communications expenditures. That fact was disclosed by the testimony of Mr. Moran that those figures were only for "classical communications" costs. He explained that classical communications excluded command and control communications and those communications delivered with a weapons system. Some idea of the impact that exclusion of those items has upon the total expenditure can be gleaned from the following testimony of Mr. Moran:

Mr. LALLY. Mr. Moran, if the command and control communications and communications in support of weapons systems were included within the overall cost of the Department of Defense communications, do you have even an approximation of what this figure would come to?

Mr. MORAN. If you included all the command and control functions, and the communications supporting command and control, along with the classical communications I have given you, it would increase that number in 1971 by $3.178 billion.

Mr. MOLLOHAN. You mean it would increase it by that amount or to that amount?

Mr. MORAN. It would increase it by that amount.

Mr. MOLLOHAN. By that amount.

Mr. MORAN. In other words, we have $2.515 billion and $3.178 billion, or roughly $5.7 billion.

Mr. MOLLOHAN. In other words, we have $5.700 billion a year of cost in our communications system in the Department of Defense?

Mr. MORAN. In command, control and communications. Now when you get into command and control, I might explain a bit for clarity. Of that $3.178 billion in command and control, $1.321 billion is military salaries and wages. You see these are not communicators in the classical sense, they are people who staff the command headquarters.

Mr. MOLLOHAN. That is a cost of communications though?

Mr. MORAN. Command and control, yes, sir. And you have about $1.363 billion of operations and maintenance costs. That is to maintain the building, and the terminal devices, and salaries of civilian people.

Mr. MOLLOHAN. But all of this is a legitimate assignment of costs to the field of communications?

Mr. MORAN. To the field of command, control and communications.

Mr. MOLLOHAN. You couldn't have communications if you didn't have officers and men to staff it.

Mr. MORAN. Many of these people I think at the command headquarters are carrying out functions other than communications.

Mr. MOLLOHAN. Then what you are giving us is an outside cost figure?

Mr. MORAN. I believe this is an outside cost figure, yes, sir. I want to add again I still have excluded from this communications delivered with a weapons system. That would be the communications on board of a ship and, as you know, that is substantial.

Mr. MOLLOHAN. Do you have a rough estimate of those you could give us?

Mr. MORAN. I don't have an estimate on that, I am sorry.

In view of the inability to even approximate the cost of communications delivered with a weapons system, except for Mr. Moran's statement that it would be "substantial", it appears that an estimate of $6 billion for total communications costs is much more realistic than the $3 billion figure usually cited by the Department of Defense officials.

Notwithstanding the installation of an accounting system for communications in 1969, the witnesses were unable to offer much

ıcouragement for improvement in the near future. Mr. Packard said, We are putting the figures together for the 1972 budget as accurately s we can, but I don't want to give this committee the impression ıat we have precision yet". Mr. Louis deRosa, Assistant to the ecretary of Defense for Telecommunications, indicated that his new ffice will not be equal to the task for some time. He testified that he ıd been unable to locate personnel to staff his resource management ection, and as a result will be handicapped in attempting to review ıe communications budget submissions of the military departments. Ir. deRosa testified that the "major difficulty will come in inability) break down, for example, how much of the O & M funds (operating ıd maintenance funds) are going to communications * * * so if it considered economical to do this, it would still take several years to ıt the services to conform to a new budgeting procedure designed to reak out these returns."

Loose management practices in the Department of Defense resulted ı a complete loss of control over communications assets. It is impera- ive that such control be established if any significant improvement is) be expected in any phase of communications management. In order) accomplish that control, the resource management function of the ffice of the Assistant to the Secretary of Defense for Telecommunica- ons should be staffed as expeditiously as possible, and it should be irected to conduct an intensive effort to identify all communications osts in the current fiscal year. That identification should include all xpenditures for procurement, operation and maintenance, and esearch and development for the DCS, tactical communications, non-DCS and nontactical", command and control communications, s well as communications delivered with a weapons system. Such isibility of communications resources is an essential preliminary step) effective management.

WEAKNESSES OF DIVIDED MANAGEMENT RESPONSIBILITY FOR DCS

According to its charter, the mission of the Defense Communica- ons Agency is to "ensure that the Defense Communications System ill be so planned, engineered, established, improved and operated as) effectively, efficiently and economically meet the long-haul, point- o-point telecommunications requirements of the DOD" and to obtain the maximum economy and efficiency in the allocation and nanagement of DOD communications resources". In performing that ission of DCA, the director has been delegated authority to exercise nanagement control and operational direction of the operating ele- ents of the DCS. Since the DCS stops at the mainframe of bases, osts, camps and stations, the authority of DCA stops at the same oint, a point considerably short of the total nontactical communica- ons system of the Department of Defense.

While granting that apparently broad management authority to ıe DCA, and its director, the charter provides that the Secretaries of ıe military departments shall be responsible for exercising operation ıd maintenance management of the facilities and resources that are ssigned in support of, or related to, the DCA. That separation of nanagement responsibility has had a serious impact upon the effective ıd efficient operation of the DCS. All communications resources, in- luding those designated DCS, are the property of the military depart-

ments. And all operating personnel, including those assigned to the operation of DCS facilities, are controlled by those departments. The net effect of that divided responsibility is that instead of a system, there is a conglomerate of Army, Navy, and Air Force facilities, designated DCS, over which DCA has little, if any, authority. Moreover, the military departments control the purse strings of the DCS in that they furnish the funds for the procurement of equipment and supply the manpower for engineering, construction of stations and installation of equipment. It is possible for funds programed for the DCS to be reprogramed unilaterally by a military department to other purposes without approval from DCA.

One example of the poor results of that divided management responsibility is found in the poor performance of the DCS AUTOVON system. AUTOVON is the DCS automatic voice network, a telephone system containing preemption equipment which permits high priority users to seize circuits actually being used by other callers when circumstances demand such action. Of more than 17,000 AUTOVON access lines, some 6,000 have some preemption capability with about 4,000 having preemption capability through the flash category call. It was intended as a command and control system, but it is also used for general administrative purposes. At its inception, the investment cost for AUTOVON was estimated at $46 million. Through fiscal year 1971, however, the investment cost had exactly doubled to $92 million. The annual operating cost for AUTOVON in fiscal year 1971 was $129 million. Throughout its brief history, AUTOVON has been plagued by a poor completion rate. Less than half the AUTOVON calls initiated can be completed.[9] The cause of that poor completion rate was identified long ago as an inadequate number of access lines from subscriber locations to the AUTOVON terminal points. The access line inadequacy prevents call completion in two ways—by not permitting the caller to obtain access to the system or, once having gained access and his call having traversed the system, by not permitting its egress to the party called. Since the military departments, which are responsible for the leasing of access lines, have been unwilling to subscribe for the required number of those lines, DCA has been unable to improve the responsiveness of the system. General Klocko testified that his authority to improve AUTOVON, as with other DCS systems, is limited to suggesting that the military departments acquire the requisite number of lines. When they rejected his suggestion, he presented the issue to the Joint Chiefs of Staff, who sustained the position of the military departments, and directed him to study the possibility of a reconfiguration of the existing access lines in order to improve efficiency. He testified that the reconfiguration study has been completed, and he is now working with the services attempting to persuade them to reconfigure their access lines.

