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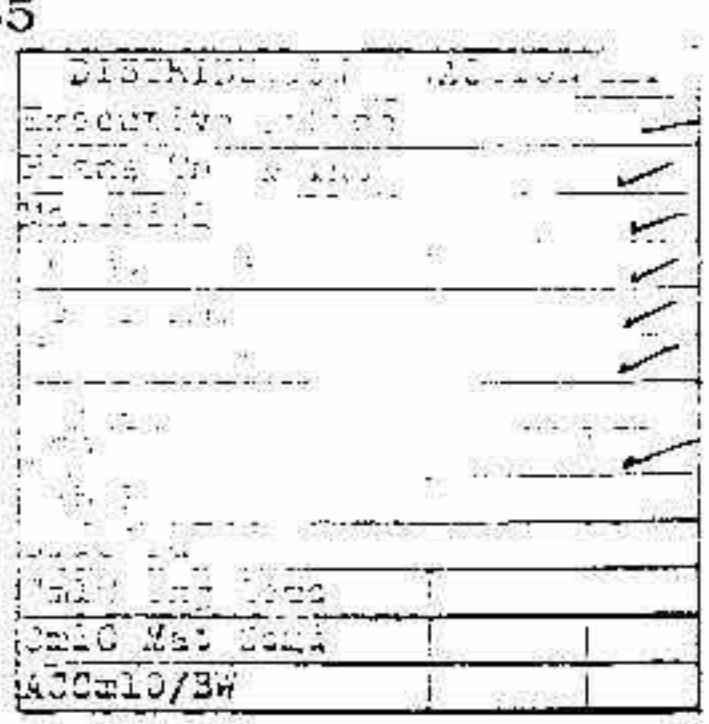
SUMMARY OF MAJOR EVENTS AND PROBLEMS

[United States Chemical Corps]

Fiscal Year 1955



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December 1955

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SUMMARY OF MAJOR EVENTS AND PROBLEMS
(Reports Control Symbol CSHIS-6)

UNITED STATES ARMY CHEMICAL CORPS

Fiscal Year 1955

Except for SECRET/RESTRICTED DATA - material Regraded Unclassified per DAMO-SWC ltr 8 JAN 90 signed by COL A.D. ROBB for MG L.J. Del Rasso

Historical Office
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December 1955

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ATOMIC ENERGY ACT 19[redacted]

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SUMMARY OF MAJOR EVENTS AND PROBLEMS

FY 1955

Page

CHARTS

TABLES

MAJOR EVENTS AND PROBLEMS

"The Corps' progress can be broken down into three different major areas; management, research, and products. The facts about the progress we are making in these three fields should be of interest to you as stockholders and working partners in the national defense program." These remarks were included in a speech delivered by the Chief Chemical Officer, Maj. Gen. William M. Creasy, at the Armed Forces Chemical Association at Cleveland on 17 June 1955. It is the purpose of this report to discuss the problems encountered in the Chemical Corps during the fiscal year 1955 in the fields of management, research, and products, and the steps that were taken toward solving those problems. (UNCLASSIFIED)

MANAGEMENT

When General Creasy assumed command of the Chemical Corps in the spring of 1954, he had some very definite ideas about deficiencies then existing in the Corps. But before putting any plans into effect, he wanted to have them considered by non-military minds, because he felt that the Army was more and more accepting civilian industry's approach to organizational, research, and production problems. General Creasy was therefore desirous that a thorough and objective reappraisal be made of the Chemical Corps so that it might reorganize and realign itself better to serve the country.[1] (UNCLASSIFIED)

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1 Draft, Speech by Maj Gen Creasy to Armed Forces Chemical Association, New York and Boston, 17 and 18 Nov 54.

Strengthening the Military-Civilian Team

In order to make such a reappraisal, the Chief Chemical Officer appointed a committee of outstanding young industrial leaders to survey the mission of the Chemical Corps and to insure that the organization was responsible to that mission. General Creasy felt that during the past few years many developments, internal and external, had influenced the organization of the Corps, not always favorably. He believed that a survey of the organization by non-military experts would result in a more objective appraisal than one conducted by personnel within the Corps. (UNCLASSIFIED)

The selection of a committee took considerable time, and the "Ad Hoc Advisory Committee on the Chemical Corps Mission and Structure" did not hold its first meeting until 11 March 1955, at Dugway Proving Ground. Mr. Otto N. Miller, a vice-president of Standard Oil of California, served as chairman of the ad hoc committee, which was popularly known as the Miller Committee. Other members were Mr. Hans A. Klagsbrunn, Washington counsel for the Olin-Mathieson Chemical Corporation, Dr. James A. Shannon, Associate Director (later Director) of the National Institute for Health, and Mr. George H. Watkins, vice-president of the University of Chicago. The Chief Chemical Officer also appointed several high-ranking officers and civilians of the Chemical Corps to assist the committee and to serve as associate (non-voting) members.[2] (UNCLASSIFIED)

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[2] The Chemical Corps representatives were Col. William J. Allen, Jr., Col. Robert W. Breaks, Lt. Col. Robert K. Nelson, Dr. John Schwab, Mr. Delbert H. Flint, and Mr. Robert A. Bergseth. See Maj. Gen William M Creasy, "Dissatisfaction Can Mean Progress," Armed Forces Chemical Journal, IX, 3 (1955), pp. 6 - 7.

While the stated purpose of the committee was purposely left rather broad and vague to allow the committee latitude in making the study, General Creasy did propound six questions as a basis on which to begin;

1. Is the Corps doing too much, or not enough?
2. Should the Corps have troops of its own?
3. Should we expand our contractual relations with industrial, scientific, and educational institutions?
4. Have all operational functions been delegated to the field commands?
5. Is the best possible use being made of scientists and engineers as well as key military and civilian personnel?
6. Is our organization responsive to requirements of financial management?[3]

With these questions in mind, as well as some of their own, the committee members spent the remainder of FY 1955 in touring Chemical Corps installations and activities, interviewing, discussing, studying operations, and critically examining relationships between the various agencies.[4] At the close of the fiscal year the Committee was in the process of compiling its reports. (UNCLASSIFIED)

Appointment of Dr. Frolich

One of the recommendations that had been made by the Killian Committee in 1952 was the appointment of a deputy chief chemical officer for scientific activities.

3 Ibid.

4 (1) The committee's report was scheduled for submission in August 1955. (2) Speech, Maj Gen Creasy to annual meeting of Armed Forces Chemical Association, Cleveland, 17 Jun 55. (3) Ltr, CCmlO to CG ACmlC et al., 15 Mar 55, sub: Ad Hoc Advisory Committee on Chemical Corps Mission and Structure, gave schedule of visits to be made by the committee.

activities.[5] This was the only major organizational change made in FY 1955, pending submission of the Miller committee report. As Deputy Chief Chemical Officer for Scientific Activities, General Creasy appointed Dr. Per K. Frolich, a top civilian scientist and administrator who had been serving as Vice-President for Scientific Activities of Merck and Company's chemical division. His acquisition was the first step taken by the Chief Chemical Officer as a means of strengthening the military-civilian team in the Chemical Corps. In appointing Dr. Frolich, General Creasy indicated that he would have four principal duties: (1) to direct research and development in the Chemical Corps; (2) to serve as chief scientist of the Corps; (3) to assist and advise the Chief and Deputy Chief Chemical Officers on all plans, policies, programs, and operations relating to research and development; (4) to represent the Chief Chemical Officer in research and development activities and, when appropriate, to coordinate Chemical Corps programs with other government agencies and private research organizations.[6] (UNCLASSIFIED)

Strengthening the Military Team

While the above two actions were taken with a view to strengthening

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See Chemical Corps Historical Office, Summary History of Chemical Corps Activities, 9 September 1951 to 31 December 1952, p. 9, for discussion of the Killian Committee and a list of recommendations.

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(1) Speech, Maj Gen Creasy to Conference on Administration of Research, New York, 9 Sep 54. (2) Ltr, CCmlO to CGs MATCOM, RECOM, TNGCOM, and ACCmlO/3W 30 Nov 54, subj: Appointment of Deputy Chief Chemical Officer for Scientific Activities.

the military-civilian team, two other actions were proposed by the Chief Chemical Officer for strengthening the Chemical Corps within the military establishment. General Creasy believed that even in military circles the Chemical Corps was too often an unknown quantity. He proposed that a one week orientation course on chemical, biological, and radiological (CBR) weapons be given at the Chemical Corps School to selected staff officers and highly placed civilians.[7] This course would closely resemble courses that have been already given at Sandia and Fort Bliss over a period of several years and which have contributed to a greatly improved understanding of the special weapons and guided missiles programs throughout the Defense Department. (UNCLASSIFIED)

A second proposal that the Chief Chemical officer made was that at least 100 officers from other arms and technical and administrative services of the Army be detailed to the Chemical Corps for one or two years of on-the-job training. This procedure, General Creasy thought, would produce tangible benefits to the trainee in the areas of research, development, production, procurement, storage, and surveillance. Intangible benefits would come from a thorough understanding of the mission, capabilities, and limitations of CBR warfare. As evidence of the value of such a two-year tour, General Creasy pointed out that the Regular Army officers of the Chemical Corps who had served two years with the combat arms returned with fresh ideas and more realistic approaches to combat use of

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7 Draft, Speech by Maj Gen Creasy to Armed Forces Chemical Association, New York and Boston, 17 and 18 Nov 54.

CBR weapons and munitions. The Chemical Corps sought to implement this type of on-the-job training by means of a staff study which was submitted to Deputy Chief of Staff for Logistics (DCSLOG) in October 1954. This study made the assumptions that all officers should understand and appreciate the capabilities and limitations of CBR warfare, that the arms as well as the technical and administrative services must be trained to cope with CBR warfare, and that a third world war would probably see the initiation of CBR warfare.[8] The General Staff ruled that the proposed program was too broad in scope for economical implementation, and that the manpower ceiling would not permit the training of 100 officers for two years with the Chemical Corps. Staff agreed, however, that the Chemical Corps could revise the program to provide for training ten officers for one year. The revised program was duly submitted, but no action had been taken by the end of the fiscal year. (UNCLASSIFIED)

Strengthening the Chemical Corps - Industry Team

The Chief Chemical Officer also took steps to improve the relations between the Corps and industry. Although those relationships had been good, General Creasy believed that they could be made even better. With the cooperation of the Armed Forces Chemical Association, a Chemical Corps Advisory Council was set up during the year. This council was made up of executives from industrial and educational organizations. These men, with experience in such fields as management, process engineering and manufacture,

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8 DF, CCmlO to DCSLOG, 11 Oct 54, subj: Chemical Corps On-The-Job Training for Officers of the Arms and Technical and Administrative Services.

purchasing and industrial mobilization planning, materiel handling and storage, instrumentation, and cost accounting, provided training and experience of a great potential benefit to the Corps in the accomplishment of its mission.[9] (UNCLASSIFIED)

Efforts to Keep the Public Informed

General Creasy entered upon his duties as Chief Chemical Officer convinced of the need to keep the American people informed of the realities of chemical, biological, and radiological warfare. During the first year of his tenure he delivered sixteen speeches at public meetings or gatherings throughout the country, in addition to six lectures before Armed Forces schools. On these occasions the Chief Chemical Officer encouraged the members of his audience to discuss his remarks with their friends and neighbors. General Creasy also encouraged Chemical Corps personnel to publish scientific and technical papers. As a result the number of such publications increased to 604 in FY 1955, a jump of 40 percent over FY 1954. However, this level of performance met with some difficulty due to a slow-down in the review and clearance processing of these manuscripts in Department of the Army staff agencies. Initial attempts of the Security Review Branch of the Office of Public Information to expedite processing of such material met with opposition, but the continued efforts began to meet with success by the end of the fiscal year. However, this was not true in the case of articles intended for the information of the

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9 Speech, Maj Gen Creasy to annual meeting Armed Forces Chemical Association, Cleveland, 17 June 55.

general public. Clearance of such material has been and continues to be a major problem to the Corps' efforts to inform the public of the nature and scope of CBR warfare, within the bounds of military security and propriety. (UNCLASSIFIED)

Thanks to the provisions of AR 10-50,[10] the Chief Chemical Officer gained tighter control and supervision over PIO activities at Chemical Corps installations. Guidance was given to field commanders and staffs on themes to be stressed in public utterances, and the field PIO staffs received indoctrination on public information policies and regulations. One recurring problem was that of maintaining a reserve of trained public information officers. Chemical Corps commanders were asked in FY 1955 to obtain volunteers for training in this field at the Armed Forces Information School.[11] (UNCLASSIFIED)

Other Management Improvements

As of 1 July 1955 three Chemical Corps posts, the Army Chemical Center, Camp Detrick, and Dugway Proving Ground, were scheduled to become Class III installations, a new Department of Army classification.[12] For some years the Army has had two classes of installations, I and II. The

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10 See below pp. 13 - 14.

11 (1) Program Presentation, Admin Div, OCCmlO, 23 Aug 55. (2) Interv, Hist Off with Miss Katherine Smith, Admin Div, OCCmlO, 17 Aug 55.

12 DA GO 23, 25 Mar 55, eff 1 Jul 55.

Class I posts are those where the training of troops was the primary job and these were under the jurisdiction of the six continental Army commanders. Class II posts are those under the command of a staff agency of the Department of the Army and are primarily logistical in nature, but where the Army commander also had some responsibilities such as budgeting, funding, and provision of personnel and equipment for what might be called "housekeeping" duties. (UNCLASSIFIED)

Prior to 1 July 1955 all Chemical Corps installations had been Class II, and this divided responsibility had frequently proved a source of conflict and inefficiency. The commanding officers of installations did not have control over activities essential to their missions, such as engineering services, transportation, and medical services. Under the new Class III system this situation was rectified, for it was provided in new Army Regulations that, "Funds and personnel authorizations for all support functions performed by an installation should be provided through the command channel having responsibility for support functions."[13] In other words, the commanders of Chemical Corps installations would handle manpower, materiel, and facilities for housekeeping at their installations.[14] While this was an improvement over former practice, the Corps came to realize while planning the transfer of the three installations to the Class III

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13 AR 10-50, 27 Jun 55.

14 AR 10-50 did not provide for installations and activities which had been granted charters under the Army Industrial Fund. These were governed by the provisions of AR 37-70 and AR 37-71.

category, that the new system was not without its "headaches." The new services for which the Corps became responsible required funds, and with emphasis on economy by the Department of Defense it was sometimes a problem to obtain funds. (UNCLASSIFIED)

Another management improvement resulted from the Department of Defense introduction of a preferential planning list and changed planning concepts in Industrial Mobilization Planning.[15] The Chemical Corps, assigned to supply a variety of non-commercial items in event of mobilization, was experiencing a considerable problem in planning for all items and in keeping industry informed of expected requirements. The preferential planning list allowed the Chemical Corps to institute a new program concentrating on a reduced list of the items of greatest mobilization importance and those for which industrial lead time was the longest. Planning was accordingly completed during the year on a number of high-priority items, and the mobilization organization was thoroughly reviewed and strengthened.[16] (UNCLASSIFIED)

Within the Chemical Corps several management techniques aimed at improved efficiency were adopted. In the Engineering Agency a program to effect closer coordination between the statistician and the engineer was launched. As part of this program a Statistical Symposium, attended by some 250 engineers and statisticians from all parts of the country,

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15 DOD Dir 4005.6, Title: Production Allocation Program Planning Office of the Asst Sec Defense for Supply and Logistics, 26 Jan 54.