General Klocko candidly admitted that he regarded his lack of authority to direct the acquisition of desired equipment and operation of that equipment as a weakness in the DCA management structure. He testified that he believed a proposed revision of the DCA charter, extending the DCS to end facilities, e.g. telephone exchanges, local base distribution exchanges, on-line computers, etc., would improve DCA management. His answers to the following questions illustrate,

[9] As a basis of comparison, the commercial Direct Distance Dialing system and the Government's Federal Telecommunications System each average about 75 percent call completion.

however, that the proposed revision would have little effect in improving his authority.

Mr. MOLLOHAN. But the question we are trying to get the answer to is whether or not, under this revised charter authority so far as you are concerned, you will not have this decision?

General KLOCKO. No, sir.

Mr. MOLLOHAN. You will not have it?

General KLOCKO. I will not have it.

Mr. MOLLOHAN. In other words, this does not change your posture in any sense in regard to your making this kind of a decision?

General KLOCKO. That is correct. As far as the decision. But where I stand now, I don't even make a recommendation. I don't even think about PBX's.

Mr. MOLLOHAN. Then what this change really does is make it possible for you to present your view?

General KLOCKO. It makes it possible for me to think about it, and to put in recommendations, to work with the departments on problems associated with this type of equipment.

Such a limited change would do little to improve the management problem which exists in the AUTOVON and the other systems of DCS. The heart of the DCA management problem was succinctly stated by General Klocko as follows:

When it comes to ordering the departments to do things which cost money, this always gets sticky because they have certain statutory rights on the handling of their funds which is hard to circumvent.

Unless DCA is granted that authority, it will not be able to exert sufficient impetus to improve management of the DCS.

Another example of an effect of the divided management responsibility is the lack of DCA authority over the DCS facilities and operating personnel. Those facilities and personnel are all under the authority of the military departments. DCA has no authority over the selection, training and assignment of operating personnel assigned to DCS facilities, nor does it have any authority to evaluate the performance of personnel or the facilities. That point was brought out during General Klocko's testimony when Chairman Mollohan asked:

May I ask you specifically, do you have any role at all in the education or training programs for the personnel who are to man these systems?

General KLOCKO. No, sir. Directly, no. If we find that there are deficiencies in the training, this is part of the management control I mentioned earlier that I would mention to the Military Department or to JCS. Primarily to the Military Department.

Mr. MOLLOHAN. But you do not prescribe any course which they should take?

General KLOCKO. No, sir.

Mr. MOLLOHAN. This is the responsibility of the separate commands?

General KLOCKO. That is correct, sir.

As a result of the flagrant errors attributed to DCS personnel during the transmissions to U.S.S. *Liberty*, Admiral Fitzpatrick was interrogated concerning disciplinary measures which DCA could take against DCS facilities or operating personnel whose performance was substandard. His testimony reflected that no action could be taken by DCS:

Mr. LALLY. That is the question I had. The JCS, as I understand your previous testimony, would be unable to take any action against the Army station if they "flubbed" this message, is that correct?

Admiral FITZPATRICK. That is correct.

* * * * * * * *

Mr. LALLY. Could the DCS take action?

Admiral FITZPATRICK. No, sir.

* * * * * *

Mr. LALLY. But when an investigation determines a deficiency in a particular communications area, no authority except the military department involved can take action against the particular person or station who is deficient?

Admiral FITZPATRICK. That is correct. So consequently, if there is a deficient performance, the director of the DCA, for instance, or one of his earlier commanders, would bring this to the attention of the military department who had the O&M responsibility for the operation of that station, and that commander would take the necessary action, not only to correct it, but to institute disciplinary procedures where that was necessary.

* * * * * * *

Mr. MOLLOHAN. What you are saying is that DCS does not have any direct authority over the various components of its system.

Admiral FITZPATRICK. They do not have authority currently, might I add. They do not have authority to tell the Army or the Navy or the Air Force, "You will spend money, you will assign personnel, you will use your resources to do this." It is against the law.

DCA's lack of authority to direct military department action for improvement of the DCS, and its inability to direct disciplinary action against operating personnel, whose errors have caused DCS to perform poorly, are symptoms of the management weaknesses which make it an impotent organization. Its authority has not been sufficient for management of DCS as a system. Consequently, the DCS has been unable to function efficiently as a system; it is merely an association of facilities tied together and attempting to act in concert, but with no central authority to direct its actions.

Mr. deRosa testified that he thought that the Director, DCA, should be authorized to train operating personnel, and to evaluate their performance, as well as the performance of the DCS facilities. He frankly admitted, however, that no action had been initiated to grant that authority to the director. It appears that no action will be taken as the following testimony of Deputy Secretary Packard indicates:

I think the basic structure in which the services are responsible for providing the forces, including the maintenance of the forces, is an appropriate configuration, and I don't see the likelihood of making a change that would not involve some much more complex problems and difficulties than we have in trying to utilize the services and keep them under effective control.

Witnesses who testified during the hearings generally agreed that establishment of the DCS and DCA had produced a significant improvement in long distance Department of Defense communications. From our examination, it is obvious that strengthening the management of the DCS can bring about another significant improvement. The cost of that improvement would be the relinquishment by the military departments of their responsibility for operation and maintenance management of the DCS to DCA. If the DCS is to function as a system rather than as a group of associated entities, it is essential that the entire operation be managed by a single authority. The objectives of an effective, efficient, economic system established by the DCA charter can only be accomplished by such centralized management. If the military departments are unwilling to cede their DCS management authority to DCA, then the Secretary of Defense should consider the alternate possibility of abolishing DCA and designating one military department as the action agency for overall operation of the DCS. In any event, immediate steps must be taken to improve the management of DCS by the designation of one organization with complete responsibility for effective management of the system.

WEAKNESSES IN DCA ENGINEERING STAFF

The engineering responsibility for the DCS, like most other responsibilities of that system, has been divided between the DCA and the military departments. DCA has been assigned responsibility for engineering the DCS as a system while the military departments have been assigned the tasks of "detailed engineering in support of DCS" and "performing installation engineering". General Klocko testified that the military departments are responsible for engineering the subsystems such as AUTOVON and AUTODIN while DCA has the responsibility of engineering the entire system of the DCS.

In 1963, the DCA engineering office, known as DCEO was established. That office soon became involved in the preparation of detailed engineering specifications for various equipments being procured for DCS subsystems. In some cases, DCEO drafted the detailed engineering specifications, while in others it reviewed and approved specifications which had been drafted by personnel of the military departments. During the subcommittee's investigation, five procurements which were based upon specifications either drafted or approved by DCEO were examined. In each of those procurements, deficiencies in the specifications resulted in products which were unusable. Actions taken to correct the deficiencies resulted in substantial cost increases and long delays in production of the equipment. A short summary of each of those procurements follows.

PROCUREMENT OF DIGITAL SUBSCRIBER TERMINAL EQUIPMENT

Each subscriber to the AUTODIN subsystem requires terminal equipment to obtain a means of system ingress and egress. This terminal equipment consists of a common control unit, similar to a small computer, and paper tape and card input/output devices. Such terminal equipment had been leased from manufacturers until an economic analysis conducted by DCA demonstrated that substantial savings could be realized through Government procurement of the terminals. Although terminals were commercially available for purchase as well as lease, DCA drafted detailed engineering specifications for Digital Subscriber Terminal Equipment (DSTE) which would satisfy subscriber needs.

In June 1965, a fixed-price contract was awarded General Dynamics Electronic Division for procurement of 1,046 terminals at a cost of $45 million. The procurement was supervised by the Department of the Army. Delivery of the equipment was to commence in April 1966 and to be completed by November 1967.

By summer 1966, it was learned that the terminals, being manufactured according to the DCA specifications, were unacceptable. Since the prime emphasis of the specifications involved the security of the equipment, the contractor produced terminals enclosed in cabinets that were too large and heavy; they did not allow convenient access for operation of the equipment and for maintenance. As General Klocko described it, "There were some major mistakes made, particularly in the case of the DSTE, where the specification was applied by the contractor in a way which made an unworkable piece of equipment, and it turned out that, although it complied with the specifications, it was unusable to all intents and purposes". The contractor

was ordered to stop work and the specifications were reviewed by a board composed of representatives of DCA and the military departments. The board concluded that "the Government appears to be basically at fault for allowing such a series of encapsulated equipment to have approached the production stage." It further found that there was inadequate coordination and exchange of information among the various Department of Defense offices involved in the program. That board believed that coordination of all of the interested agencies could have prevented production of the inoperable equipment. The original specifications were then modified and the efforts of the contractor were redirected. The cost of that modification and redirection was approximately $30 million, thus increasing the unit cost from about $43,000 to $73,000 each. In addition, the initial delivery date was set back to December 1968. Delivery under the contract had not been completed at the time of General Klocko's testimony before the subcommittee in September 1970. Other contract modifications had increased the contract price to $79 million by September 1970. In addition, there were contractor claims arising from the contract totaling about $5 million. Thus, the total cost of the DSTE is now about $84 million, roughly an 86 percent increase over the original contract price.

General Klocko testified that less than half of the finished terminals which have been delivered are being used by subscribers. The remainder are being stored at a signal depot. He admitted that many of the Department of Defense subscribers prefer to continue using commercial terminals they leased while the procurement of DSTE lagged. He attributed subscriber reluctance to replace their leased equipment with Government-owned terminals to the greater versatility of the leased equipment, which is able to perform more functions than the Government-owned DSTE.

AUTOMATIC DIGITAL SWITCH PROCUREMENT

A fixed-price contract for procurement of 11 automatic digital switches for the Defense Special Security Communications System was executed in July 1966 with International Telephone & Telegraph for $6.9 million. By early 1967, National Security Agency determined that the switch being manufactured according to specifications which had been prepared by Defense Communications Agency and approved by Director, Defense Research and Engineering, would not satisfy the operational requirements of its user. The inadequacy of the switch was described by General Klocko in the following testimony, "I would say that the major problem was in working out this requirement in translating this requirement into the actual specification, and the engineering involved with this procurement". He further admitted that the engineering specifications were defective and that the responsibility for their defectiveness lay with the DCA program manager and the DCA engineering staff working with him.

When it was learned that the switch being manufactured was unsatisfactory, an effort was made to revise the specifications to correct the deficiencies. That effort consumed more than a year and it was not until August 1968 that the amendment to the contract was furnished to the contractor. It was soon learned that the contract

price would be substantially increased as a result of the amended specifications.

On August 14, 1968, the contractor was ordered to stop work on the contract. That "stop work" condition prevailed until September 1969 when the contract was terminated. The Deputy Secretary of Defense, in January 1969, ordered the procurement reduced to three switches, if they could be obtained for the original contract price. But the contractor informed the Defense Department in February 1969 that three switches would cost an additional $8.8 million. That proposal was debated by the various Department of Defense offices which were interested in the contract, i.e. Assistant Secretary for Installation and Logistics; Director, Defense Research and Engineering; Defense Communications Agency; National Seucrity Agency; Deputy Secretary of Defense for another 8 months before the decision to terminate the contract was finally reached on September 11, 1969. During that 13-month period, while the various management entities of the Department of Defense sought to reach a decision, the contractor's costs increased by about $2.74 million.

This procurement demonstrated the weakness of the fragmented management of Department of Defense communications, as well as the weakness of the engineering office of the Defense Communications Agency.

MODEM PROCUREMENT

In June 1965, a contract was entered with Hughes Corp. for production of 450 high-speed wireline modems at a price of $1,366,000. A modem is a modulator-demodulator device for converting digital signals produced by data equipment to analog form for transmission via voice frequencies and, conversely, analog signals to digital. The contract provided for delivery to commence in April 1966 and to be concluded by June 1967. Detailed engineering specifications for the modems were drawn by Army and approved by DCA.

Technical problems encountered in the manufacture of the modems set the initial delivery date back to January 1967. During tests of the preproduction models in November 1966, it was learned that the modems being manufactured according to the Government specifications would not satisfy operational requirements. The contractor proposed numerous changes to overcome deficiencies in the engineering specifications at a cost of $659,000. Since there was no assurance that these changes would produce a completely acceptable modem, the contract was terminated.

DCA has advised the subcommittee that 65 modems were produced, but that none of them could be used in operational systems. As an alternative, they have been utilized in an experimental system for the Army. The contractor is claiming $910,000 under this contract which only produced a modem which couldn't be used in an operational system.

In 1969, another contract was entered with Hughes Corp. for production of 218 modems at a cost of $2.5 million.

PROCUREMENT OF SECURE VOICE ACCESS SYSTEM

The Secure Voice Access System is a component of the Automatic Secure Voice Communications System (AUTOSEVOCOM) of DCS.

In order to hasten procurement of that component, a letter contract was awarded Philco-Ford in October 1966 to produce it. The contract price was subsequently negotiated at $9.7 million.

By July 1969, that contract had been modified 49 times. Many of those modifications resulted from deficiencies in the specifications which had been drawn by the Army and approved by DCA. Those modifications had increased the contract price by approximately $9 million, an increase of about 90 percent. DCA's proposed history of the AUTOSEVOCOM system offered a possible explanation for the deficiencies by stating that, "the various AUTOSEVOCOM specifications should have been more thoroughly coordinated with DCA and the other Mildepts by the Army."