16 See below, pp. 143 - 144 for details.

was held at the Army Chemical Center. In an effort to improve its training program the Corps secured the services of a civilian management firm to make a survey and recommendations.[17] (UNCLASSIFIED)

In an effort to encourage better management within the Corps, General Creasy suggested the application of more imaginative planning to each new development or problem or policy. Commanders within the Corps were urged to take the time to consider the broad implications of their daily tasks on Chemical Corps policy, even within the areas of responsibility of other commands.[18] (UNCLASSIFIED)

Organizational Changes

Two features of the reorganization of the Department of the Army (DA) in FY 1955 affected the responsibility of the Chemical Corps and altered somewhat the chain of command. The first was the creation, on 8 September 1954, of the position of Deputy Chief of Staff for Logistics (DCSLOG) in the Office of the Chief of Staff.[19] Under the functional supervision of the Assistant Secretary of the Army (Logistics and Research and Development) DCSLOG had DA staff responsibility for logistics planning, development and supervision of the logistics programs, development and supervision of Financial Property Accounting, Stock Funds, and Industrial Funds,

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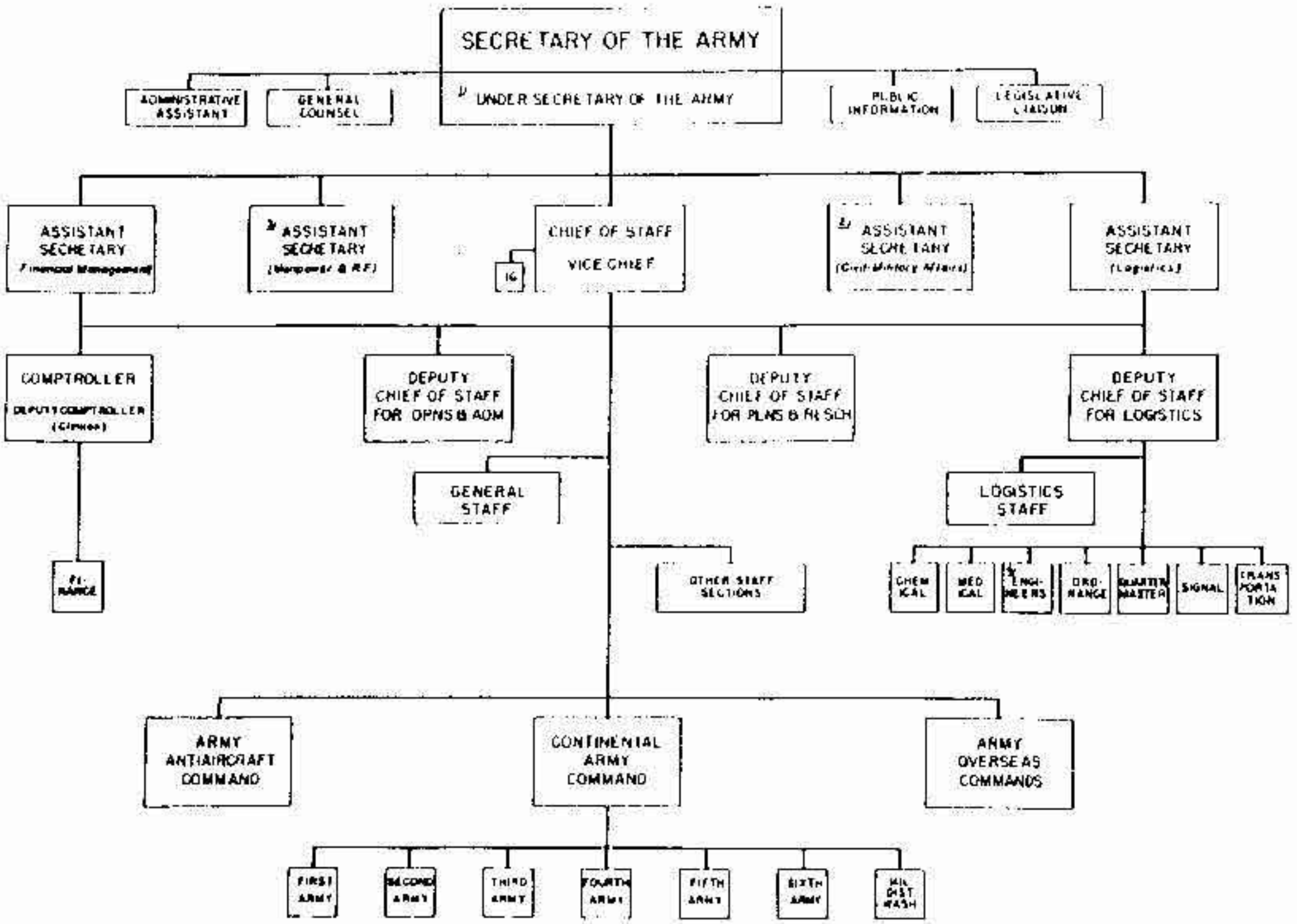
17 See below, p. 85.

18 Ltr, CCmlC to CO A CmlC, TNGCOM, MATCOM, REGCOM, and ACCmlO/3W, 23 Jul 54, subj: Imaginative Planning.

19 DA GO 66, 8 Sep 54.



1/ General Management, Analysis and Review

2/ Manpower, Reserve, Civil Functions, Political-Military-Economic Affairs

3/ Direct working relationships with civilian and military personnel elements of Army Staff

4/ Additional direct responsibilities to Assistant Secretary (Civil-Military Affairs)

and the formulation of policy and evaluation of results in matters of logistics. Of chief importance to the Chemical Corps was the responsibility given DEP LOG for the direction and control of the technical services in all the above responsibilities as well as prescribing their mission, organization, and procedures.[20] DEP LOG fell heir to the duties of the Assistant Chief of Staff, G-4, as well as additional responsibilities and control. (UNCLASSIFIED)

The creation of a Continental Army Command (CONARC) on 1 February 1955 was the second major change which affected Chemical Corps responsibilities and organization. The Office of the Chief of Army Field Forces was abolished and replaced by Headquarters, CONARC, which was directly responsible to the Chief of Staff. The Commanding General, CONARC, received command of the six continental armies, and the Military District of Washington (MDW). He was charged with the general direction and supervision of all matters pertaining to the development of tactics, techniques, organization, doctrine, and materiel for use by the Army in the field and with the training and training inspection of the Army within the continental United States.[21] This change in the Army structure gave CONARC responsibility for training which was administered, as far as Chemical Corps was concerned, by instructions issued to the Chief Chemical Officer. The change also led to the creation of a Combat Developments organization

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20 C 4 SR 10-5-1, 6 Sep 54; C 5 SR 10-5-1, 17 Jan 55.

21 (1) C 7 SR 10-5-1, 1 Feb 55; C 9, 1 Mar 55. (2) See Chart 1.

within headquarters, CONARC, and a similar section within Plans Branch of the Office of the Chief Chemical Officer. (UNCLASSIFIED)

Organizational changes within the Chemical Corps were few in FY 1955, due in large measure to the desire of the Chief Chemical Officer to await the findings of the committee which he appointed to reappraise the mission and structure of the Corps. There was little point in making changes which might be reversed or further altered by the findings of the Miller Committee. (UNCLASSIFIED)

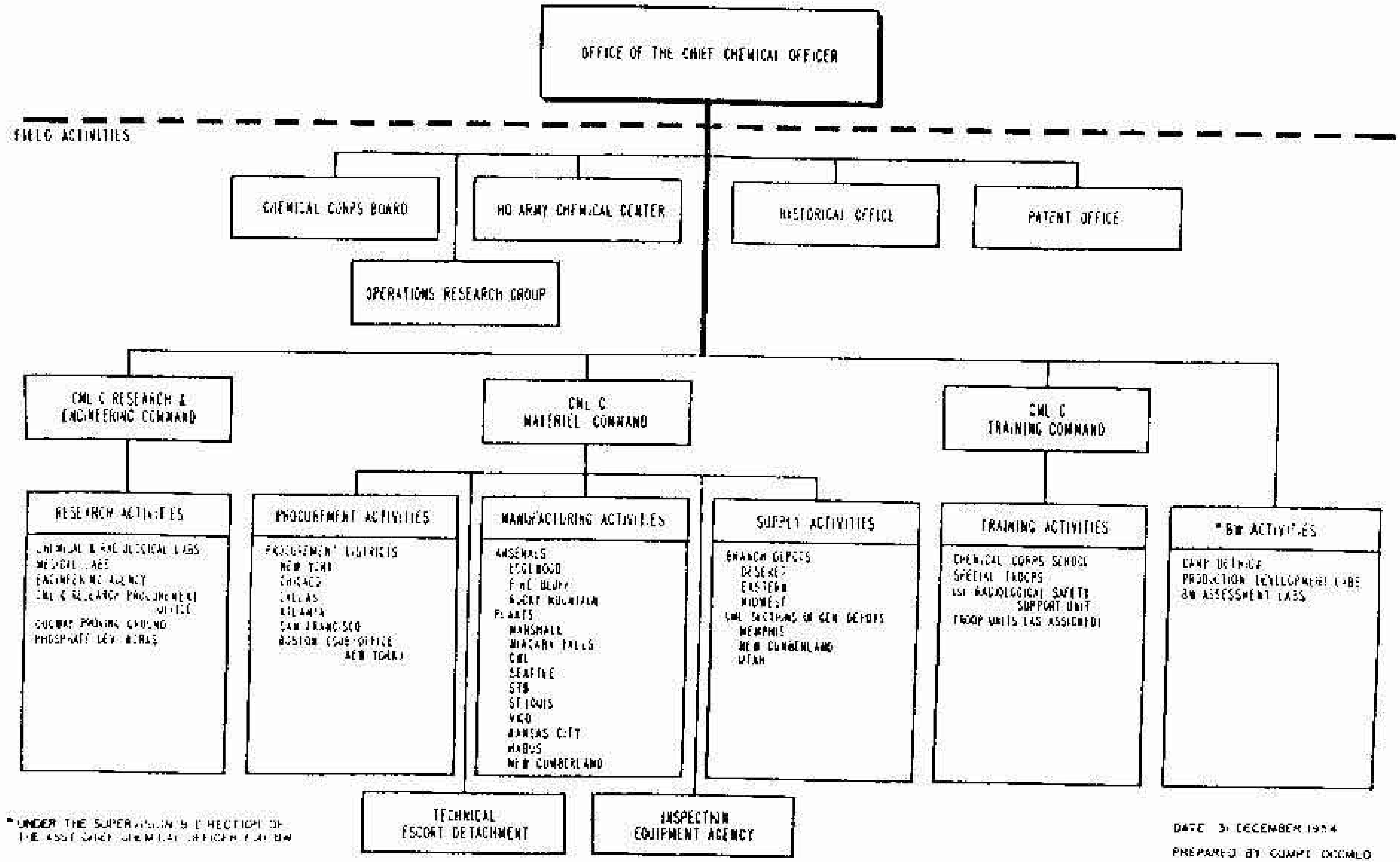
Two installations were transferred from Chemical Corps jurisdiction during the fiscal year. Fort Terry, which had been intended for joint occupancy with the Bureau of Animal Industry for research on animal diseases, was placed in an inactive status,[22] and Deseret Chemical Depot was redesignated as the Deseret Depot Activity, a Class II activity under the jurisdiction of the Chief of Ordnance, in order to effect overhead cost reductions made possible by satelliting Deseret on Tooele Ordnance Depot.[23] A new organization, the Chemical Corps Intelligence Agency, was established as a Class II field activity of the Chief Chemical Officer on 15 April 1955 at Gravelly Point, Va.[24] (UNCLASSIFIED)

22
(1) DA GO 38, 26 May 54, eff 1 Jul 54. (2) OCCmlO GO 13, 27 Jul 54.

23
DA GO 29, 29 Apr 55, eff 1 May 55.

24
(1) DA GO 27, 15 Apr 55. (2) OCCmlO GO 3, 24 Apr 55. (3) For details on the new agency, see below, pp. 106 - 07.

U.S. ARMY
CHEMICAL CORPS



* UNDER THE SUPERVISION & DIRECTION OF THE ASST CHIEF CHEMICAL OFFICER FOR BW

DATE 31 DECEMBER 1954

PREPARED BY COMPT OCCMLO

PAGE 19 OF 152 PAGES
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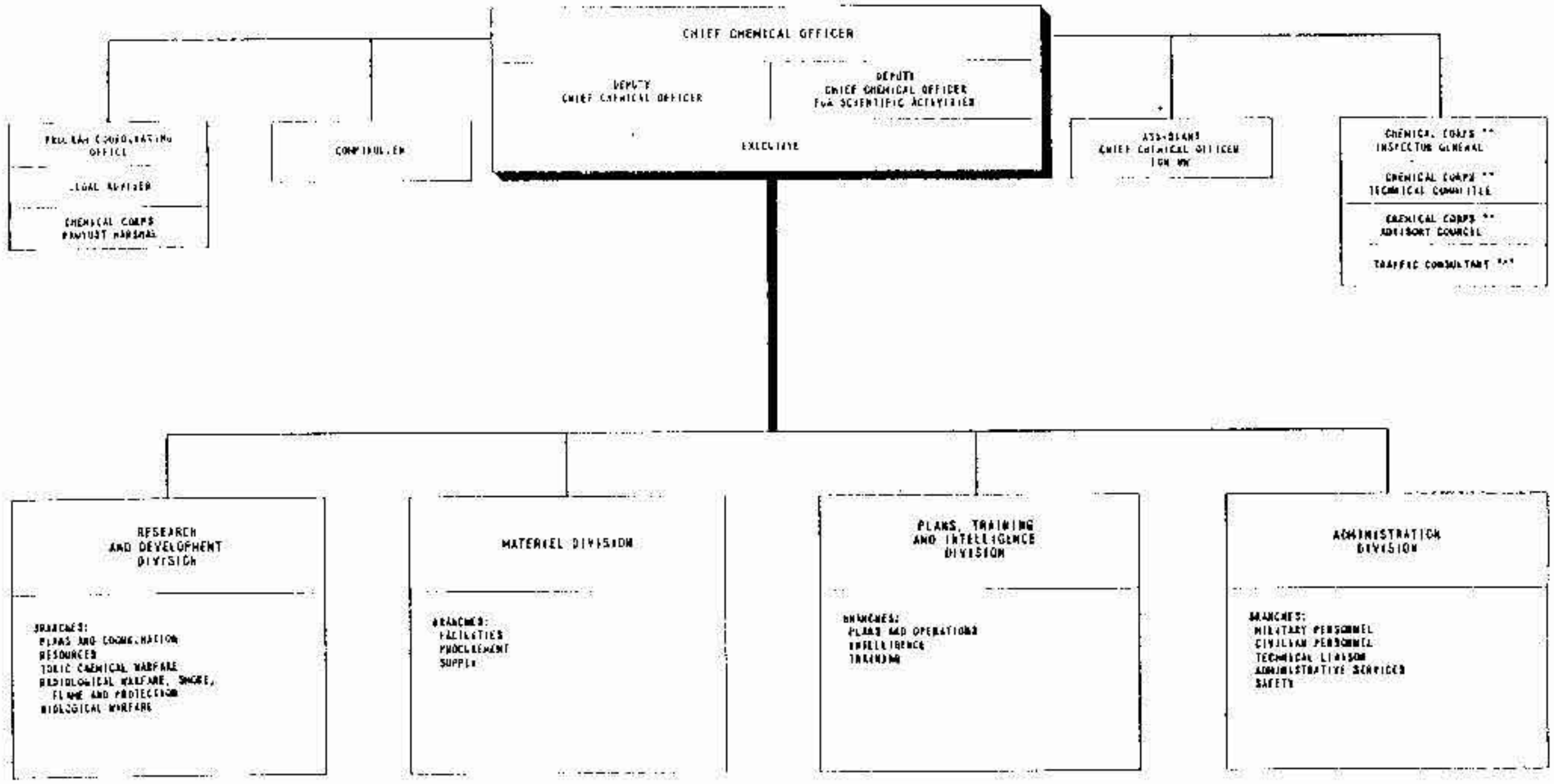
Chart 1 — DEPARTMENT OF THE ARMY

OFFICE OF THE CHIEF CHEMICAL OFFICER



* Location at Camp Detrick, Maryland
** Temporary location at Army Chemical Center
*** Location at Cold Harbor, Baltimore, Md.