AUTODIN SWITCH PROCUREMENT

In furtherance of the DCA plan to extend the AUTODIN system to overseas areas, a contract was entered with Philco-Ford in 1964 for procurement of 11 automatic switches at a price of $31.3 million. The engineering specifications for that switch were drafted by DCA. A subsequent increase in quantity to 13 switches increased the contract price by about $6 million. By September 1970, however, the cost of those switches had increased to $62.5 million, a 100-percent increase over the original contract price. General Klocko testified that contract changes were largely responsible for the increased costs. He further stated that several of those contract changes were necessary because of deficiencies in the engineering specifications.

The inadequacy of the DCA engineering office has been recognized by the Department of Defense. Mr. deRosa, Assistant to the Secretary of Defense for Telecommunications, when asked to furnish an appraisal of that staff, indicated that he believed it needed improvement. He stated:

> I have recognized that the drawing up of specifications is one of the weaknesses in our procurement processes. I talked several times with the program people who are in charge of the programming, working with DCEO, which is our engineering branch, and have told them to look into the problem to see whether we are properly drawing specifications. Whether we are drawing them in too much detail or not enough detail, it could be either of these.
>
> I haven't yet put a fix on the drawing up of specifications. As you recognize it is a very, very difficult thing to do, to draw up a specification which a contractor can take and produce exactly what is required.

SYSTEM ENGINEERING FACILITY

In 1969 DCA established an additional engineering office, System Engineering Facility (SEF), to discharge its responsibility for conceptually engineering the future DCS. The authorized strength of SEF for fiscal year 1971 is 121 persons with an ultimate strength of 147. DCA has estimated the total investment cost for SEF will be approximately $7.8 million, and that its annual operating cost will be approximately $2.4 million. General Klocko distinguished system engineering, which he identified as the responsibility of SEF, from subsystem engineering, which he identified as the responsibility of DCEO. He further described the mission of SEF as follows:

> Its system engineering talent will generate the essential technical foundation necessary to provide a long-range DCS plan acceptable to the Secretary of Defense. This plan will set forth all the information required to decide what the future DCS shall be, which path of evolution from the present DCS shall be followed, what

research and development must be emphasized, and which transitional improvements of the DCS shall be implemented by the military departments.

My ability to conceptually engineer the DCS of the future will be measured by the ability of this Facility to become current with the state of R. & D. performed by the military departments and industry, to forecast accurately what is technologically feasible 10 years from now, to apply this knowledge effectively and efficiently to the design of a system responsive to future user requirements, and to technically describe the transitional paths spanning the next 10 years.

* * * * * * *

This team effort will ensure complete understanding of today's system and its shortcomings, the military departments' ongoing R. & D. programs, future user requirements, and concepts to fulfill these requirements. It will ensure compatibility among future system engineering. Further, it will ensure that planning sequences likewise are compatible, and that subsystem plans and implementation plans for near-term improvements to the DCS are in accord with the Secretary of Defense's selected evolutional scheme.

It would appear that a system engineering plan should have been the basis for the DCS at its inception. The failure to develop such a plan before constructing the DCS has no doubt contributed to some of the problems of the system. Although it appears that the major subsystems have been substantially completed and are now operating, a system plan should be developed in order to ensure that the future DCS will be better planned and more responsive to the requirements of its users.

According to the testimony of Mr. deRosa, system engineering is a highly specialized area of communications which requires a staff with wide experience. He questioned the ability of the SEF staff to perform that function. He said that he believed half of the staff presently employed at SEF did not possess the qualifications for system engineering. He went on to say that it would require a training period of 3 years in order to qualify those people. And he further testified that he believed it would be difficult to recruit additional people who are qualified system engineers because of the salary limitation at SEF.

Mr. deRosa testified that his concept of the function of SEF differed from that of General Klocko. Because of the limited capabilities of the staff in the field of system engineering, Mr. deRosa testified that he thought that SEF would be a group of highly technical project managers rather than system engineers. He stated his view of the function of SEF as follows:

I would like to see it perform a monitoring function rather than a complete, self-contained engineering facility. For the reason I mentioned before, that is to say it is extremely difficult to get one organization with the depth of competence in each of the required technologies necessary to be able to handle everything.

The subcommittee also noted that the establishment of SEF has not eliminated DCA need for contractor support in the field of system engineering. Moreover, Mr. deRosa testified that he did not believe that requirement could be eliminated even after SEF is fully operational. In fiscal year 1970, more than $3.7 million was obligated by DCA for contractor support, and in fiscal 1971 over $2.2 million has already been obligated. Those figures are a considerble increase over the $1.6 million obligated in fiscal 1968 and $3 million obligated in fiscal 1969. The steady increase in contractor support costs for system engineering appears to confirm Mr. deRosa's belief that SEF will not provide a complete in-house system engineering capability.

An objective evaluation of the entire DCA engineering structure is indicated in view of the poor record of the DCA engineering staff in

drafting specifications for procurements, and the questionable capability of the SEF staff. That evaluation should determine whether there is a need for DCEO or whether that function might be performed more capably by the military departments. If it should be found that a need exists for a DCA engineering staff, the function of that staff should be clearly defined and each of the current staff members should be evaluated to determine whether he is qualified to perform the tasks for which he was hired. That evaluation should also examine SEF, its function and its staff. Since half of the staff currently assigned to SEF is not qualified to perform system engineering, thereby requiring continued dependence upon contractor support in that area, there is a serious question whether the appropriation of additional funds for SEF is justified. It appears that the system engineering task might be assigned to one or more of the military departments, thereby eliminating the large appropriations which will be necessary over the next several years for the establishment and completion of SEF.

IN-STATION PROCESSING IMPEDES SPEED OF SERVICE

The Department of Defense has established four precedence categories for the messages transmitted in its systems. Those precedences, in diminishing order, are: flash, immediate, priority, and routine. One of those designations is assigned to each message by the sender, indicating his desired speed of delivery. The precedence designation guides communications system personnel in the processing, transmission and delivery of all messages. The rule in all Department of Defense communications facilities is that messages are handled on a first-in-first-out basis in the order of the precedence assigned.

Speed of service objectives have also been established for the transmission of messages in each of the precedence categories. The "flash" category has an objective of 10 minutes; "immediate" has an objective of 30 minutes; for "priority", the objective is 3 hours; while the "routine" category has an objective of 6 hours. During his testimony in March 1970, General Klocko, Director, DCA, testified that the DCS AUTODIN subsystem not only met but improved upon those speed of service objectives. He testified, "The average message handling time is 11 minutes—ranging from 2 minutes for flash messages to 20 for routine traffic." During his later appearance, it was determined that the Director was referring to the time elapsed from the introduction of a message into an AUTODIN switch until that same message is received at the switch serving the addressee of the message. Those figures do not consider the time elapsed from the filing of the message at the initiating communications center until the time it is available for delivery at the terminal serving the addressee. This latter period, the writer-to-reader time, appears to be a more valid measure of the effectiveness of the communications system, since the additional time so consumed is substantial. A comparison of both measures is found in the DCS Communications Management Handbook for the 2d quarter calendar year 1970. Statistical charts in that handbook reflect that, during the first half of 1970, the average elapsed times from switch to switch for each of the precedence categories were: Flash, 5 minutes; immediate, 8 minutes; priority, 15 minutes; and routine, 26 minutes. Another chart reflected, however, that, during that same period, the average time elapsed from the filing of a

message until it was available for delivery in each of the categories was: Flash, 69 minutes; immediate, 1 hour, 40 minutes; priority, 2½ hours; and routine, 3½ hours. Thus, the average time elapsed from writer to reader in 1970 was from 8 to 13 times longer than the electronic transmission time of those messages. That chart also reflected little, if any, improvement when the 1970 times were compared with the same period in 1969; in fact, the only significant change was a degradation in the flash precedence where the average elapsed time in 1970 was more than double what it had been in 1969.

The elapsed time beyond that required for electrical transmission was described by General Klocko as processing time. Processing includes preparation of the message for electrical transmission, encryption, if necessary, and any waiting time resulting from a message backlog in its precedence category. Similar processing is required at the receiving station in order to properly format the message for delivery to the addressee.

The time required for processing messages has been a problem in Department of Defense communications for a number of years. According to the testimony of Mr. deRosa, little progress has been made during that time in correcting the problem. He testified that he was aware of studies of in-station processing time, which had been conducted 10 to 15 years ago, but that "the problem is no better solved 10 or 12 years afterward".

Subcommittee witnesses had testified that the processing time, experienced during the 1967 transmission to U.S.S. *Liberty*, would be reduced today by (1) the conversion of manual relay stations to automated equipment, and (2) the installation of optical character readers and other equipment that would eliminate manual processing. Those predictions, however, appear to be contradicted by the statistics reported in the DCS Communications Handbook, cited above, which do not reflect any significant improvement during the first 6 months of 1970. One of the factors which appears to have hindered improvement of processing time is that the problem has not been approached on a system basis. The attitude in the Department of Defense appears to be that processing time is a problem of the individual military departments rather than DCA. The following interrogation of General Klocko, Director, DCA, exemplifies that attitude:

> Mr. LALLY. Well, have any speed of service objectives been established by DCA for processing time in message centers?
>
> General KLOCKO. That is not done necessarily by the communicator. In other words, they are working as fast as they can. Pardon me, it is done by the communicators, but it isn't something that we can control very well.
>
> This is a matter of the precedence which is put on, and how much traffic there is in the center at the time, in preparation portion of the communication center.
>
> Mr. LALLY. Well, since the processing time has added so much to the time for getting the message through, isn't there any concern on the part of the Defense Department to improve this processing time?
>
> General KLOCKO. On the part of the military departments. Remember, we are talking about a terminal here, which is not a portion of the DCS. The military departments are constantly confronted with this problem.

It is clear that the military departments have failed to make any significant reduction of processing time by their independent approaches to the problem. It appears that a significant reduction can be effected only by centralizing the responsibility for improvement in one entity rather than the several which now share that responsibility.

The Office of the Assistant to the Secretary of Defense (Telecommunications) appears to be the logical point for that coordination of the efforts of all Department of Defense communications facilities. That official should be able to exert sufficient control over the various communications facilities and thereby solve this problem which has degraded defense communications.

SATELLITE COMMUNICATIONS SYSTEM—VICTIM OF THE DECISION-MAKING PROCESS

The overlapping authority of the several Department of Defense offices sharing responsibility for telecommunications has had a detrimental effect on the development of some systems which are needed by the military departments. An example of such a retardation in development occurred with the Defense Satellite Communications System.

The Director, DCA, testified that in May 1970, authorization was obtained to proceed with the DCA program for an operational satellite communications system. He further testified that the system known as Phase II Defense Satellite Communications System (DSCS) will not attain a full operational capability until about [deleted]. Since commercial systems achieved operational capability several years ago, that schedule places the DSCS at an incredible distance behind the commercial systems. That delay is even more difficult to understand in view of the Phase I R. & D. satellite communications system that DCA has had under development for a number of years. We recognize that the military system must satisfy requirements which do not occur in commercial systems, e.g., transportable ground terminals which can be set up in an unprepared location within a very short time. Nonetheless, it appears that efficient, aggressive management, not only in DCA, but also in the Office of the Director, Defense Research and Engineering, would have permitted the program to keep pace with commercial developments.

When Deputy Secretary Packard was asked to explain why the satellite communications program was so retarded, he said:

> Well, I think the answer to that is that we just have a relatively clumsy decisionmaking process in a great many areas there. Frankly, I am very concerned that we have all sorts of programs that so many people will have to get into the decisionmaking, it takes us a year or two or longer to make as good a decision as we should.
>
> I don't know whether we can get an improvement in that process, but that is just the difficulty. You see that system impinges on all of the three services, on the responsibilities of the Joint Chiefs, and by the time you get everybody reviewing the thing, a lot of time has gone by. I hope we can, by getting an office that is specializing in this business, I hope we can improve that decisionmaking. I am sure that is all it is.

The Deputy Secretary's uncertainty that the Pentagon's decisionmaking process can be simplified is not at all reassuring. The delay which occurred in the satellite communications program should not be permitted to recur. The centralization of communications authority in the Office of the Assistant to the Secretary of Defense for telecommunications should result in a reduction of the time needed to approve a communications system. This subcommittee is particularly interested in that problem since it will again be faced in the TRI-TAC and TRI-SAT programs of the Department of Defense. Both of

those programs, one for a unified approach to tactical communications equipment, and the other for a unified tactical satellite communications system, involve all military departments, as well as several Department of Defense offices and agencies. If they should experience the same delays in decisionmaking that the DSCS program did, they will fall far short of the target dates for their operational capability.

DEVELOPMENT OF COMMUNICATIONS SPECIALISTS

Modern military communications, and particularly those systems comprising the DCS, utilize complex electronic equipment. Because of that complexity, the development of an expertise in the field of communications requires years of training and experience. Such specialized, technical experience, however, receives little consideration from military promotion boards when officers are evaluated for promotion, particularly to the flag or general ranks. Those boards prefer officers possessing broad experience with emphasis on command of tactical units. For that reason officers who are interested in advancing their military careers have been unable to devote the time necessary for the development of a specilization in the communications field. Although some communications specialists have attained flag or general officer rank, they are the exception. As a result of those promotion practices, few of the flag and general officers who have been assigned to top management positions at DCA have had the opportunity to develop the proficiency in communications which is necessary for the supervision of a communications system. Assistant to the Secretary of Defense deRosa, in discussing the paucity of communications specialists in the higher ranks, said:

> I am sometimes amazed at the proficiency that I find on the part of a few general officers in communications who have managed to refute the general rule that you can't get along in a specialized function such as communications and intelligence. * * * There are isolated cases where people have gone ahead; but, in general, one finds his best way of progressing is to be an all-around type of officer rather than a specialized function.