APPROVED:

WILLIAM M. CREASY
Major General, USA
Chief Chemical Officer

DATE: 1 December 1954

PREPARED BY: MANAGEMENT BRANCH
COMPTROLLER OF THE CHEMICAL CORPS

With the exception of the creation of the post of Deputy Chief Chemical Officer for Scientific Activities, the changes in organization within the Office of the Chief Chemical Officer were relatively minor in nature and mostly reflected the additional responsibilities given the Chemical Corps under AR 10-50.[25] Materiel Division was reorganized on 2 May 1955, and Plans Branch of Plans, Training, and Intelligence Division underwent a temporary reorganization (later made permanent) on 17 March 1955 in order to establish a Combat Developments Section.[26] Safety Branch was reestablished in Administration Division.[27] (UNCLASSIFIED)

Personnel

Military Personnel

In FY 1955 Chemical Corps world-wide officer strength rose from 1,528 to 1,684. As of 1 July 1955 this was an overstrength of 8.7 percent as contrasted with an understrength of one year before of some 10 percent. The overstrength was largely due to the influx of ROTC graduates, some 471 in number.[28] ([redacted])

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25 Organizational changes within the three commands will be found under the discussion of each command.

26 (1) OCCmlO GO 6, 6 May 55; also, see below, pp. 116 - 17 /Materiel/
(2) See below, pp. 69 - 70/Plans/ for discussion of this change.

27 CCCmlO GO 15, 11 Aug 54, eff 2 Aug 54.

28 For detailed statistics on military and civilian personnel, see Appendix A, Review and Analysis of Chemical Corps Programs, Fourth Quarter, FY 1955.

A continuing problem in the Chemical Corps stemmed in part from the influx of short-term ROTC officers. Thanks to that program there were plenty of company grade officers; however, there was a serious shortage of field grade officers which could not easily be resolved.[29] Despite the actual increase in numbers the long-range trend for officer personnel in the Chemical Corps was one of gradual reduction to a peacetime establishment of high quality officers. Categories were not being renewed in many cases and officers were dropped when unfit for promotion. As part of this long-range program, the Department of Army established a policy providing for the elimination of any officer twice passed over for temporary promotion to the same grade on a "fully qualified" basis. Non-Regular Army officers so passed over, for grades captain through lieutenant colonel, were to be notified of prospective relief from active duty within 120 days.[30]
(UNCLASSIFIED)

The actual enlisted T/D strength of the Chemical Corps (CONUS) in FY 1955 ran continually above authorized strength, reaching a peak in April before tapering off to 2,980 by the end of June. This overstrength resulted from DA action in assigning these personnel even though authorizations were not available and requisitions for them had not been submitted. (UNCLASSIFIED)

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29 Interv, Hist Off with Lt Col J B Costello and Mr Forrest C Hall, Mil Pers Br, OCCmlO, 24 Aug 55.

30 (1) DA msg 57361, 29 Dec 54. (2) Admin Div, OCCmlO, Notes for Staff Conf, 5 Jan 55.

Table 1 — Personnel (Continental United States)

Date	Officers	Enlisted	Civilians
31 Sep 54 . . .	764	2,874	12,512
31 Dec 54 . . .	826	3,090	12,535
31 Mar 55 . . .	922	3,194	12,104
30 Jun 55 . . .	940	2,980	11,865

Source: Appendix A and 1st, 2d, and 3d Qtr FY 55 R & A Rpt.

By far the greater portion of officers in the United States Army since 1940 have been Reserve officers. Yet during the fifteen years from 1940 to 1955 these officers on extended active duty (EAD) were unable to achieve any real stability in what had become for them a career. In FY 1955, under the direction of the Secretary of the Army, a long-range program was developed for USAR officers serving on EAD. Under this plan, the former categories I, II, and III were replaced by an indefinite category leading to twenty years' service, ten of which had to be commissioned. It was hoped that this plan would provide career stability and open certain career schools to such officers. On retirement these USAR officers would also receive certain privileges formerly reserved for officers of the Regular Army. (UNCLASSIFIED)

In FY 1955 DEP LOG issued a policy directive for the selection, training, and utilization of key procurement officers, who were defined by DEP LOG as those lieutenant colonels, colonels, and general officers of the Army who had procurement assignments as their primary duty under a chief of a technical service. DEP LOG ordered the Chief Chemical Officer and other chiefs of technical services to (1) stabilize tours of

duty in key procurement positions at a minimum of three years, (2) to submit a report on key procurement officers, and (3) to maintain adeq records on which future annual reports on key procurement officers co be based. The Chemical Corps selected the following key positions fo submission to DEP LOG:

Commanding Officers, New York and Chicago Procurement Distric
Chief, Industrial Division, Materiel Command
Chief, Procurement Division, Research & Engineering Command
Commanding Officer, Research Procurement Office
Commanding Officer, Chemical Section, Memphis General Depot[31]

With the objective of assuring the availability of sufficient qu fied and experienced officers to meet the needs of its research and d opment program, the Chemical Corps published a regulation on the care development and utilization of selected officers in that field.[32] Th regulation provided for the development of a career pattern for Chemi Corps research and development personnel from their initial entry int the program to positions at the highest levels. Officers would take petitive but not consecutive tours in research and development throug the twenty-first year of service. Each Chemical Corps agency was mad responsible for continual screening of its officers and for recommend tions for or against their retention in the program. During FY 1955 Department of the Army also established a new enlisted personnel mana ment system to strengthen the career program for Regular Army personn as well as to facilitate the training and assignment of all enlisted

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31 Summary of Staff Conference, OCCmlC, 22 Jun 55.

32 CmlC Reg 65-5, 9 Jun 55. See also DA Memo 611-108-1.

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personnel.[33] (UNCLASSIFIED)

In an effort to improve personnel utilization, the Assistant Chief of Staff, G - 4 (later DEP LOG), directed the technical services to develop military-civilian staffing policies for CONUS installations and activities under their command with the following objectives:

1. To eliminate dual staffing by military and civilian personnel.

2. To establish more attractive career opportunities.

3. To encourage mutually supporting and complementary military-civilian staffing at managerial levels.

(UNCLASSIFIED)

Pursuant to the G - 4 directive, the CCCmlO sent a team of two members -- one from Military Personnel Branch and one from Civilian Personnel Branch -- to make a long-range study of Chemical Corps installations and activities with similar or comparable missions to obtain information upon which workable staffing patterns could be based. This team studied organizations at the procurement district offices, and planned similar studies at command headquarters, arsenals, research and development, and development, and proving ground activities.[34] (UNCLASSIFIED)

The initial study of procurement districts indicated only minor adjustments were required in staffing procedures and policies. In November, DEP LOG issued a directive on the staffing policy for Class II installations with a prime objective of eliminating dual staffing, and the Chemical Corps estimated the submission date for the Chemical Corps plan for

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33 4th Qtr FY 1955 Review and Analysis, Admin Div, 23 Aug 55.

34 Program Presentation, First Quarter FY 1955, "Military Personnel Program."

implementation of the DEP LOG directive as about 1 September 1955.[35] During the latter part of the fiscal year the team visited Pine Bluff Arsenal, Camp Detrick, Dugway Proving Ground, and Rocky Mountain Arsenal. Studies at these places revealed certain staffing policies which varied from DEP LOG policy, such as dual staffing and the practice of assigning military personnel as subordinates to civilians in the chain of command.[36] (UNCLASSIFIED)

In FY 1955, the system of submitting requisitions to TAG for enlisted replacements was discontinued. Under the new system, TAG determined the requirements of each technical and administrative service by comparing the actual and authorized strength as revealed on the monthly inventory and projection of authorized and actual strength report. After the requirements were determined, TAG advised training divisions, reassignment stations, service schools, and the like that a certain number of enlisted personnel (by grade and MOS) were assigned to the Chief Chemical Officer and that specific assignment instructions would be furnished by the Chemical Corps. This new program provided a much better distribution of enlisted personnel as well as a better overall control.[37] (CONFIDENTIAL)

Numerous changes took place in key Chemical Corps military personnel during FY 1955. The Deputy Chief Chemical Officer, Charles E. Loucks,

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35 (1) DEP LOG Dir 62. (2) Summary of Staff Conference, OCCmlO, 16 Nov 54, p. 1.

36 Program Presentation, Admin Div, OCCmlO, 4th Quart FY 1955.

37 Summary of Staff Conference, OCCmlO, 20 Apr 55.

was advanced from brigadier to major general in July 1954, the first Corps officer ever to reach that rank without serving as Chief Chemical Officer. General Loucks retired from active service the following May.[38] Colonels John R. Burns and Marshall Stubbs were both advanced to the temporary grade of brigadier general in July 1954. Col. William E. R. Sullivan, who had relieved Col. Delancey R. King as Executive Officer, OCCmlO, in October 1954, was appointed to serve as Acting Deputy Chief Chemical Officer, effective 1 June 1955. (UNCLASSIFIED)

Changes in key personnel assignments included the following:

Office, Chief Chemical Officer

Col. William E. R. Sullivan, from Commanding Officer, Research and Engineering Command, to Executive Officer, 14 October 1954.

Col. Henry M. Rund, to Chief, Administration Division, 4 October 1954.

Lt. Col. Vincent J. Kosebutski, from Asst. Chief, to Acting Chief, Materiel Division, 25 April 1955.

Lt. Col. Vincent F. LaPiana, from Assistant Chief to Chief, Research and Development Division, 15 November 1954.

Col. Ronald L. Martin, from Chemical Officer, Third Army, to Chief, Research and Development Division, 9 June 1955.

Col. Charles W. Mussbaum, to Comptroller, 27 June 1955.

Col. Frank M. Arthur, from George Washington University to Chief, Plans, Training and Intelligence Division, 1 July 1954.

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38 DA SO 102, 23 May 55, eff 31 May 55.

Field

Col. William R. Currie, from Deputy Commander to Commanding Officer, Training Command, 1 September 1954.

Col. William J. Allen, Jr., from Research and Engineering Command to Commanding Officer, Engineering Agency, 2 August 1954.

Lt. Col. Allan C. Hamilton, from USAREUR to Commanding Officer, Edgewood Arsenal, 20 July 1954.

Lt. Col. James W. Talley, from Deputy Commander to Commanding Officer, Eastern Chemical Depot, 28 February 1955.

Lt. Col. Charles H. McNary from Executive Officer to Commanding Officer, Chicago Chemical Procurement District, 1 July 1954.

Col. Theodore P. Canan, from Chemical Corps Board to Chemical Officer, First Army, 1 August 1954.

Col. Ragnar E. Johnson, to Chemical Officer, Second Army, 1 September 1954.

Col. Ronald L. Martin, from Chemical Officer, Seventh Army, to Chemical Officer, Third Army, 1 September 1954.

Col. Fred W. Ludecke, from Training Command to Chemical Officer, Sixth Army, 12 August 1954.

Col. Clarence B. Dremmon, Jr., to Chemical Officer, Seventh Army, 15 July 1954.

Lt. Col. Leslie S. Moore, from Korean Military Advisory Group to Chemical Officer, Eighth Army, 2 July 1954.

Col. Roy W. Muth, from Chemical Officer, Sixth Army, to Chemical Officer, USAFFE, 1 July 1954.

Lt. Col. John G. Appel, to Chemical Officer, USAREAHS, 4 August 1954.

Lt. Col. Richard C. Gordon, to Chemical Officer, USARPAC, 20 August 1954. (UNCLASSIFIED)

Civilian Personnel

FY 1955 found civilian personnel strength generally stable with small decreases in the latter part of the year as the nation cut back production

of military items. During the year civilian strength declined slightly from 12,567 to 11,865. The largest single portion of this reduction came with the transfer of Deseret Chemical Depot to the Ordnance Corps. Utilization of total spaces improved from 92 percent at the close of FY 1954 to 96 percent at the end of FY 1955. (UNCLASSIFIED)

Average civilian strength serviced during FY 1955 dropped about 14 percent, largely due to reduction in force at Pine Bluff and Rocky Mountain Arsenals, the loss of Deseret Chemical Depot to Ordnance, and the satellization of civilian personnel administration of New York Chemical Procurement District. The Chemical Corps quit rate (based on voluntary separations) remained below the DA rate and below the rates for FYs 1953 and 1954 with resultant savings of thousands of dollars. Although the Chemical Corps was recruiting, in terms of average strength serviced, twice as many professional and scientific personnel as the average major commands, none of the seven civilian personnel officesexperienced extreme difficulty in filling positions, except at Camp Detrick. The planned expansion and need for a high proportion of hard-to-fill positions continued at the Chemical Corps Biological Laboratories. Camp Detrick continued a vigorous recruitment program to reduce the ninety-three existing vacancies. A Corps-wide inventory and forecast of needs for biological scientists was made to serve as a basis for future planning.[39] (UNCLASSIFIED)

Three major proolems plagued civilian personnel administration in the Chemical Corps during FY 1955. The first of these was the difficulty in

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39 4th Quart FY 55 Review and Analysis, Admin Div, 23 Aug 55.

filling a growing number of professional and scientific positions. Considerable effort was made to reduce these vacancies, but the higher pay and chances for advancement offered by private industry made recruitment difficult. As a result, the Chemical Corps (and other technical services) not only had trouble in attracting key officials but also had to use every means of persuasion to retain those already employed. It was especially difficult to fill the "super-grades" intended for occupancy by key civilian officials. In 1947 Congress had passed Public Law 313 which established civilian positions above the general schedule of grades with salaries ranging from ten to fifteen thousand dollars. Of thirteen such positions allotted to the Army, the Chemical Corps received two. Two years later the Classification Act of 1949 established super-grades GS-16, 17, and 18. The Chemical Corps received two spaces in addition to those already allotted in 1947, making a total of four civilian super-grades in the Chemical Corps, all in the research and development field. The Chemical Corps requested seven additional GS-16 and GS-17 spaces in FY 1953 to provide civilian technical competence and leadership for the research program, but the Department of the Army was unable to provide the spaces without withdrawing them from other elements of the Army.[40] (UNCLASSIFIED)

A second major problem area in civilian personnel administration was the inability to accomplish scheduled surveys for the annual review of positions, the chief cause of which appeared to be an excessive number of requests for individual actions. The Chemical Corps made continuous efforts to educate

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40 Interv, Hist Off with Mr Gerald M West, Civ Pers Br, OCmlO, 17 Aug 55.

operating officials on the advantages of job survey methods over the individual action request. It was felt that survey schedules could be met if the individual actions were held to the bare minimum. Some success was met in this orientation, in that individual requests for action during the first three quarters of FY 1955 amounted to 28 percent of average strength as compared with 36 percent in FY 1954. Only one Chemical Corps civilian personnel office, Pine Bluff Arsenal, succeeded in auditing all positions on survey schedule during the year. Although fewer positions were audited on an individual request basis in FY 1955 than the preceding year, the need for even more vigorous action was indicated.[41] (UNCLASSIFIED)

During the second quarter of FY 1955, an inspection by the Civil Service Commission and the Department of the Army Civilian Personnel Office revealed many deficiencies in the civilian personnel program of the Chemical Corps, particularly at Army Chemical Center. Although each installation had some phases that were operated at or above DA standards, no one installation had a total program that even met DA standards in all respects.[42] The Department of the Army expressed concern over the increased number of high-grade positions, and placed upon each commander and chief of service the responsibility for review of all such positions and the abolition of those which could not be fully justified. DA preferred this means to the establishment of ceilings in high-grade categories. Back of this action

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41 4th Quart FY 55 Review and Analysis, Admin Div, 23 Aug 55.