Mr. deRosa suggested that the military departments should initiate programs for the development of communications specialists in order to satisfy their requirements for such officers. The subcommittee adopts that excellent suggestion and adds the recommendation that those career development programs for communications officers should be established immediately. In order that the military careers of officers who elect to specialize in communications will not be jeopardized, the military departments' promotion boards must give equal weight to such training and experience when evaluating officers at all promotion levels. The development of such a specialist corps should improve the military communication structure throughout. Such a program would also insure that the flag and general officers assigned to DCA would possess the proficiency required for effective management of the DCS.

INTRODUCTION OF CIVILIAN MANAGEMENT INTO DCA

DCA was organized along military lines and has continued as a military organization. Its charter provides that the director, vice director and the deputy directors shall all be flag or general officers.

The military structure has been adhered to because communications have always been regarded as a prerogative of the military commander and must be maintained under his control. While the organization of DCA has worked reasonably well, there are some inherent weaknesses in placing a technical function such as communications under military management. The most prominent weakness noted in DCA was the need for more technical proficiency at the higher management levels.

The preceding section of this report noted that the military departments were not developing enough officers who were proficient in all aspects of communications. The absence of such a specialist corps has been most pronounced in the flag or general officer ranks, as few specialists attain those ranks primarily because of their specialization. As a result of that selection process, many of the officers assigned to the top management positions at DCA have not possessed the technical proficiency which is essential for the effective and efficient management of a major communications system. While most of those officers have had some communications experience, it has largely been incidental to their military advancement, thus they are lacking in the expertise which the position demands. Although no causal relationship can be established, there is a suspicion that many of the unfortunate engineering and procurement experiences of DCA might have been averted if knowledgeable communications men had been managing the agency. It also appears that, unless DCA can obtain a management which is communications oriented, it is doomed to repeat its prior mistakes. Since a sufficient number of flag and general officers with the communications proficiency necessary to satisfy the needs of DCA are not currently available, it is believed that some civilian communications experts should be introduced into the management levels of DCA. That proposal was supported by the testimony of Deputy Secretary of Defense Packard and Assistant to the Secretary of Defense for Telecommunications deRosa. The opinions of those men are particularly valuable in this area since both have had many years of experience in the communications and electronics fields.

According to the testimony of Mr. deRosa, it has been difficult for him to determine the communications proficiency of the incumbents in the top positions at DCA. He stated that "their record indicates a reasonable exposure to communications and it is difficult to determine their proficiency in the field from their record". He further stated that he has recommended to Secretary Packard the assignment to DCA of

> * * * more civilian communicators in the top positions. At the vice director level, it would be quite valuable to have a deputy who had made a career of communications as a civilian and who would maintain continuity over many periods of time in the same way that the Deputy Director for NSA does there.

Mr. deRosa further recommended that he would prefer civilians as program managers and in the deputy director positions "requiring high technological inputs such as planning and systems operation". Deputy Secretary Packard testified that he believed that infusion of some civilian communications experts would improve the management of DCA. He testified that he was studying the merits of altering the DCA Charter to provide for naming a civilian, either as Director or Vice Director, DCA. In discussing the merits of a civilian director for DCA, Mr. Packard said:

This is a highly technical job, and we ought to have a good, capable person in that assignment, who has training and experience in the business and can stay there long enough to really have an impact on it.

The military policy of frequent rotation of its personnel, referred to by Deputy Secretary Packard in that statement has also worked to the detriment of DCA. This was brought out during the testimony of Mr. deRosa. In discussing the rotation of communications program managers, he pointed out that rotation interferes with acquiring proficiency. He said:

I think one of the weaknesses is the rotation system * * * you can't rotate from one area to the other every three years and become proficient in any area.

Deputy Secretary Packard also expressed some concern about the frequent rotation of specialists. He testified concerning his efforts to overcome that problem, as follows:

We have got a commitment from the service Secretaries and the service Chiefs that they are going to make some changes in their personnel management programs to get better people into these programs, to do a better job of training and leave them in these assignments, particularly the specialty assignments, long enough so they can get an effective job done.

Mr. deRosa also pointed out another practice which does not contribute to improvement of the DCA management. He testified that most of the officers assigned to DCA by one military department are on their terminal assignments. He stated that two-thirds of that department's officers were within 2 years of retirement and that many of them were lacking in communications experience. While that practice might be beneficial to the officer in permitting him an opportunity to contact prospective employers during his terminal assignment, it certainly is not beneficial to DCA. Such assignment practices must cease.

Introduction of some civilian communications experts into the top management of DCA should have a salutary effect on the organization. They would provide the communications expertise, the lack of which appears to have been a factor in some of the DCA engineering problems. Moreover, they would provide continuity to the organization, its plans and programs, since they would not be affected by military rotation. This is not to suggest that DCA should be converted into a civilian organization. We believe that it should retain its military character with a military director and military officers in those positions which do not demand technical proficiency. We believe, however, that a civilian deputy director would be an invaluable asset to the director, since he would possess the experience essential to the operation and future development of a communications system; furthermore, since he would not be subject to transfer every 3 or 4 years, he would be able to bridge the gaps between military directors and could provide continuity to the organization. Similarly, civilians with the requisite technical proficiency should be introduced into those deputy director positions which require a technical background, e.g., plans, operations. Finally, consideration should be given to the use of qualified civilians as DCA program managers. Such an introduction of qualified civilians into management positions at DCA would work to the advantage of the agency in two ways—it would raise the level of technical proficiency of the system managers and it would provide continuity to the management since those individuals would

SURVIVABILITY OF THE DCS

The Defense Communications System provides the principal long lines of communication for supporting the military and political interests of the United States wherever they occur. The DCS interfaces with military tactical communications to provide a communication capability from the White House to the foxhole. Since the DCS provides the principal means for worldwide longhaul communications of the Department of Defense, there is a requirement that it will be capable of performing even when subjected to enemy attack and after it has sustained physical damage. In order to assure the existence of that capability, the DCA periodically performs damage assessment or survivability studies. Those studies are conducted with the aid of computerized damage assessment models to determine the damage each weapon causes at command and communication centers and at various points in the communications system.

Those studies analyze whether a critical user, at his command center, would have the capability of communicating with his subordinates at their field location during the course of and after an enemy attack. An annual analysis is conducted and is supplemented by special studies relating to specific military problems. Those studies have been devoted almost exclusively to an assessment of the impact of nuclear attacks. Mr. Joseph Krcok, Chief of Survivability Simulation, DCA, testified that only one study has been conducted of the effects of conventional warfare upon the DCS. According to Mr. Krock, that study was conducted about 5 years ago and has not been updated. He further testified that the survivability studies have not addressed the impact of sabotage upon DCS facilities in continental United States or elsewhere.

The Department of Defense concern with the effects of a nuclear attack cannot be criticized. The impact of a nuclear attack, however, should not be permitted to obscure the effects that limited warfare or sabotage would have upon the system. Both those conditions are distinct possibilities, and some realistic assessment of their effects is essential if survivability studies are to serve any useful purpose. Testimony indicated that the various studies of the effects of nuclear attack have not produced any significant data changes. Since repeated studies of the effects of nuclear attack are not furnishing much new information, it appears that other attack scenarios should be simulated in order to ascertain their effects. Prudent management of Department of Defense communications dictates that future studies should be devoted to ascertaining the survivability of the system in situations of limited warfare, sabotage and all other probable scenarios which would result in damage to the system.

The simulated studies, which have been conducted, indicate there would be tremendous degradation of the DCS in the event of a nuclear attack. For example, one study conducted several years ago demonstrated that the effectiveness of the two principal DCS subsystems—AUTOVON, the Automatic Voice Network, and AUTODIN, the Automatic Digital Network, would both be greatly reduced. That study indicated that AUTODIN would have [deleted] ability. At [deleted] minutes after an attack, it would be reduced [deleted] of its effectiveness in continental United States and the Pacific areas, while it would be reduced to [deleted] effectiveness

Europe. The United States and Pacific systems would suffer further degradation at later times so that, for all practical purposes, the system would only be capable of transmitting a small percentage of its normal volume. The AUTOVON system would be somewhat more survivable. At [deleted] minutes after attack in continental United States, it would be reduced to [deleted] percent of its effectiveness, while in Europe and the Pacific areas, it would be reduced to [deleted] percent of its effectiveness. While the United States and European systems would continue at about the same rate of effectiveness, the Pacific system would suffer further degradation at a later period. That same study reflected that high frequency radio would be blacked out almost completely for [deleted] hours after an attack, but that after the blackout, it would be restored to about [deleted] percent effectiveness. Those studies assumed that there had been no targeting of communications facilities, but that they had suffered only incidental damage. If the facilities themselves were targeted, the loss of service would be much more severe. The inescapable conclusion of the studies appears to be that the DCS was designed for peacetime rather than wartime operation.

Since the AUTOVON and AUTODIN subsystems constitute the backbone of the DCS, their reduction to the extent indicated by the DCA studies would have a severe impact upon the total Department of Defense communications capability. That impact would be most serious with respect to communications from national command authorities to the unified commands in Europe and the Pacific. Since both those systems utilize sophisticated electronic switches, restoration of optimum service would probably require considerable time, if it could be accomplished under wartime conditions. Consequently, some alternate transmission method would have to be utilized if national command authorities were to exert any influence in a continuing combat situation. In view of the tremendous reduction in the transoceanic capability of the DCS resulting from a nuclear attack, it appears that adequate high-frequency radio systems should be maintained in a standby capacity by DCS to fill the void left by reduction of the voice and digital networks. Admittedly, the limited speed of transmission of high frequency radio restricts its general use in normal DCS operation. Its demonstrated survivability, however, makes it an extremely valuable standby asset which should be maintained in a state of readiness in both transportable and fixed configurations.

PROBLEMS IN SECURE VOICE COMMUNICATIONS

Two of the military witnesses who testified before the subcommittee declared that the greatest deficiency in existing defense communications is the lack of an effective secure voice system. Their criticism was not directed at the security of the systems. It was the voice quality of the AUTOSEVOCOM, the DCA Worldwide Secure Voice System, and the various tactical secure voice systems which was pointed out as the deficiency. The synthesized reconstructed voice was described as having a "Donald Duck" quality, which makes identification of the speaker very difficult. The problem was described by Brig. Gen. Lee Paschall, Deputy Director, Command, Control and Communications, U.S. Air Force, as follows:

[illegible] I think as much as anything. We just don't know how to do

assessment of the problem here is, principally, we need some sort of technological advance that will enable us to do this. I wouldn't limit it to the strategic system or to the tactical system. We all face the same kind of problem.

In subsequent testimony, General Klocko agreed that secure voice was the most critical deficiency in present defense communications. He further testified that secure voice is an expensive technique. His testimony was corroborated by cost figures supplied by Department of Defense. Those figures reflect that the AUTOSEVOCOM costs were approximately $48,000 investment cost, and approximately $8,000 annual operating cost, per subscriber.

Despite its substantial costs, the performance of the AUTOSEVOCOM subsystem has been poor. Testimony before the Subcommittee reflected that only about [deleted] of the calls attempted are completed. That poor completion rate is even more serious than it appears, since AUTOSEVOCOM is limited to a relatively small number of subscribers among the command echelons. Further testimony reflected that the preliminaries to an AUTOSEVOCOM call consume considerable time. When General Klocko was interrogated concerning a 40-minute delay in placing a secure voice call from Commander, Naval Forces Japan, to 5th Air Force at the time of the *Pueblo* seizure, he stated:

> But I would go back to the AUTOSEVOCOM, [3 lines deleted]. And for the you described there, I would say this was a matter of setting up a secure transmission and not of authenticating it.

The technological problem was identified by General Paschall as an easy method of converting from analog (voice) to digital (data) and reconverting to analog so that speech does not have to be synthesized through a device called a vocoder. He further testified that, unless there is some technological breakthrough, an expensive program will probably be required for solution of the problem. Mr. deRosa subsequently testified that, in his estimate, no technological breakthrough was imminent, and that he believed that funding for research and development in the field of secure voice should be doubled.

[7 lines deleted]

The subcommittee hearings clearly demonstrated the need for improvement of the existing secure voice equipments. In view of the urgency expressed by witnesses, the improvement of that equipment should be accorded a very high priority in Department of Defense communications programs. The testimony concerning the recent progress in the development of new equipment was encouraging. However, until that equipment can be deployed, the secure voice problem will continue. The Assistant to the Secretary of Defense (Telecommunications) should initiate an examination of the effort of all military departments and agencies in this field. His examination should determine whether the equipment under development will satisfy the military requirements and, if so, how soon it can be deployed. He should also determine whether the current funding for research and development in the secure voice area is adequate.

PROGRAM FOR CRITICOMM-AUTODIN INTEGRATION

The Critical Intelligence Communications System (CRITICOMM) is a dedicated network operated [deleted] for the transmission of intelligence communications. In addition to its general use, CRITI

COMM was designed with features which assure the rapid transmission to National Command Authorities of messages of critical importance. At the present time [deleted] minutes is the maximum time permitted for the transmission of such information to the decision-making authorities. Testimony reflected that messages designated for this special handling have been transmitted in an average of 4 to 6 minutes over the past several years. Testimony, concerning the transmission of three Critic messages connected with the attack on U.S.S. *Pueblo*, reflected that those communications had been received at the National Military Command Center within 4, 6, and 7 minutes of their transmission.