42 Program Presentation, 2d and 3d Quarts FY 1955, "Civilian Personnel Program."

was the anticipation that Congressional committees would insist upon detailed information and complete justification of those positions.[43] (UNCLASSIFIED)

When the inspectors of the Third U. S. Civil Service Region conducted their inspection of civilian personnel administration at Army Chemical Center from 10 November to 10 December 1954, they discovered a 32 percent violation rate out of a sample of 172 personnel actions examined. This contrasted with the overall Department of the Army rate of 3 percent.[44] Correction of these violations, and the situation giving rise to them, was one of the most serious civilian personnel problems encountered in the Chemical Corps in FY 1955. (UNCLASSIFIED)

Long before the Civil Service Commission submitted its final inspection report, the commanding general of Army Chemical Center took the initiative and proposed the establishment of a cadre for the purpose of reviewing the entire civilian personnel situation and to take or recommend corrective action.[45] Members of the cadre were drawn from the Civilian Personnel Branch of the CCCmlO, Research and Engineering Command, Camp Detrick, Office of Civilian Personnel, Department of the Army, and the Third U. S. Civil Service Region. This cadre operated under the immediate supervision of the commanding general of Army Chemical Center. From 10 January to

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43 Summary of Staff Conference, OCCmlO, 5 Jan 55.

44 DF, C Admin Div to CCCmlO, 5 Aug 55, subj: Civil Service Commission Inspection of Army Chemical Center.

45 Ltr, S P Ryder, Dir 3d US CS Region to CG ACmlC, 28 Jul 55.

15 April 1955 it examined 1,150 personnel actions involving GS-5s and above and a small sample of GS-4s. The cadre found 198 actions in violation of Civil Service Commission regulations and standards as well as 50 procedural errors, or a violation rate of 17 percent. While 93 violations were successfully resolved by the cadre, 105 violations, involving 86 employees, were found unresolvable short of action adverse to the employees. (UNCLASSIFIED)

The final report of the Civil Service Commission inspection submitted on the last day of FY 1955, revealed that the basic cause of unsatisfactory conditions at Army Chemical Center was the lack of a qualified, professional staff in the Civilian Personnel Office.[46]

Safety

A Safety Branch was reestablished in OCCmlO in August 1954. The new branch received responsibility for all safety, not just technical safety as had been the case with Technical Safety Branch before the latter's abolition in March 1954. During the interim period, the functions and responsibility for the safety program in the Chemical Corps rested with the Chief, Administration Division, as DA regulations required a safety program. (UNCLASSIFIED)

Unlike other programs, the safety program runs on a calendar year basis. Chemical Corps accident experience in CY 1954 showed a decrease in all categories over CY 1953, with the exception of military personnel where there was an 8.5 percent increase. The motor vehicle accident rate of 1.0 per 100,000 miles of operation compared favorably with the average 1.3 for the

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(1) DF, C Admin Div to CCmlO, 5 Aug 55, sub: Civil Service Commission Inspection of Army Chemical Center, (2) Report of Civil Service Commission on Inspection of Army Chemical Center, 30 Jun 55.

technical services over the past five years. The greatest improvement, however, was in the civilian personnel accident experience where the frequency rate decreased 29 percent from the CY 1953 figure. Dugway Proving Ground received a National Safety Council Award of Honor for CY 1954 for a 19.8 percent reduction of accident and injury rates as compared with its 1952 and 1953 average. The installation also received the Armed Forces Chemical Association Safety Award.[47] (UNCLASSIFIED)

A significant problem affecting the Safety Program was the proposed revision of AR 75-15, "Explosive-Ordnance Disposal Responsibilities." The proposed revision by Ordnance would have given the Chief of Ordnance responsibility in areas considered Chemical Corps responsibility. The matter was under review at Department of Defense level, but Ordnance was apparently anticipating a favorable decision and working on implementation instructions.[48] (UNCLASSIFIED)

Welfare and Morale Services

One of the results of the publication of AR 10-50 was the creation of a Welfare and Morale Branch in Administration Division, OCOmlO, on 1 July 1955.[49] A great deal of preliminary work was done in FY 1955 to

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(1) OCOmlO GO 15, 11 Aug 54, eff 2 Aug 54. (2) Interv, Hist Off with Miss Katherine Smith, 17 Aug 55. (3) Interv, Hist Off with Maj K R Czarny, C, Safety Br, 17 Aug 55. (4) Program Presentation, 2d Quart FY 55, "Safety Program." (5) For complete figures for FY 1955 see Appendix A to this summary.

48
4th Quart FY 55 Review and Analysis, Admin Div, 23 Aug 55.

49
OCOmlO GO 11, 18 Jul 55.

meet the 1 July 1955 deadline. Problems encountered included uncertainty as to staffing, exact area of responsibility, and all such problems which plague a new organization.[50] One officer and one civilian in the OCmlO were assigned to handle the staff guidance for the program in the Chemical Corps. (UNCLASSIFIED)

The Welfare and Morale Services program included several main categories of responsibility. First, and most important, was the responsibility for Special Services — Service Clubs, Libraries, Sports and Recreation, Entertainment, Day Rooms, Army Motion Picture Service. Another field of responsibility involved the administration of nonappropriated funds to include officer and noncommissioned officer messes. The program handled such matters in the area of personal affairs as Army Emergency Relief and soldier voting, while a fourth area was that of community services. In order to expedite the work of the branch, the Chief Chemical Officer authorized direct communication with the above activities at Chemical Corps installations.[51] (UNCLASSIFIED)

Financial Management

Obligations of FY 1955 funds represented only a slight decrease from the FY 1954 fund obligation of $118,052,000. While research and development obligations remained fairly static, the materiel obligations continued

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50 Interv, Hist Off with Mr Rudolph E Hegdahl, Welfare and Morale Br, 17 Aug 55.

51 Ltr, OCmlO to CG AMCOM et al., 13 Jun 55, subs: Responsibilities under AR 10-50.

their downward trend as the Army cut back procurement in the interest of economy.[52] The Chemical Corps achieved an overall obligation rate of 95 percent in FY 1955 which represented a considerable improvement over the preceding fiscal year when but 82 percent was obligated. Table 2 gives the source of funds and Table 3 the application by primary program.

(UNCLASSIFIED)

Table 2 — Source of Funds (Dollars in thousands)

Source	Amounts
TOTAL	$113,177
DA (CmlC)	76,415
Air Force	4,615
Navy	2,424
Ordnance	22,612
Other (Other DA Tech Svc, MDAP, etc.)	7,111

Source: 4th Quart FY 55 R&A Rpt, see Appendix A

Table 3 — FY 1955 Funds - Obligated by Chemical Corps
(Dollars in thousands)

Primary Programs	Amounts Obligated
TOTAL	$107,323
Command and Management	1,742
Training	1,208
CW, BW - R & D	20,879
BW - R & D	22,966
Industrial Mobilization	11,533
Materiel	40,182
Supply, Distribution & Maintenance Services	6,068
Army Reserve and ROTC	1,536
Other Operational Activities	5
Intelligence	1,178
	25

Source: 4th Quart FY 55 R&A Rpt, see Appendix A

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52 For fiscal details see Appendix A.

Army Industrial Fund

During the year Camp Detrick joined the growing number of Chemical Corps installations chartered under the Army Industrial Fund (AIF). There were some delays due to a lack of firm policy (Bureau of the Budget approval was uncertain for some time) but Camp Detrick conditionally went under the Army Industrial Fund as of 1 June 1955 with a cash allocation of $4,500,000.[53] This was the second application of the AIF to a Chemical Corps research and development installation, Dugway Proving Ground having commenced operations under AIF on 1 July 1953. Army Chemical Center, the only remaining installation to be considered, is being scheduled for the Army Industrial Fund. (UNCLASSIFIED)

Financial Inventory Accounting and the Army Stock Fund

The Chemical Corps made considerable progress in FY 1955 in the installation of Financial Inventory Accounting (FIA) (formerly known as Financial Property Accounting) and the Army Stock Fund (ASF). Public Law 216 in 1949[54] required the Department of Defense to establish stock funds for the purpose of financing the acquisition, holding, and sale of inventories. A prerequisite to the establishment of the Army Stock Fund in the Chemical Corps was Financial Inventory Accounting. For the first time, a

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53 (1) Interv, Hist Off with Mr Keith Nelson, Off of the Comptroller, OCCmlO, 25 Aug 55. (2) Quart Hist Rpt, Comptroller CmlC, Apr - Jun 55.

54 63 Stat. 585; 5 U.S.C. 172d.

price tag was placed on the inventory of the Army.[55] On 1 January 1954 the Chemical Corps had actively begun operations under FIA in all depots and sections of general depots. (UNCLASSIFIED)

On 1 July 1954, the Army Stock Fund for the Chemical Corps was capitalized at about $70,000,000 and a home office established at Chemical Corps Materiel Command (MATCOM) in Baltimore, with the three branch offices at the three general depots having chemical sections — New Cumberland, Memphis, and Utah. The Chemical Corps immediately ran into a problem. Depot fiscal clerks lacked knowledge of commercial accounting, being familiar only with appropriation accounting, which compelled the Corps to leave trained personnel at each installation to conduct on-the-job training. (UNCLASSIFIED)

The Chemical Corps barely had the Army Stock Fund running in CONUS depots, when the Department of the Army directed that ASF be extended to overseas depots under FIA by 1 July 1955 and to the six posts, camps, and stations in the Third Army area of the twenty-six CONUS posts where FIA had already been installed. To cope with this situation, in January 1955 the Chemical Corps brought in about twenty key personnel from overseas theaters — theater comptrollers, G - 4s, theater chemical officers, and chemical depot commanders — for a three-week indoctrination course on the Army Stock Fund. This group received detailed instructions on the operation of the

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(1) Most of this section is based on an interview, Hist Off with Mr J W Strother, Chief, Stock Fund and Financial Inventory Accounting Section, Office of the Comptroller, OCCmlC, 6 Sep 55. Mr. Strother is FIA and ASF project officer for the CmlC. (2) See CmlC Hist Off, Summary of Major Events and Problems, FY 1954, for a fuller discussion of the establishment of the ASF. (3) AR 37-60, 5 May 54, gives the detailed aims of the ASF.

ASF as they visited Washington, Baltimore, New Cumberland (manual accounting system), and Memphis (machine accounting). After this instruction, the Chemical Corps again called on contractual assistance,[56] and sent personnel overseas to help the theaters install Army stock funding. (UNCLASSIFIED)

By 1 July 1955, the Financial Inventory Accounting manual had been approved and published with world-wide distribution. By the same date, the group working on the final ASF manual had nearly completed its monumental task. At the close of FY 1955, future plans included another twenty posts, camps, and stations in CONUS due to go under FIA on 1 January 1956, plus one more overseas command, in addition to the seven theaters already covered.

Throughout the FIA and ASF programs, two big problems were continually encountered. One of these was time, always too short for a task of such magnitude; the other was the personnel shortage in terms of the right quantities and sufficient capability. (UNCLASSIFIED)

Integrated Accounting

One of the preliminary steps to Integrated Accounting was scheduled for 1 July 1955. AR 10-216 and AR 10-50 provided that the Chemical Corps should assume responsibility for finance services throughout the Corps. This involved taking over disbursing offices at Class II installations as well as some Finance Offices, U.S. Army (e.g., Denver). The Chemical Corps

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56 The Chemical Corps had had the assistance of Touche, Niven, Bailey, and Smart, a public accounting firm of New York, in setting up ASF in CONUS. This use of contractor personnel was more for the sake of additional personnel than for any particular skills.

made plans to set up the following eight disbursing offices: Pine Bluff, Rocky Mountain, Dugway Proving Ground, Camp Detrick, Army Chemical Center, Chemical Corps Materiel Command, and New York and Chicago Chemical Procurement Districts. All other Chemical Corps installations were to be satellited, for finance services, on either a Chemical Corps disbursing office or on another technical service or continental Army.[57]

(UNCLASSIFIED)

Comptroller Organization

The publication of CCR 10-20 on 16 March 1955 established a guide for organization of comptroller offices at OCCmlO, field commands, and installations.[58] The Chemical Corps took this action to comply with the legal requirements for consistency in comptroller organizations contained in Title IV, P.L. 216, 1949, and the concept of the Assistant Secretary of Defense (Comptroller) that "financial and reporting operations for similar type activities need to be consistent throughout the military department -- not just for the sake of consistency but so that information can be summarized and compared, and the best ways of doing things fully exploited. *** Hence, comptrollers with complete packages of comptroller functions and associated staffs... should be established, on a standard pattern, at the technical service, command, and installation

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57 Summary of Staff Conference, OCCmlC, 20 Apr 55.

58 (1) Quart Hist Rpt, Comptroller, CmlC, Apr - Jun 55. (2) DA ltr (file AGAC-C (M)) 321 Comptroller of the Army (19 Jan 55) COMPT-M-T, 21 Jan 55, subj: Organization, Functions, and Staffing of Comptroller offices.

levels!"[59] The Comptroller, OCCmlO, reorganized his office into four branches: (1) Finance and Accounting, (2) Budget, (3) Management Engineering, and (4) Review and Analysis. The Chemical Corps then prescribed that essentially similar organizations be established by command and installation comptroller offices throughout the Corps. (UNCLASSIFIED)

Facilities

By the end of FY 1955 the cumulative value of facilities owned by the Chemical Corps had risen to $195,000,000 from $114,000,000 in 1951. The greatest increase, percentage-wise, had been in research and development facilities, with manufacturing plants running a close second. During the four years 1951 - 1955 some $126,000,000 worth of new construction had received Congressional authorization under the Military Construction Army (MCA) program, but $12,000,000 had been withdrawn and $97,000,000 worth completed. (UNCLASSIFIED)

The FY 1955 Chemical Corps Military Construction Army program was financed, as in FY 1954, from unused obligational authority, as Congress did not appropriate new funds. The Army obtained this money from accrued savings on favorable contracts, projects cancelled because of changed missions, and projects deferrable until FY 1956. Major construction work nearly completed by the end of FY 1955 included a $3,895,000 medical veterinary laboratory and $1,088,000 plant science laboratory at Camp Detrick, an explosion test chamber valued at $369,000 and a utility building to go with it worth $274,000. During the fiscal year the largest completed project was the Chemical Corps Training Command facility at Fort McClellan which included The Chemical Corps School, the headquarters of

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59 Quoted in CmlC Reg 10-20, 16 Mar 55, p. 2.

Compiled by Constr, Sec
Installations Br. OCOmlD
23 July 1955 mjv

Table 4 — Status of Current Chemical Corps Construction [as of 30 June 55]

Military Construction Army

SECTION "A"

PROJECT NUMBER	STATION AND PROJECT TITLE	FY	FUNDS AUTH	CURRENT WORKING ESTIMATE	VALUE OF WORK IN PLACE	PER CENT COMP	EST COMPL DATE	REMARKS
4202-	EDGEWOOD CHEMICAL CENTER							
7	Low Temp Test Chamber (4-10A)	53	38,000	48,000	30,000	92	7/55	
8T	Explosion Test Chamber	53	169,000	169,000	150,000	99	8/55	
8B	Utility Bldg for Explosion Test Chamber	53	216,000	216,000	230,000	99	8/55	
50	EM Service Club	55 FY	43,000	43,000				Delay due to recommended expansion
	Vent Duct System (Bldg 310)	" "	64,000	64,000	59,000	96	7/55	
9A	Biophysics Detection Lab	" "	638,000	638,000	30,000	5	6/56	
4A0	Firing Tower for Carrollton Island	55	50,000					Under design - const award exp for 7/55
3206	CAMP DETRICK, MD.							
2g	Medical Veterinary Lab (MP-1)	51	3,907,000	3,895,000	3,729,000	95	8/55	
2b	Plant Science Lab (C-1)	51	1,087,000	1,088,000	1,004,000	97	8/55	
2k	Spile Prep Bldg (C-2)	54	305,000	316,000	269,000	91	8/55	
3h	Two Classified Bldgs	55	139,000	119,000	96,000	56	7/55	
3J	Two Classified Bldgs	55	129,000	129,000	71,000	63	8/55	
4G	Adds to Existing Water System	52	146,000	167,000	131,000	86	7/55	
8S	Extension of Utilities	52	1,300,000	1,216,000	1,096,000	85	7/55	
8J	Acquisition of land & relocation of W. 7th St.	53	516,000	516,000	386,000	99	7/55	
1S	AF Laboratories	54	6,861,000	6,863,000	1,563,000	30	6/56	
1.1	Decontamination Facilities	55	600,000	600,000			7/56	Const award exp for 7/55
2S	AF Division Biological Labs	52	4,743,000	5,155,000	280,000			Const contract awarded - construction scheduled to begin in July
4087	FORT DIX, NEW JERSEY							
2A	2T Storage Pads	55	265,000	263,000				Advertised for Bids 7/55
A071	FORT PECK, MONT.							
2L2	Control Tower	53	311,000	318,000	29,000	99	7/55	
1J7	Security Building	55	110,000	110,000	80,000	82	8/55	
11H	Fuel Storage Facility	55	120,000	120,000	108,000	97	8/55	
1L3	Extension of Heavy Equipment Shop	55	11,000	15,000	4,000	9	12/55	
1K0	Bowling Center	55	70,000	70,000	4,000	4	12/55	
	Belfry for Chapel		30,000	30,000	800			
- -	Family Housing (30 MCI)		484,000	484,000				Design award 6/15 Const. award scheduled for 9/55 To be advertised along with the sixteen units in the FY 56 Prog.
	OGDEN SYSTEM - UTAH (2,800,000)							
A020								
117	Micro Meteor Bldg (Inc No. 2)	55	140,000	131,000	90,000	83	8/55	
110	Improve AF Target	55	106,000	104,000	39,000	41	8/55	
109	Improve Rd - Baker to Mtg Mtn	55	127,000	122,000	115,000	99	8/55	
108	Improve Road - Baker to AF T -2	55	22,000	22,000	8,000	47	8/55	
104	Water - 1/2 Mile Grid	55	23,000	23,000	5,000	20	8/55	
106	Bivouac Road w/ Command Posts	55	159,000	159,000	132,000	90	8/55	
107	Test Track No. 1	55	1,071,000	1,044,000	675,000	63	8/55	
103	Storage House	55	117,000	117,000	86,000	81	9/55	
102	Micro-Meteor Bldg (Inc No. 1)	55	81,000	81,000	59,000	73	9/55	
101	Micro-Meteor Network	55	922,000	922,000	161,000	18	9/56	
A043	RTO [illegible], ALASKA							
	Chemical Test Center	55	458,000	465,000	71,000	16	10/55	Weather conditions in Alaska have held up construction; however it is anticipated that construction will speed up during the summer months.
A015	FORT HUACHUCA, ARIZ.							
71	BW and CW Testing Lab	55	87,000	87,000	84,000	98	7/55	
A005	FORT MCCLELLAN, ALABAMA							
12	Battalion Headquarters	52	79,000	82,000	77,000	95	7/55	
11H	Motor Repair Shop	52	57,000	67,000	51,000	94	7/55	
13T	Mess House	52	3,700	3,700	3,600	97	7/55	
12B	Dispatcher's Office	52	3,200	3,100	3,100	95	7/55	
13	Regimental Headstands	52	36,000	33,000	30,000	90	7/55	
19	Obstacle Area	52	5,100	4,200	4,300	58	7/55	
21	Fencing - 6000 LF	52	3,800	3,800	3,600	15	7/55	
29	Wash Rack	52	1,900	2,100	2,100	97	7/55	
27	Service Club	52	238,000	260,000	190,000	75	7/55	

TOTAL VALUE OF MCA Projects Currently Under Construction — $26,525,600
TOTAL VALUE OF WORK IN PLACE (as of 30 Jun 55) — 11,910,100

Balance of construction to be completed — $ 14,615,600

SECTION "B"

Status of Current Chemical Corps (PPVP) Construction

STATION AND PROJECT	AMOUNT APPROVED	DATE APPROVED	PER CENT COMP	EST COMP DATE	REMARKS
REDSTONE ARSENAL					
Misc Modification and Repl	$ 44,900	7 November 54	85	8/55	

the Chemical Corps Training Command, and two 500-man barracks, a Radiological Defense Laboratory, and field instruction classrooms. Table 4 to this report shows the year-end status of all incompleted construction under both MCA and Provision of Production Facilities Funds (PPFF) allocations. In October 1954 the Chemical Corps Muscle Shoals Chlorine Plant, a Chemical Corps reserve facility, was sold to the Diamond Alkali Company under national security provisions which insure control of the product to the Chemical Corps in event of mobilization.[60] (UNCLASSIFIED)

The major portion of the FY 1956 Military Construction Army program was already under construction at the end of the year. Of the $8,500,000 total, only $500,000 remained to be awarded for such work as storage pads and open storage facilities at Rocky Mountain Arsenal, a decontaminating facility at Camp Detrick, and the Enlisted Men's Service Club at Army Chemical Center. As bids for thirty family units at Dugway were considered excessive, it was planned to re-advertise these units, together with between more from the 1956 program, in the hope of obtaining more favorable bids.[61] (UNCLASSIFIED)

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60 (1) Quart Hist Rpt, Materiel Div, CCCmlO, Oct - Dec 54. (2) Interv, Hist Off with Mr F G DeAngelis, Mat Div, CCCmlC, 1 Sep 55.

61 See Table 4 and Appendix A, pp. 90 - 91.

[redacted]

RESEARCH AND DEVELOPMENT IN THE CHEMICAL CORPS

Chemical Corps research and development activities were carried out under the Department of the Army research and development program, which ordered that increased emphasis be directed to the use of atomic weapons, of biological agents and chemical agents, and carriers thereof, suitable for employment in land combat.[62] The project program, under which Chemical Corps Research and Engineering Command (RECOM) carried out its work, included 42 projects and 116 subprojects in chemical warfare (CW), 26 projects in radiological warfare (RW), and 1 project and 4 subprojects in BW. The number of projects was considerably less than in FY 1954, the decrease being brought about by orders from the Army Research and Development Review Board to consolidate similar or related projects into single projects for the purpose of simplifying the budget and the review procedure. But while the number of projects decreased, a large number of subprojects was established; and the volume and value of the tasks carried on within the Corps in no way decreased. [redacted]

The funds obligated for research and development (R&D) came to $42,850,000.[63] Of this $20,879,000 was spent on CW - RW, and $22,966,000 on BW. The total amount obligated was close to the amounts for FY 1952

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62 Department of the Army Research and Development Program for FY 1955, as revised by change order No. 1, dated 25 Feb 54.

63 All figures are from Review and Analysis of Chemical Corps Program, 4th Quarter, FY 1955.

[redacted]

the Chemical Corps Training Command, and two 500-man barracks, a Radiological Defense Laboratory, and field instruction classrooms. Table 4 to this report shows the year-end status of all incompleted construction under both MCA and Provision of Production Facilities Funds (PPFF) allocations. In October 1954 the Chemical Corps Muscle Shoals Chlorine Plant, a Chemical Corps reserve facility, was sold to the Diamond Alkali Company under national security provisions which insure control of the product to the Chemical Corps in event of mobilization.[60] (UNCLASSIFIED)

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RESEARCH AND DEVELOPMENT IN THE CHEMICAL CORPS

Chemical Corps research and development activities were carried out under the Department of the Army research and development program, which ordered that increased emphasis be directed to the use of atomic weapons, of biological agents and chemical agents, and carriers thereof, suitable for employment in land combat.[62] The project program, under which Chemical Corps Research and Engineering Command (RECCM) carried out its work, included 42 projects and 116 subprojects in chemical warfare (CW), 26 projects in radiological warfare (RW), and 1 project and 4 subprojects in BW. The number of projects was considerably less than in FY 1954, the decrease being brought about by orders from the Army Research and Development Review Board to consolidate similar or related projects into single projects for the purpose of simplifying the budget and the review procedure. But while the number of projects decreased, a large number of subprojects was established; and the volume and value of the tasks carried on within the Corps in no way decreased. [redacted]

The funds obligated for research and development (R&D) came to $43,850,000.[63] Of this $20,879,000 was spent on CW - RW, and $22,966,000 on BW. The total amount obligated was close to the amounts for FY 1952

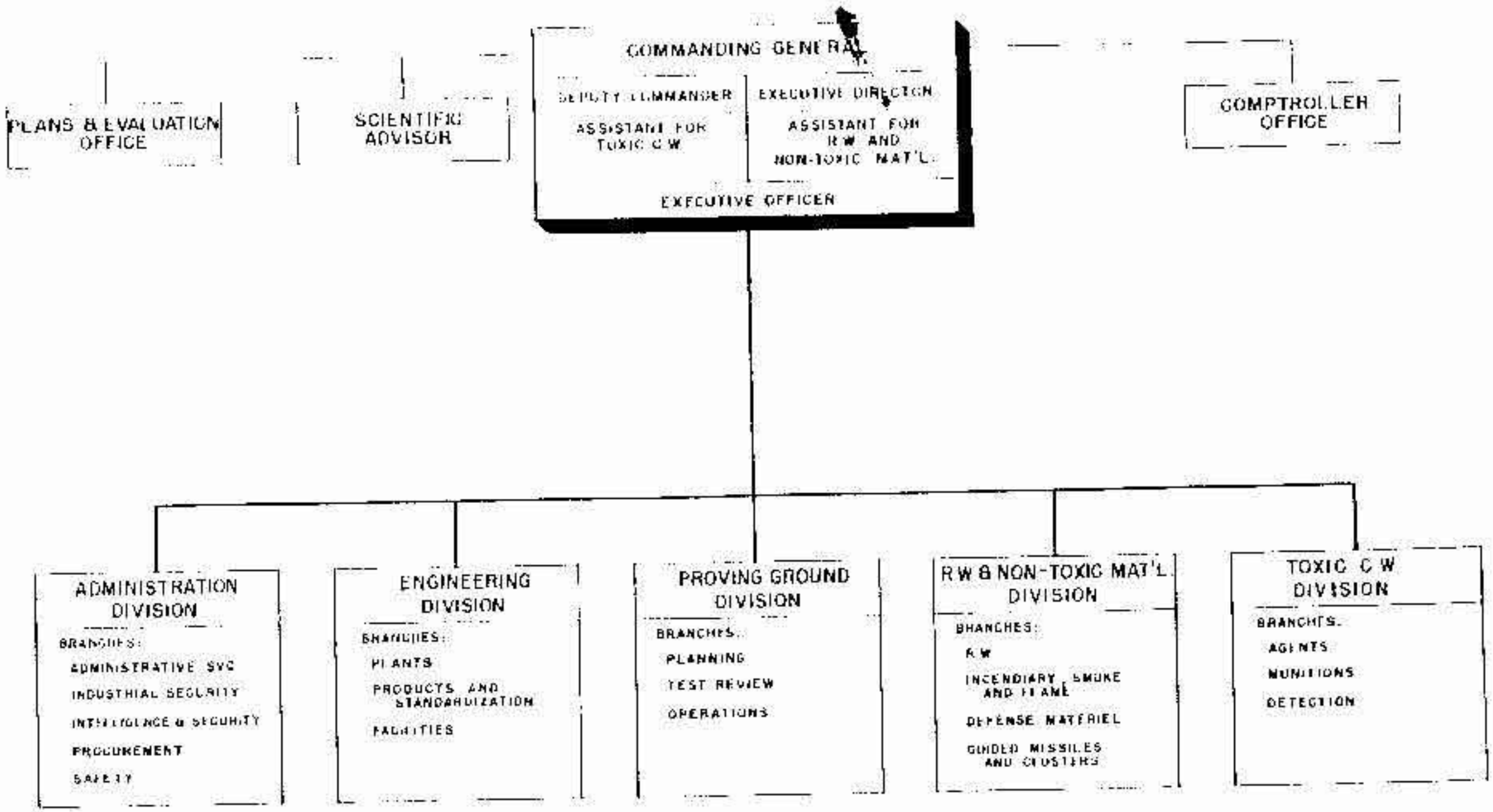
62
Department of the Army Research and Development Program for FY 1955, as revised by change order No. 1, dated 25 Feb 54.

63
All figures are from Review and Analysis of Chemical Corps Program, 4th Quarter, FY 1955.

[redacted]

CHEMICAL CORPS

HEADQUARTERS CHEMICAL CORPS RESEARCH AND ENGINEERING COMMAND



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($38,709,000), FY 1953 ($44,700,000), and FY 1954 ($45,316,000). While these figures show that the money available for R&D has remained relatively constant over the past four years, the volume of R&D which has been carried on with this money has, because of two factors, slowly decreased. First, there has been a constant increase of from 1.5 percent to 2 percent in the cost of supporting the program each year. Secondly, there has been an increase of from 25 percent to 30 percent in the cost of equipment and supplies since 1950. To overcome this continual reduction in the volume of R&D, the Corps requested more money for FY 1956. This was not granted. (S)

Chemical Research and Development

The Chemical Corps laboratories constantly synthesize new compounds which theoretical studies or information submitted from outside the Corps indicate may be more effective than the present standard agents. Recently, by modification of the "electronegative" group of G-agents, there have been synthesized several phosphorus compounds which show considerable promise as quick-acting persistent agents, and which, in time, may replace the G-agents for general field use. These compounds were designated as Candidate CW Agents and upon recommendation of the Advisory Committee on New CW Agents, were given the following symbols:[64]

64 CCTC Item 3036, Symbols for Candidate V-agents, 30 Jun 55.

S

Name	CRL Identifying Number	Symbol
O,O - Diethyl S-2-diethyl-aminoethyl phosphorothioate	1508	VG
3- pyridyl 3,3,5-trimethyl - cyclohexyl methylphosphonate	1511	VP
O-ethyl S-(2-diethylaminoethyl) ethylphosphonothioate	1517	VE
O-ethyl S-(2-diethylaminoethyl) methylphosphonothioate	1664	VM

(SECRET)

These compounds are similar to the G-agents in their physiological action, but are much more toxic when they come in contact with the skin. With rabbits, for example, the percutaneous toxicity is several hundred times greater than GB. VE, when dispersed as an aerosol, is much more toxic than GB vapor. (SECRET)

At the Chemical Corps Chemical and Radiological Laboratories (C&RL) methods have been devised for the quantitative estimation of the V-agents, and progress has been made in devising methods of synthesis suitable for large scale production. A variety of investigations on the physical and chemical properties of the compounds have been made, and the following significant facts were uncovered; VP is stable in steel containers at 71°C, but VG and VE are not; VG and VE penetrate clothing easily, but VP does not. The major emphasis has been placed on VE, and several pounds of the compound were prepared for use in the research program.[65] (SECRET)

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65 (1) Quart Hist Rpt, C&RL, Apr - Jun 55. (2) Quart Hist Rpt, C&RL Jan - Mar 55. (3) CCTC Item 3059, Establishment of Subproject 4-08-03016-04, V-agents, 30 Jun 55.