The CRITICOMM network performed satisfactorily from the time of its inception. It became apparent in the early 60's, however, that the rapidly increasing traffic volume demanded automation of the principal relay points if the system were to continue its efficient transmission. Another defense intelligence communications network, the Special Intelligence Communications System (SPINTCOMM), was also in need of automation at the same time. A plan was devised by the Department of Defense to interface CRITICOMM with SPINTCOMM to permit them to operate in an automatic mode at the switching points, and ultimately, to combine them into the Defense Special Security Communications System (DSSCS). Defense Communications Agency prepared a plan for the development of DSSCS. That plan provided a four-phase program with installation of the automatic switches to occur during the third phase. In September 1969 the contract for procurement of the automatic switches was terminated after considerable difficulty had been encountered during their manufacture (see pp. 27–28 for a description of those difficulties).

When it had become apparent that the switch being procured would not meet the operational requirements of the CRITICOMM System, both National Security Agency and Defense Communications Agency sought alternative methods for satisfying the need for automatic switching. NSA proposed the use of a device it utilized at its headquarters, known as an Internal Data Distribution Facility (IDDF), as a switching device at the nodal points of the system. The Director, Defense Research and Engineering and the Defense Communications Agency proposed that the AUTODIN subsystem be modified in order to permit it to transmit the CRITICOMM traffic. The alternate proposals were examined by the staff of DCA, which rejected the IDDF proposal on the basis of cost effectiveness. According to General Klocko, the DCA study concluded that installation of the IDDF switch would require an increase of [deleted] operating personnel, whereas the AUTODIN modification would permit the use of existing equipment without any significant increase in operating personnel. Consequently, a program was initiated to modify the AUTODIN system to enable it to meet the requirements of NSA.

That program, according to testimony received by the Subcommittee, will cost $24.5 million. It is presently in the conceptual stage and will soon arrive at the point where modified equipment will be procured for the test program. Testimony further reflected that the test program will begin in the latter part of fiscal year 1972 and that, if the tests satisfy the NSA requirements, the modification of the AUTODIN system will be completed by 1973.

The subcommittee witnesses testified that the present CRITICOMM system will be maintained during the test program, and that it will not be replaced unless AUTODIN can satisfy the NSA requirements. Deputy Secretary Packard testified he was convinced that the AUTODIN system had the capability of satisfying NSA requirements, provided that certain problems could be worked out. He stated, however, that his authorization of the program was contingent upon a demonstration that AUTODIN, as modified, could do the job.

Over a period of several years, the CRITICOMM system has proven its value by rapid transmission of vital national security information to the appropriate command authorities. In view of the present international tensions, which give no indication of subsiding, it appears that the requirement for such a rapid transmission system will continue in the foreseeable future. In order to satisfy that requirement, it is imperative that the CRITICOMM system be maintained until an adequate replacement has been thoroughly tested. Accordingly, we believe that no action to phase out CRITICOMM should be initiated until the tests of the modified AUTODIN system conclusively demonstrate that AUTODIN will at least equal the transmission speeds of CRITICOMM. If those tests demonstrate that AUTODIN cannot satisfy those requirements, then a new alternative should be sought. Meanwhile, however, CRITICOMM should be maintained.

SUMMARY OBSERVATIONS

President Nixon eloquently portrayed the critical role of communications in our national defense when he said, "When a war can be decided in 20 minutes, the Nation that is behind will have no chance to catch up." In order to be equal to their task in such a war, communications must have the capability of transmitting intelligence into the National Military Command Center and, conversely transmitting command and control decisions from that center to forces in the field within a very few minutes. This subcommittee's examination of the responsiveness of communications during the *Liberty*, *Pueblo*, and EC–121 incidents, raised a question whether the Department of Defense Communications Systems, generally, and the Defense Communications System, in particular, would be equal to that task. In those incidents, the performance of the Defense Communications System fell far short of meeting that standard. Several witnesses have testified that improved equipment, installed since those incidents should result in better performance today. But despite the continuing programs for improvement of communications hardware, there does not appear to have been a commensurate improvement in the performance of the Defense Communications System, as evidenced by the failure to reduce in-station processing time, and the failure to improve completion rates for AUTOVON and AUTOSEVOCOM. Furthermore, no assurance could be obtained that the DCS would prove more efficient if faced with a similar crisis today. That point was brought out during the interrogation of the Director, DCA:

> Mr. HALL. The clincher is to ask the General one question: Given another scenario like the *Liberty*, are you confident in your own mind that now we would have the necessary communications to promptly and effectively complete the command decision?

General KLOCKO. No, sir, I couldn't guarantee that.
Mr. HALL. Then we are in a hell of a mess, Mr. Chairman.

It is imperative that action be initiated immediately to improve the performance of the DCS and all Department of Defense communications, so that we can be assured that those systems will effectively convey command decisions to the field, and will be capable of notifying national command authorities of crisis situations in real time. If communications systems are not capable of such performance, they are worthless as an aid to command and control.

Our study revealed that the deficiencies in Department of Defense communications were the result of mismanagement rather than from any lack of, or obsolescence of, equipment. The systems of the Department utilize the latest developments in communications technology. Similarly, its research and development programs continue to seek better solutions to the peculiar problems of military communications. The heart of the problem is in the management of communications at all levels of the Department. Until very recently, little effort had been made to install any effective management over the diverse elements of the Department's communications program. It appears that the first essential step toward improvement has been taken in the unification of Department of Defense communications responsibility in the office of the Assistant to the Secretary of Defense (Telecommunications). That new office, however, must be strongly supported by the Secretary, if its efforts to establish control of Department of Defense communications are to be effective. Moreover, the staff of that office must pursue the reorganization of Defense communications aggressively and with the sense of urgency that it demands.

Of equal importance is the need for a concerted effort to improve the performance of the Defense Communications System. In order to obtain that improvement, the management of the DCS must be reorganized and greatly strengthened. The DCS must be considered as a system, and a single manager authorized to direct its operation and maintenance from end to end. Such a step is essential if its performance is to be significantly improved. The system must also be provided with management personnel possessing the proficiency in communications necessary for the effective, efficient and economic operation of a worldwide system. Obtaining such a management proficiency is essential if the myriad of problems, which have plagued the Defense Communications System throughout its first decade, are to be overcome.

Having equipped its armed forces with the finest communications equipment, at a cost of undetermined billions, this Nation has a right to demand efficient management and operation of that equipment. It also has a right to demand faultless performance of all Defense communications during periods of crisis. The Department of Defense must ensure that those demands are satisfied.

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