Although in recent years the major emphasis in chemical research has been to produce compounds which are more lethal than the standard agents, there has been an increasing interest in the possibility of synthesizing compounds capable of causing temporary mental and/or motor incapacitation of enemy soldiers or civilians. In 1949 L. Wilson Greene, Technical Director of CWL, prepared a preliminary report "Psychochemical Warfare - A New Concept of War,"[66] in which the possible applications of psychochemical agents were outlined. Psychochemical agents were defined as compounds which affect adversely the human mind, and/or produce physiological effects which in turn cause psychological disturbances. Literature studies were then made to compile a basic list of abnormal mental and physical symptoms of possible military significance, and to select the most promising fields of investigation leading to the compounds capable of affecting the mind. Three classes of compounds were chosen for investigations lysergic acid and its indole derivatives, the tetrahydrocannabinol series, and the phenethylamines and related substances. (S)

In May 1955 the Corps established a new subproject, "4-08-03-016-05, Psychochemical Agents," with the short title, MM-1605, to uncover and develop promising agents. The military characteristics stated that the desired agent should act promptly, preferably in less than one hour; that it was desirable,

66 CRL Report [redacted] 1500 - 1

but not essential, that it have no permanent effects; that it should have a potency at least equal to the nerve gases; that it should have a low toxicity, be stable in storage, and be capable of being disseminated from airplanes under all environmental conditions.[67] Under this subproject, compounds were to be synthesized, and then screened to ascertain their value in causing symptoms of delusion, hallucination, mania, delirium, psychosis, depression, suicidal tendencies, paralysis, incoordination, convulsions, listlessness, weakness, headache, nausea, dizziness, defects in hearing, sight or judgment, and cutaneous disorders like urticaria. From leads which arise as a result of screening or from further literature study, it is hoped that compounds having the desired properties will be uncovered. (SECRET)

The chemical warfare agents which have received the greatest emphasis since World War II, the G-agents, still offer problems of large scale production. Present production facilities for Agent GB are based on the DMFP (dimethyl hydrogen phosphite) process. This process consists of five consecutive reactions, the first three of which result in the formation of the intermediate compound called dichlor (methylphosphonyl dichloride), and the last two of which result in GB. The first three steps are carried out at Muscle Shoals, the last two at Rocky Mountain Arsenal.[68] (SECRET)

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67 CCTC Item 3060, Establishment of Subproject 4-08-03-016-05, Psychochemical Agents (C); Short Title - MM 1605 (U), 30 Jun 55.

68 The production of dichlor and GB is discussed under Accomplishments and Problems in Toxic Production, see below pp. 138 ff.

In the preparation of GB, C&RL resumed pilot plant investigations of Steps IV and V in an effort to find more effective reaction systems and simpler methods of purification. This work will probably establish the maximum yield that may reasonably be expected and may point out methods for attaining increased yield and improved quality of GB.[69] (S)

An investigation of alternative processes, which may possibly be more efficient on a large scale than the DMHP process, has been under way for some time. A critical evaluation of these methods narrowed the alternative processes down to two, the HTM (high temperature methane) and the Salt process. A pilot plant study of the five-step Salt process led to the conclusion that any attempt to use the process on a large scale would be as technically difficult as the present DMHP process.[70] A pilot plant study of the HTM process is being carried out. A potentially interesting modification of the DMHP process, consisting of a reaction between the product of Step I of the HTM process with the product of Step II of the DMHP process to form dichlor, is being investigated. This process promises greater efficiency than the DMHP process, with less by-product, and may supersede the current DMHP process. (S)

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69 Draft C&RL Special Report, Significant Accomplishments, Fiscal Year 1955.

70 (1) Ibid. (2) CRLR 335, Project 4-92-03-012, Step V Salt Process for Manufacture of GB, Discussion of Work by C&RL, 11 Aug 54.

[redacted]

During the fiscal year a munition intended for the dispersal of GB, a 1000-lb. cluster (E101R5), was standardized as the M34A1.[71] This cluster had been under development since 1951.[72] It consists of 76 M125A1 (E54R8) 10-lb. bombs, each containing 2.6 lbs. of GB, held together by an M29 (E43R1) [redacted] Adapter. A closely related 1000-lb. cluster (E101R3) was simultaneously adopted as Limited Standard, M34. (C[redacted]L)

In one of its important areas of responsibility, screening smokes, the Corps in April 1955 standardized an improved pulse jet smoke generator, the M3A2.[73] The previous standard model, the M3A1, had been accepted for military use in December 1953, replacing the original pulse jet generator, the M3. The M3A1 saw considerable operational use and was tested over a wide range of climatic conditions and terrain by the Corps and by the Army Field Forces. As a result of these tests many suggestions for the improvement of parts of the generator were forwarded to C&RL. The changes were made, as far as practical, and the modified generator was tested at the Army Chemical Center and Dugway Proving Ground. The results of these tests were sufficiently

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71 CCTC Item 2947, Classification of the Clusters, Nonpersistent Gas Bomb, GB, 1000-lb., M34 (E101R3) & M34A1 (E101R5) as Limited Standard and Standard Types, respectively, 9 Dec 54.

72 CCTC Item 2325, Establishment of Project 4-04-15-022, 1000-lb. Cluster of GB Bombs, 25 May 51.

73 CCTC Item 3031, Classification of Generator, Smoke, M3A2 as a Standard Type and Reclassification of Generator, Smoke, M3A1 to Limited Standard, 19 Apr 55.

impressive to justify a recommendation that the device be adopted as the standard model. A few other changes, such as the substitution of black iron in place of inconel, a critical material, are still being investigated, and the M3A2 may evolve further into a still more improved generator. (CONFIDENTIAL)

During World War II there were introduced into warfare devices which utilized microwave and infrared radiation for the observation of targets not visible or only partially visible to the naked eye. The success of radar and infrared devices made it imperative that methods be developed to obstruct or scatter or attenuate these waves and thus shield potential targets from enemy eyes. Following the war the Corps began the investigation of smokes and materials which might possibly serve as anti-radar and anti-infrared devices. Early in 1954 the Army Field Forces reviewed the work being done by the Corps, and came to the conclusion that the agents under development offered greater promise than any then available.[74] As a result of this review the Corps has placed greater emphasis on this field. (SECRET)

The anti-infrared devices produce smoke which scatters and absorbs infrared rays, just as chemical smoke from pots and fog oil smoke from mechanical generators disperse visible light rays. Several agents and methods of dissemination were investigated. The most promising chemical smoke was produced by Agent E11, a mixture of silicon tetrachloride and ammonia. When

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74 Ltr, CAFF to ACofS G - 3, 10 Feb 54, subs Anti-Radar and Anti-Infrared Screening Devices.

mixed, these two compounds react, producing several compounds which appear suddenly as a white cloud. Infrared rays impinging on this cloud are scattered and absorbed. Unfortunately, the agent has two drawbacks which appear to be insurmountable; the compounds are corrosive, and no way has been found to produce, at all times, smoke particles of the same, optimum size. An alternative to Agent E11 is black carbon smoke, produced by combustion of a pyrotechnic mixture. This smoke scatters infrared rays, but it does not scatter visible light as satisfactorily as white smokes. The latter property is desirable, and would widen the usefulness of infrared smokes, but it is not absolutely essential. Mechanical generators have been tested as carbon smoke producers, but so far have not been successful. (SECRET)

A new approach is the production of white smoke by the expulsion from a Mars gas turbine of minute, hollow plastic bubbles. The plastic bubbles are produced by the expansion of fine particles of plastic. Plastic smokes have the advantages of having large-size particles, a slow rate of settling, and of forming a large quantity of smoke from a small quantity of starting material.[75] (SECRET)

In the solution of an analogous problem, the scattering of microwave radiation, it has been theoretically proven that smoke screens are useless. The device which was developed is a small dipole, formed by covering glass fibers, one-half inch long and two to ten microns in diameter, with thin

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75 Chemical Corps Annual Research and Development Project Report, Infrared Screening Agents, 31 December 1954.

layers of metal. Bundles of these dipoles dispersed in the air scatter microwave radiation in the same manner as the "Chaff" of World War II. The most promising fibers are those coated with silver, E1CR2, and with aluminum, E1CR3. Both have excellent electrical and physical properties, but the aluminum coated fibers, which have a wavy surface, separate more easily than the silver fibers. This tendency of the fibers to cling together is a problem which has required constant investigation and is not yet solved. Under investigation also are various methods of dispersing bundles of dipoles, including ground-type dispersers and airborne blowers.[76] [redacted]

Until this fiscal year, the only standard main armament-type mechanized flame thrower was the World War II Combat Vehicle Flame Thrower, M5-4, standardized in July 1945. This weapon, with a range of approximately 125 yards and a fuel capacity of 285 gallons, was designed for installation in the M4A1 and M4A3 medium tanks after removal of the gun and other gear. In 1950 the Corps established a project (4-09-02-014) to develop an improved weapon for the newer tank models under development by the Ordnance Corps. Out of this work came the E25-30 Combat Vehicle Flame Thrower, which was designed for installation in the T42 tank. Authorization for the procurement of the E25-30 was granted in 1951 but was not carried out. The reason for this was the development by Ordnance of a new tank, M48, which was better

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76 (1) Chemical Corps Annual Research and Development Project Report, Radar Screening Agents, 31 Dec 54. (2) Quart Hist Rpt, C&RL, Apr - Jun 55.

suited, because of its low silhouette and other improvements, for use as a flame tank. Work on a flame thrower for the M48 was started under a new project (4-09-02-016) in April 1952.[77] (CONFIDENTIAL)

Development of the new weapon progressed steadily, and by FY 1955 the E28-30R1, designed for installation in the turret of the M48 tank, was completed. The flame gun, which replaced the 90-mm. gun in the tank, is operated by the flame gunner sighting through the T39 periscope. It has a range of approximately 200 yards and a fuel supply of 385 gallons. Following the conclusion of tests which proved that the weapon met the requirements of the Marine Corps, the using arm, it was standardized as the M7-6.[78] The M48 tank carrying the M7-6 flame thrower, was redesignated by the Ordnance Corps as the T67 Flame Thrower Tank. (CONFIDENTIAL)

In another area of flame warfare, the development of incendiary bombs, the Corps has continued to improve munitions to keep pace with advances in aircraft. Continuing work on fire bombs for jet aircraft resulted in the standardization of the M116A1 750-lb. bomb. The development of the original 750-lb. bomb began in 1948. At that time the 114-gallon Fletcher fuel tank was chosen as the design for a bomb which became the E74 fire bomb. The

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77

CCTC Item 2452, Establishment of Project 4-09-02-016, Integral Flame Thrower for T48 Medium Tank, 24 Apr 52.

78

(1) CCTC Item 2956, Classification of the Flame Thrower, Mechanized, Main Armament, M7-6 (E28-30R1) as a Standard Type and Component of the T67 Flame Thrower Tank, 9 Dec 54. (2) Chemical Corps Board Project 887, Test of Integral Flame Thrower Tank, T67.

E74 was finally standardized as the M116 in July 1953.[79] At the request of the Air Force, the Corps began investigation of a simplified method of assembling the bomb in the field. The original design required inside assembly of the components through hand-holes. The new design enabled the bomb to be assembled more rapidly and economically by external means. This improved bomb was standardized as the M116A1 in December 1954.[80] (UNCLASSIFIED)

The rapid and accurate production of thickened gasoline for fire bombs and other flame weapons requires a mixing and transfer device. The older M2, which was designed for field use in the temperate climates, was developed and standardized during FY 1949 and 1950. Subsequently the device was redesigned to include a heater, which allowed thickened gasoline to be prepared at low temperatures, and a control device, which allowed greater accuracy in preparing mixtures of definite proportions, and was standardized as the M3 in 1952.[81] (UNCLASSIFIED)

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79 CCTC Item 2694, Classification of Bomb, Fire, 750-lb, M116 (E74) as a Standard Type, 15 Jul 53.

80 CCTC Item 2952, Classification of the Bomb, Fire, 750-lb, M116A1 (E74R3) as a Standard Type and Reclassification of the M116 Bomb to Limited Standard, 9 Dec 54.

81 CCTC Item 2524, Classification of Mixing and Transfer Unit, Incendiary Oil, M3(E3R2) as a Standard Type and Reclassification of the M2 unit to Substitute Standard, 9 Sep 52.

The disadvantage of the M3 was the absence of an automatic device which would measure the quantity of agent. An operator with long experience and reliable judgment was needed to obtain thickened fuels having the proper consistency. To correct this defect the Corps began the development of a device which controls the rate of addition of the thickening agent, thus allowing mixtures of any percentage to be prepared. The device is essentially a proportioner which continually adds the proper quantity of agent to the gasoline as the gasoline flows through the mixer. Successful tests by the Air Force, during which the mixer turned out fuels having various percentages of composition at temperatures ranging from -65°F to 105°F, resulted in the device being accepted for military use and standardized in December 1954 as the AN-M3A1, Mixing and Transfer Unit.[82] (CONFIDENTIAL)

A different type incendiary than the fire bomb is the M35 and the M36 750-lb. cluster recently provided by the Corps for the Air Force. The ancestor of this missile is the 500-lb. cluster, two of which, the M31 and the M32, were standardized in 1951. The M31 cluster held 38 10-lb. PTI-filled bombs, the M32 held 108 M50A3 4-lb. TH3-filled bombs. Both of these clusters were procured for use during the action in Korea. (UNCLASSIFIED)

Newer aircraft are designed with larger bomb stations which will hold missiles weighing 750 pounds, and is uneconomical to carry 500-lb. clusters

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82 CCTC Item 2949, Classification of Mixing and Transfer Unit, Incendiary Oil, AN-M3A1 (E3R3) as a Standard Type and Reclassification of the M3 unit to Limited Standard, 9 Dec 54.

in these planes. To supply the Air Force with larger clusters the Corps began in 1951 the development of a new family of 750-lb. clusters suitable for operation with the latest high-speed, high-altitude aircraft. The development of the M36 750-lb. cluster, corresponding to the M32 500-lb. cluster, was started in FY 1952. From several models of new experimental adapters the E53 was judged to be best, and was accepted as a component of the new cluster. The M50A3 4-lb. incendiary bomblet, was too long to be completely stable in flight and had to be modified by decreasing the length of the body and adding extensible fin blades. The new bomblet was designated as the M126(E89). The completed missile, consisting of 183 M126 bomblets held together by a M30(E53) adapter, was designated as the E117 750-lb. incendiary bomb cluster. Extensive tests by the Air Force at Eglin AFB and Edwards AFB uncovered some faults which needed correcting, but the basic design proved to be trustworthy. The final model, consisting of 182 M126 bomblets held together by the M30 adapter, was standardized by the Corps in December 1954.[83] (CONFIDENTIAL)

The development of the M35 750-lb. bomb, corresponding to the M31 500-lb bomb, paralleled the work on the M36. The designers met considerable

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83
(1) CCTC Item 2951, Classificatior of the Cluster, Incendiary Bomb, PTI, 750-lb. M35 (E115R5) and Cluster, Incendiary Bomb, TE3, 750-lb., M36 (E117R2) as Standard Types; Reclassification of the M31 and M32 500-lb. clusters to Substitute Standard, 9 Dec 54. (2) CRLR 378, Final Engineering Test No. 95, Cluster, Incendiary Bomb, 750-lb., E117R2, 25 Jun 54.

difficulty in developing an adapter which would open completely at the proper altitude, releasing the 10-lb. PTI-filled bomblets, but finally a satisfactory model, the M30(E53R3), was obtained. The new cluster contained 57 10-lb. PTI M74(E5R11) bomblets banded together by an M30(E53R3) adaptor. It was standardized as the M35 in December 1954.[84] (CONFIDENTIAL)

Biological Warfare Research and Development

The biological warfare laboratories at Camp Detrick, Md., constantly investigate agents which may be more effective than the agents that are standardized. During FY 1955 three new organisms were chosen for screening. These were the virus of Japanese type B. encephalitis, Richettsia rickettsii, the cause of Rocky Mountain Spotted Fever, and Variola virus, the cause of smallpox. The screening of Rickettsia prowazaki, the cause of epidemic typhus, was completed. The two most promising agents in the screening program were Coccidioides immitis, the cause of coccidioidomycosis, and Malleomyces pseudomallei, the cause of meliodosis. In the laboratory phase of investigation was Pasteurella pestis, which will probably be the next agent transferred to the Process Development and Pilot Plant. In the pilot plant at Camp Detrick, B. tularense was under investigation. This agent was being studied for large scale production at Pine Bluff Arsenal.[85] [redacted]

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84 (1) CCTC Item 2951, 9 Dec 54. (2) CRLR 348, Final Engineering Test No. 82, Cluster, Incendiary Bomb, PTI, 750-lb., E115R3, 7 May 54.

85 Annual Status Report (Formerly Technical Estimate) on the DCD BW and CW R&D Program, 10 Aug 55.

The most promising group of the anti-crop agents was that composed of certain esters of 4-fluorophenoxyacetic acid, which are effective against rice, cereal grains, and certain broad-leaved plants. Negotiations were started with industry for the production of these compounds in pilot plant quantities. (SECRET)

The search for new plant pathogens was continued largely by liaison with the U. S. Department of Agriculture, and by studying new outbreaks of plant disease. Final research tests were conducted on a pathogen for rice and a pathogen for potatoes. (SECRET)

As important as the development of agents is the development of immunological and chemoprophylatic measures for the protection of troops and civilians. An important vaccine which has been sought by Camp Detrick scientists had been a new vaccine which would protect humans against anthrax. The old vaccine, which helped to prevent sheep and cattle from contracting the disease, actually caused the disease in a few cases. For this reason the vaccine could not be given to human beings. At Camp Detrick, after research extending over several years, Dr. George Wright developed a new vaccine which does not transmit the disease and may therefore be given to humans. The vaccine was tested on over one thousand people without ill effects, and is currently being assessed among the wool and hair workers in Philadelphia. This vaccine is an important guard against enemy use of anthrax as a BW agent

in any future war.[86] (SECRET)

The development of agents is but one phase of the Corps' BW program. Satisfactory munitions which are capable of delivering the agents are also under constant development. In 1953 the Corps inaugurated the ST. JO program to determine the potential military worth of selected agent-munition combinations, with particular emphasis on the E61R4 1/2-lb. bomblet filled with Agent N. In this program Agent N and the bomblets were developed under high priority, a large quantity of the bomblets were procured and filled, and the munitions were tested logistically and operationally. In FY 1955 the original program was successfully completed. The only tasks remaining were a few supplementary tests, such as cold weather test and additional field assessments.[87] (S[redacted]

In the past, plans for biological warfare had been carried out under the assumption that humans were susceptible to BW agents. This assumption was based on two facts; the medical evidence that man was susceptible to the

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86
(1) Draft of Speech, "The Role of Science for Peace and National Security" by Maj Gen William Creasy, before the Western N. Y. Section of the ACS, 18 Jan 55. (2) Annual Chemical Corps Research and Development BW Project Program, 31 Dec 54.

87
(1) The Ralph M. Parsons Co. Special Assessment Branch Report No. 3 Summary Report of the ST. JO Program. (2) Annual Chemical Corps Research and Development BW Project Program, 31 Dec 54. (3) Fourth Quarter FY 1955 Program Review - Primary Program 158, Chemical Corps BW Program.

diseases in question, and experimental evidence from the use of BW munitions on animals. In October 1954 the Chief Chemical Officer, in order to comply with directives from G - 4 and DOD, directed Camp Detrick to initiate plans to obtain direct experimental evidence concerning the susceptibility of troops in the field to BW infection.[88] Because of the urgent nature of the work, the specific results desired, and the nature of the experiments, which required volunteers, a new project was set up and given 1-A priority.[89] (S)

The experimental work was divided into four phases. In the first phase data on the infection of animals were determined in the test sphere. The second phase repeated the experiments on humans. Phase three determined the infectivity of animals in the field, and phase four was to determine the infectivity of volunteers in the field. At the end of the FY 1955 the Corps had completed the first three phases. The fourth phase was awaiting permission from the Secretary of the Army, which is necessary before volunteers may be used.[90] (S)

Radiological Research and Development

One of the most important defensive measures which the Corps investigated was the protection of civilians and soldiers by means of a smoke screen,

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DF, CCmlO to ACCmlO/BW, 21 Oct 54, sub: Procurement of Extrapolation Data.

89

CCTC Item 2963, Establishment of Project 4-11-01-005, Vulnerability of Military Personnel to BW Attack, 9 Dec 54.

90

Fourth Quarter FY 1955 Program Review - Primary Program 15B, Chemical Corps BW Program.

against the intense heat evolved during the explosion of an atom bomb. Of the three destructive forces, unleashed by a bomb, radiation, heat, and blast, the effect of heat is felt over the widest area. Not only are casualties caused directly by the heat, but indirectly through fires resulting from the explosion. At Hiroshima, for example, an area of three square miles was affected by radiation and blast, but an area of sixteen square miles was affected by heat. More than half the casulties were caused by burns from the bomb or from fires started by the bomb. The smoke thrown out by a mechanical generator contains myriads of minute droplets of fog oil which disperse and absorb heat from a bomb, just as the droplets of water in a cloud scatter heat rays from the sun. (SECRET) (RD)

The project to determine the degree of protection afforded by fog oil smoke against atomic heat was started in 1952.[91] The University of Michigan collaborated with C&RL in making a theoretical and experimental analysis of smoke protection. At Operation KNOTHOLE, an atomic blast set off in the spring of 1953, the fog oil screen from remote controlled M3 smoke generators reduced thermal radiation by approximately 85 to 90 percent.[92] The success of smoke screen protection indicated the feasibility of decreasing the damage in

91
Project 4-12-10-007-01, Thermal Radiation Cloud Study.

92
Lt Col C S Brice, Jr, Preliminary Calculations on the Effectiveness of Smoke at Operation KNOTHOLE, 1953, CRLR 120.

the large American cities and important industrial areas which would be the prime targets for enemy bombers in case of war. To determine if protective smoke screens were practicable in urban areas, a project was carried out by Stanford University to collect meteorological data on large cities. Detailed studies of such cities as Los Angeles, Chicago, and St. Louis showed that it was feasible to shield the cities with smoke 75 to 86 percent of the nights and 34 to 64 percent of the days during the year.[93] (S[redacted]) (RD)

The shielding of 106 American cities with populations over 100,000 would require an extremely large number of generators. A study of the logistics involved in civil and military defense was begun and was continuing at the close of the fiscal year. (S[redacted]) (RD)

While Operation KNOTHOLE indicated that the smoke generator was potentially of considerable value against the atom bomb, the Corps needed a larger, more elaborate test to confirm the earlier results and to extend its knowledge of thermal attenuation. The opportunity came on 12 March 1955, when a full scale experiment was carried out at Operation TEAPOT. An atom bomb having a 3.6 kiloton yield was detonated on top of a steel tower 300 feet high. A fog oil smoke screen having a concentration of approximately 500 gallons per square mile reduced the heat radiation 77 to 90 percent at distances of 1,000 feet to 2,400 feet from ground zero. The significance of this test was so

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93 Stanford Research Institute, Contract DA-18-108-CML-1856, ETF 760/407 FR, TRAC Meteorological Feasibility Final Report, 1953.

important to civil defense that the results were given nation-wide publicity in newspapers on 12 - 13 March 1955.[94] [redacted] (RD)

A different type of device for use in radiological warfare was a radioactive training aid, standardized by the Corps in December 1954.[95] This aid is a small radioactive pellet of Cobalt 60. It is kept in a lead box weighing 150 pounds until it is actually used in training. It is then removed with tongs, which are approximately six feet long, and placed in the area which the trainees will examine. When men holding detectors approach the area, the deflections in the instrument show the presence of the dangerous, invisible radiation. (UNCLASSIFIED)

Defensive Measures

Among the protective devices under development by the Chemical Corps were gas masks for individuals, collective protectors for groups, and protective coverings. Progress was made with each of these items. (UNCLASSIFIED)

With individual protectors, the most important advance was the choice by the Army Field Forces of the canisterless mask, the E13 type, for further intensive development as a possible successor to the standard M9A1 mask.

94
(1) Draft CRL Special Report, Significant Accomplishments, Fiscal Year 1955. (2) CRLR 466. Elmer H Engquist, Charles Forsthoff, Benjamin Barnett, J J Mahoney, Interim Comprehensive Report on Thermal Radiation Attenuation by Oil-fog Smoke Screens.

95
CCTC Item 2957, Classification of the Training Aid, Radioactive Source, M3 (E13R1) as a Standard Type, 9 Dec 54.

Work on a new mask has been under way since 1952, and for the purposes of field tests the Corps was able to present the AFF with four experimental models. Out of these four the AFF decided that the E13, which filters incoming air through gas-aerosol filter pads located on both cheeks, offered the most promise. The E13 offers the same excellent protection as the M9A1 mask, but offers only one-half the resistance to breathing. On the other hand, one disadvantage is the shorter length of protection, which is only one-half the time of a mask fitted with the M11 canister. It is expected that final development tests of the candidate mask will be completed by January 1957.[96] (SECRET)

During the year two standard collective protectors were improved by the Corps. The first of these was the M7 Six-Man Hospital Protector, which consisted essentially of an electric motor-driven air purifier providing two cubic feet of air per minute to six bedridden men. A new motor, capable of operating on both AC and DC, and a modified air purifier, which simplifies production, operation, maintenance, and storage, were installed, and the unit restandardized as the M7A1.[97] (SECRET)

The second modification took place with the M8 Three-Man Tank Protector which was designed to protect tank crews against CBR agents and which, in ordinary war or peace operations, acts as an air conditioner by removing dust and gas fumes from the air. The air purifier, which is the same as in the M7

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96 (1) Draft CRL Special Report, Significant Accomplishments, Fiscal Year 1955. (2) Chemical Corps Annual Research and Development Report, 31 Dec 54.

97 CCTC Item 3027, Classification of Protector, Collective, Hospital, Six-Man, M7A1 (E27R2), and Protector, Collective, Tank, Three-Man, M8A1 (E25R2) as Standard Types; Reclassification of the M7 and M8 Protectors to Limited Standard Types, 19 Apr 55.

Hospital Protector, led to standardization of the improved model as the M8A1.[98] (SECRET)

A protective covering which was made available during the year was the M1 Horse Cape.[99] The development of this item began under low priority ten years ago, was stopped in 1948 from lack of funds, and was finally resumed. This cape will be used by the Army to protect horses and mules from vesicant agents sprayed by aircraft. (SECRET)

An area in which the Corps constantly sought to improve methods of protection concerns the neutralization or decontamination of agents. Of particular recent significance was the development of a new decontaminating solution which, as ordinarily used, is non-toxic, non-flammable, and non-corrosive to the important metals, steel, aluminum, magnesium, copper, and brass. Furthermore, the solution does not solidify until the temperature drops to - 30°F, and thus can be used in cold climates. The solution, which consists of diethylene triamine, butyl cellosolve, sodium hydroxide and water, reacts with, and thus decontaminates surfaces spattered with, mustard, lewisite, G-agents, and some of the new V-agents. A disadvantage of the solution is its solvent action on paint.[100] (SECRET)

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98 (1) Ibid. (2) CRLR 190, Protector, Collective, Tank, 3-Man, E2S.

99 CCTC Item 2941, Classification of the Cape, Horse, Protective, M1 (E3R12) as a Standard Type, 9 Dec 54.

100 Draft, CRL Special Report, Significant Accomplishments, Fiscal Year 1955.

Plans

Combat Developments

In FY 1955 the Plans and Operations Branch of the Office of the Chief Chemical Officer was reorganized to meet the new emphasis by Department of the Army on combat developments. The Haworth Report (Ad Hoc Committee on Combat Developments) which appeared on 20 October 1954, pointed out certain deficiencies in the existing structure of the Army combat developments system.[101] With the creation, on 1 February 1955, of a central military command, known as Headquarters, Continental Army Command, over all six continental armies and the Military District of Washington, a new central agency was established within CONARC to head up the Army Combat Developments organization. Some idea of the importance of combat developments may be deduced from the fact that the Deputy Commanding General, CONARC, Lt. Gen. N. G. Wyman, headed this agency. The Assistant Chief of Staff, G - 3, set up a staff section in his office to coordinate the

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[101] The need for a combat developments system had been brought about by the many technological advances during World War II and thereafter, so that the Army had to be sure that research and development agencies were working along the right lines. The mission of the combat developments system and the definition of combat developments was given as "The research, development, testing, and early integration into units in the field of new doctrine, new organization, and new materiel to obtain the greatest combat effectiveness, using the minimum of men, money, and materials." (See Combat Developments Objectives Guide, Hq, Continental Army Command). A basic problem in the accomplishment of this mission was to identify combat developments objectives and to provide coordination and direction to the attainment of them.

inter-related problems and activities of the combat developments organization.[102] ([redacted])

While attending a conference at CONARC in early March 1955, the Chief Chemical Officer was briefed on a CONARC study on combat developments which pointed out the inadequacy in scope and magnitude of the Army's combat development and the need for definite improvement. One recommendation of this study was that the chiefs of technical and administrative services should designate a single existing agency as responsible for combat development activities of that service. Such an agency would maintain direct and informal liaison with CONARC, and the latter would provide information as to the general objectives of the combat development program as well as specific operational, organization, and equipment development projects as required.[103] (UNCLASSIFIED)

General Creasy immediately directed the reorganization of Plans and Operations Branch into a Plans Branch consisting of two sections, Planning and Combat Developments.[104] The Combat Developments Section was created on a 90-day trial basis because the Chemical Corps had not

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(1) Except where otherwise cited, material in this section is based on quarterly historical reports, Plans, Training, and Intelligence Division, OCCmlO, for FY 1955. (2) C 7 SR 10-5-1, 1 Feb 55.

103
Interv, Hist Off with Lt Col Benjamin R Bierer, C Plans Br, PT&I Div, OCCmlO, 24 Aug 55.

104
DF, C PT&I Div to C Admin Div and Comptroller, OCCmlO, 17 Mar 55, sub: Reassignment of Personnel.

received formal direction for the establishment of such an organization, and Civil Service Commission regulations prohibited detailing of civilians for a longer period. Lt. Col. Edwin G. Pike was made chief of the new section and provided with a detail of two officers and two civilians. As a calculated risk, the Chief of Plans, Training, and Intelligence Division cut Training Branch personnel strength in order to strengthen Combat Developments.[105] One aspect of this cut was the transfer of the nuclear effects engineer from Training Branch to Plans Branch because his work was actually focused in the field of combat developments.[106] Combat Developments Section nevertheless remained short of personnel and had to call upon other Chemical Corps agencies, such as the Chemical Corps Board and the Doctrine Division of the Chemical Corps Training Command, for some of the studies requested by CONARC. Formal direction for the designation of a particular element of the Chemical Corps to maintain liaison with CONARC Combat Developments Organization did not come during FY 1955.[107] (UNCLASSIFIED)

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105 Interv, Hist Off with Col Frank M Arthur, C PT&I Div, OCCmlO, 6 Sep 55.

106 Interv, Hist Off with Maj T B Flynn, Combat Developments Section, Plans Br, PT&I Div, OCCmlO, 17 Aug 55.

107 (1) The Chemical Corps received this formal direction on 26 July 1955, and the Chief Chemical Officer designated Plans, Training, and Intelligence Division as the responsible element. Special responsibility was placed on Combat Developments Section. (2) Ltr (AGAM-P (M) 381 (19 Jul 55) CS), Sec Army to TAG, PMG, et al., 26 Jul 55, subj: Combat Developments Organization. (3) Ltr, CCmlO to CG CONARC, 5 Aug 55, same sub.

Plans and Studies

Personnel of Plans Branch continued to work on the Chemical Corps Mobilization Plan IV throughout FY 1955. This plan supports and provides detailed instructions for carrying out the responsibilities of the Chemical Corps under the Army Mobilization Plan IV (AMP IV).[108] The CBR Annex to a proposed Army Long-Range War Plan, with an assumed D-Day of 1 July 1965, was finished in January 1955. The proposed plan was to be used to develop strategy for the prosecution of a general war beginning on that date. The plan made the important assumption that by 1965 the nuclear capabilities of the United States and the Soviet Union would cancel out, because each could inflict critical damage on the war potential of the other. The annex further assumed that the United States would not be bound by a "retaliation only" policy, and therefore considered such subjects as how CBR agents could be used to military advantage, the chemical support required and type of units, supply tonnages per day under CBR warfare conditions, intelligence requirements, and research and development requirements.[109] [redacted]

At the direction of G3, Plans Branch co-ordinated the preparation of a study on the comparative effectiveness of chemical versus atomic weapons in an attack on a selected Far East target area. Among other plans and annexes prepared by the Chemical Corps during FY 1955 were such plans as the Chemical Requirements Annex to DA-SL-8A, which contained the requirement for chemical units and Class IV material generated by the projected operations plan to hold on the present line

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108 Interv, Hist Off with Mr E H Stabler, Plans Br, PT&I Div, OCCmlO, 24 Aug 55.

109 Summary of Staff Conference, OCCmlC, 5 Jan 55.

[redacted]

in Europe and reinforce for the attack. Just prior to the uneasy peace in Indo-China the Chemical Corps was called upon to produce a plan for the support of American forces in that country should national policy dictate armed intervention. Similar plans were made for operations in active defense of Formosa.[110] On a more optimistic note, the Chemical Corps submitted an estimated detailed troop program for a peacetime army of 578,000, of which number 3,658 would be in Chemical Corps T/O&E units.[111] [redacted]

The branch also reviewed a DA draft of the Army Strategic Capabilities Plan and completed DA-SL-16 which was a plan for an eighty-six division attack into the heart of the Soviet Union from bases in Turkey and the Balkans.[112] [redacted]

The branch completed the Chemical Corps contribution to the study Project LINEUP. This study involved the determination of requirements for DA personnel and material to support the civilian defense structure in order to rehabilitate the United States after an all-out enemy atomic and thermo-nuclear attack.[113] [redacted]

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110 Stabler interv.

111 (1) Memo, C PT&I Div for CCmlO, 20 Jul 54, sub: Peacetime Army Program (FY 1954). (2) DF, CCmlO to ACofS G - 4, 29 Jul 54, sub: Peacetime Army Troop Program.

112 PT&I Review & Analysis Presentation, 4th Quart FY 55. 23 Aug 55.

113 Ibid.

During FY 1955 at the direction of G - 3 the Chemical Corps, the Signal Corps, and the Corps of Engineers made an operational study on the significance of massive radiological fall-out. The Chemical Corps Board received responsibility for the conduct of the Chemical Corps' portion of the study with the assistance of other agencies of the Corps. The study, which began in July 1954, was completed by December, and in February G - 3 directed a further study requiring analysis of 800 potential enemy targets in terms of radiation hazard and effect.[114]

The Chemical Corps attempted to reconcile two basic Department of the Army policies which were in conflict in FY 1955. The very important problem confronting the Chemical Corps was the proper utilization of substitute and limited standard protective masks. The two conflicting policies were (1) the policy of using the oldest items in storage first in order to keep fresh supplies in warehouses and to make economical use of appropriations, and (2) the policy of providing American troops in overseas and other critical areas with the latest in supplies and equipment. The latter policy depleted stocks of the M9A1 standard gas mask more rapidly than stocks of limited and substitute standard masks, which meant that the U.S. war reserve of protective masks had a steady percentage increase of non-standard items, and the latter often literally rotted on warehouse shelves. The action of G - 4 in halting procurement of the standard mask in 1954 produced a critical situation. At that time the war reserve held about 1,000,000 standard masks, and about 3,000,000 limited or substitute

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114 Summary of Staff Conference, OCCmlO, 25 Feb 55.

standard masks.[115] (SECRET)

The Chemical Corps faced the problem of establishing a workable policy for the utilization of all protective mask assets. As the standard combat mask of the U.S. Army was the M9A1, the Chemical Corps considered the resumption of production of these masks as essential not only to replace losses through attrition but also to insure an adequate mobilization production base and issue. In the summer of 1951 the Chemical Corps made a study of the problem and submitted it to the Assistant Chief of Staff, G - 4. This study went into the basis of issue of protective masks and actions taken thereon. The issue of masks had been reduced in 1952 to the following basis:

Overseas	- One (1) per individual
Operational Units in CONUS	- One (1) per individual
Training, CONUS	- One (1) per three (3) individuals
T/D Units	- One (1) per twenty (20) individuals[116]

With the concurrence of the Chief of Army Field Forces, the Chemical Corps sought in March 1954 to restore the 1/1 basis for issue but was turned down by G - 4. Some progress was made in July 1954 when G - 4 granted permission for the issuance of lightweight and snout-type masks on "special issue" basis to each individual in training divisions and replacement training centers. As a solution the Chemical Corps proposed to utilize all limited and substitute standard masks to meet protective mask requirements in CONUS with the exception of Class IV General Reserve. (UNCLASSIFIED)

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115 This section is largely based on interv, Hist Off with Lt Col Martin L Denlinger, AC PT&I Div, OCCmlO, 6 Oct 54.

116 SR 310-30-14, 23 Jun 52.

The gross supply of lightweight and snout-type masks was 1,516,000, of which some 629,000 were in the Far East for the use of the Republic of Korea Army (ROKA) and United Nations' troops. About 505,000 lightweight masks were located in Germany, of which number 150,000 were intended for emergency use by American civilians and dependents. The Chemical Corps took the position that if all such masks (except those in the Far East) were returned to CONUS, there would be a gross supply of 1,072,000 to meet CONUS requirements of 980,000. Maintenance would then be by means of the existing stock of spare parts and by cannibalization. The 150,000 masks intended for non-military personnel in Germany would be replaced by stocks of the M9A1 mask.[117] [redacted]

The Deputy Chief Chemical Officer (Maj. Gen. Charles E. Loucks) approved the study and forwarded it to G - 4. Lt. Gen. Williston B. Palmer, then Assistant Chief of Staff, G - 4, and shortly thereafter Deputy Chief of Staff for Logistics (DEP LOG), gave his verbal approval and later written approval.[118] (UNCLASSIFIED)

General Palmer did not approve the study without reservation. He was insistent that units in the High Priority General Reserve should not be issued limited or substitute standard masks. He also felt that the USAFFE should retain only sufficient nonstandard masks to meet the ROKA

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117 Staff Study, P&O Br, OCCmlO, 20 Aug 54.

118 DF, DCCmlO to ACofS G - 4, 25 Aug 54, sub: Utilization of Non-Standard Protective Masks, and Cmt #2, 20 Sep 54.

requirement of 356,000 plus current allowances.[119] All serviceable and reparable excess would then be returned to CONUS or used to meet MDAP requirements in the Far East. General Palmer specified that post M-Day requirements for American civilians and military dependents in the Far East be met from stocks of M9 series masks. He also insisted that the issue of one mask per individual in training divisions and replacement training centers apply only to the zone of interior.[120] (CONFIDENTIAL)

The new DA policy established two protective mask requirements, one for combat and the other for training. It therefore became necessary to set up appropriate standard and surveillance procedures for the latter which would lower considerably the acceptance standards prescribed in SR 742-507-72. The Chemical Corps also conducted appropriate tests to determine whether the obsolete M2 series and the B6 neoprene assault masks provided adequate protection against training agents. (UNCLASSIFIED)

These tests conducted by the Chemical Corps Board, revealed that the M2 masks, in their original condition, were unsuitable for training purposes, but that by salvaging the facepiece assemblies and using M.CA1 canisters and carriers from stock about 100,000 of the M4 series masks could be assembled. The B6 assault masks were deemed unserviceable because of permanent set in the facepiece which permitted leakage. The Chemical Corps initiated action to dispose of all stocks of B6 masks and to convert existing stocks of M2

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119 See DA mag 963398 for authorization for ROKA.

120 Cmt #2, DEP LOG to CCmlO, 20 Sep 54, on DF, DCCmlO to ACofS G - 4, 25 Aug 54, sub: Utilization of Non-Standard Protective Masks.

masks into M1 for issue to troops.[121] (UNCLASSIFIED)

Under the new policies, limited and substitute standard masks would be taken out of static storage and utilized for training during both peacetime and mobilization periods. The standard M9A1 mask would be used only overseas and in certain high priority units in CONUS. By this means the normal consumption and replacement would deplete stocks of limited and substitute standard masks. At the same time the Chemical Corps hoped that the continuing depreciation of stocks of M9A1 masks would lead to the allotment of additional funds and authority for further procurement of standard masks.

Troops

At the end of FY 1955 the Chemical Corps had a total of 60 T/O&E units (actually one was an experimental T/D field unit) with a total of 5,317 officers and men. Of this total, twenty-one units were assigned to the Chief Chemical Officer and located principally at Chemical Corps Training Command, Fort McClellan, Ala. Fourteen units were assigned to continental armies, nearly all being at Fort Bragg, N.C. Overseas, 21 chemical units were in Europe and 2 in the Far East, while 2 small detachments were serving in the Carribean.[122] A continued reduction in unit strength and a shifting of forces from the Far East to the United States and Europe characterized

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(1) Ltr, CCmlO to Pres CmlC Bd, 1 Sep 54, sub: Field Test of M2 Series Gas Mask. (2) Ltr, Pres CmlC Bd to CCmlO, 24 Feb 55, sub: Letter Report on Project 2-55, M2 Series and E6 Assault Masks; 1st Ind, 5 May 55. (3) Interv, Hist Off with Mr Samuel P DiMattia, CmlC Bd, 13 Sep 55.

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Figures on troop strength and number of units furnished by Plans Br, OCCmlO.

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Table 5 -- Location of Chemical Corps Units (1 July 1955)

Units Stationed in Zone of Interior

ARMY CHEMICAL CENTER
- 42d Cml Lab
- 51st Cml Det (TI)
- 52d Cml Det (TI)

ROCKY MOUNTAIN ARSENAL
- 210th Cml Co (Svc)

CAMP DETRICK
- 17th Cml Det (TI)

FORT ORD
- 50th Cml Plt (Svc)

FORT MEADE
- 33th Cml Co (Maint)

FORT MCCLELLAN
- 100th Cml Gp (ComZ) HHD
- 218th Cml Bn (Smk Gen) HHD
- 51st Cml Co (Smk Gen)
- 62d Cml Co (Smk Gen)
- 74th Cml Co (Smk Gen)
- 83d Cml Bn HHD
- 85th Cml Bn HHD
- 21st Cml Co (Decon)
- 30th Cml Co (Decon)
- 34th Cml Co (Maint)
- 59th Cml Co (Maint)
- 66th Cml Co (Depot)(ComZ)*
- 501st Cml Co (Depot)(ComZ)*
- 111th Cml Co (Processing)
- 18th Cml Det (TI)
- 317th Cml Co (Processing)

*Units on duty in the Arctic

FORT BENNING
- 87th Cml Co (Smk Gen)

FORT BRAGG
- 81st Cml Gp (Fld Army) HHD
- 5th Cml Bn (Smk Gen) HHD
- 84th Cml Co (Smk Gen)
- 85th Cml Co (Smk Gen)
- 86th Cml Co (Smk Gen)
- 3d Cml Bn HHD
- 24th Cml Co (Decon)
- 9th Cml Co (Depot)(Fld)
- 61st Cml Co (Depot)(Fld)
- 11th Cml Co (Maint)
- 505th Cml Co (Maint) **

DUGWAY PROVING GROUND
- 2d Cml Bn (Wpns)

Units Stationed Overseas

FAR EAST COMMAND
- 43d Cml Det (Lab)(Mbl)
- 503d Cml Det (TI)

EUROPEAN COMMAND
- 4th Cml Bn (Smk Gen)
- 6th Cml Co (Smk Gen)
- 44th Cml Co (Smk Gen)
- 45th Cml Co (Smk Gen)
- 46th Cml Co (Smk Gen)
- 46th Cml Co (Smk Gen)
- 68th Cml Co (Smk Gen)
- 69th Cml Co (Smk Gen)
- 81st Cml Co (Smk Gen)
- 82d Cml Co (Smk Gen)
- 83d Cml Co (Smk Gen)
- 98th Cml Co (Smk Gen)
- 172d Cml Co (Smk Gen)
- 1st Cml Bn (Svc)

CARRIBEAN
- 242d Cml Det (Svc)
- 502d Cml Det (Svc)

- 12th Cml Co (Maint)
- 7th Cml Co (Depot)(Fld)
- 55th Cml Co (Processing)
- 53d Cml Lab
- 19th Cml Det (TI)
- 48th Cml Det (TI)
- 275th Cml Det (TI)

** Third Army Operations Unit, not General Reserve.

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FY 1955. The largest cut in Chemical Corps units took place in the Far East when several units were inactivated and others transferred to the United States.[123] (SECRET)

During the year the Assistant Chief of Staff, G - 3, initiated action to return all Reserve units on active duty to Reserve status and to replace them with Regular Army units. All such units were returned less personnel and equipment. One of the pressing reasons for returning Reserve units to their Reserve status was the DA practice of counting Reserve units twice against authorized unit strength of the Army. A Reserve unit on active duty counted once as part of the Regular Army; it counted a second time as a Reserve unit, as no unit was authorized to replace it in the Reserve. By retiring a Reserve unit and replacing it on active service with a Regular Army unit, the Army could increase its actual total number of units, both Regular and Reserve. As the Reserve unit returned to inactive status less personnel, it would, however, be some time before the Reserve unit would become more than a number on the Army rolls. (UNCLASSIFIED)

The first Chemical Corps unit returned to the Reserve was the 390th Chemical Laboratory which was placed on Reserve status at Texas City, Texas, and replaced by the 42d Chemical Laboratory (Regular Army).[124] Some other units returned to Reserve status included the 358th Chemical Company

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123 For location and number of units as of 1 July 1955, see Table 5.

124 (1) TAG Ltr (AGAO-I (M) 322 RA (14 Sep 54) GI), 29 Sep 54, subj: Activation of Certain Units. (2) Ltr, OCmlO to CG ACmlC, 22 Oct 54.