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Item 1882

APPROVED

MAY 14 1948

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DECLASSIFICATION SCHEDULE
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF, CHEMICAL CORPS
Chemical Corps Technical Committee
Army Chemical Center, Maryland

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TSE/5190/blac
13 April 1948
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SUBJECT: Chemical Corps Project Program for 1949

TO: The Chairman, Chemical Corps Technical Committee

1. References:

- a. CCTC Item 1760, 22 July 1947
- b. CCTC Item 1818, 21 Oct 1947

2. Discussion:

a. Reference a. identifies the read for record action which approved the Medical Division and Technical Command sections of the 1948 project program while reference b. indicates similar action for the Biological Division program at Camp Detrick. Subsequent to these approval actions, changes were incorporated as required from time to time in order to revise the complete program in accordance with changing needs and requirements as reflected by action coordinated through this Committee. As the result of this constant revision the 1948 project program, as presently constituted, consists of the 229 projects listed in the summary attached herewith as Inclosure 1 which includes all projects now on the books with the exception of those not listed for reasons of security. It should be noted that projects are continually being terminated and new ones established through Committee action as provided by existing regulations and procedures.

b. In order to provide a timely and periodic review of all Chemical Corps research and development activity as stipulated by WD Circular 126, dated 17 May 1947, the R&E Div, OC-Cml C has prepared the attached Inclosure 2 in three sections which describes the proposed program for 1949 consisting of the projects assigned the three developing agencies, namely, the Biological Division, the Medical Division and the Technical Command. This proposed 1949 program consists essentially of a continuation of work now in progress with the rearrangement of certain existing projects in order to indicate more clearly the desired objectives. In addition, completed projects have been removed from the new program together with those that are superseded, deferred, cancelled or otherwise terminated so that major emphasis and effort may be placed upon the work deemed most essential in view of the over-all situation now existing. The proposed disposition of all projects in the currently approved 1948 program is

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RESEARCH AND DEVELOPMENT PROJECT CARD (NEW PROJECTS)		2. SEC. Secret	3. PROJ. NO. 4-04-15-05
1. PROJECT TITLE Munitions for G-Series Filling		4. 5. REPORT DATE 18 Mar 48	
6. BASIC FIELD OR SUBJECT Ammunition		7. SUB FIELD OR SUBJECT SUB GROUP Chemical Munitions	
8. COGNIZANT AGENCY Chemical Corps	12. CONTRACTOR AND/OR LABORATORY Munitions Div./Aerial Weapons Br.		CONTRACT/W. O. NO.
9. DIRECTING AGENCY Technical Command	13. RELATED PROJECTS 4-04-15-01 4-08-05-02 4-04-15-07 4-08-03-05		17. EST. COMPL. DATES RES. DEV. June 1950 TEST June 1951 OP. EVAL 1952
10. REQUESTING AGENCY Chemical Corps	14. DATE APPROVED 22 July 1947, CCTC item 1760		18. FISCAL EST'S. FY 48 \$10M 49 \$25M 50 \$40M
11. PARTICIPATION AND/OR COORDINATION None	15. PRIORITY 2-A	16.	
19.			

20. AUTHORITY AND/OR JUSTIFICATION
(b)(2) HIGH

21. BRIEF OF PROJECT AND OBJECTIVE

Exploratory phases of the study of GA, one of the agents of the G series, will be made with standard munitions, followed in turn with modified standard, and finally with the development of new munitions and methods of dispersion.

Static tests of GA utilizing M70 bombs, 4.2-in. chemical mortar shell, and GA-charged German munitions will be conducted. The object of these tests is to determine the vapor and liquid concentration and the extent of decomposition of the agent by detonation. Independent studies have been carried out at Porton, England, on the results of the German equivalent of GA in various munitions and also at Raubkammer, Germany, by German methods and personnel under the supervision and observation of the British. The development of new and improved methods of dispersal with special emphasis on air burst, thermal generators, and guided missiles, at such time as suitable warheads are available, will be continued. Field tests to determine drop size and distribution, vapor concentrations, and toxicity effects of the liquid and vapor under a wide range of atmospheric conditions will be determined. Stability and corrosion effects of GA in filled munitions on protective coatings for munitions and on suitable closure devices will be investigated, and efforts will be made to keep abreast of new developments in field-filling and servicing equipment.

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Funds: 40 M
Priority: 2-A

4-04-15-05 MUNITIONS FOR G-SERIES FILLINGS

a. Results Prior to 1948: None.

b. 1948 Results:
(b)(3): TO USC 130

c. 1949 Plan:

- (1) Complete engineering tests leading to an interim bomb for G agents.
- (2) Fabricate bombs for service test.
- (3) Conduct service test.
- (4) Initiate design of a clusterable bomb more efficient than the interim bomb.

d. Changes in Data for JRDB Form 1A: None.

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 1. PROJECT TITLE
 Munition
 2. BASIC FIELD
 Ammunition
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RESEARCH AND DEVELOPMENT PROJECT CARD (NEW PROJECTS)		2. SEC. Secret	3. PROJ. NO. 1508-03-05 (A 1.13)
1. PROJECT TITLE Agents of the G Series		5. REPORT DATE 26 Mar 48	
6. BASIC FIELD OR SUBJECT Chemical Warfare		7. SUB FIELD OR SUBJECT SUB GROUP Agents	
8. COGNIZANT AGENCY Chemical Corps	12. CONTRACTOR AND/OR LABORATORY University of Michigan University of Notre Dame University of Pennsylvania Southern Research Institute Chemical & Test Divisions		CONTRACT/W. O. NO. W-18-035-CWS-1339 W-18-035-CWS-1312 W-18-035-CWS-1311 W-18-035-CWS-1382
9. DIRECTING AGENCY Technical Command	10. REQUESTING AGENCY Chemical Corps		13. RELATED PROJECTS 4-04-15-05 4-92-03-02
11. PARTICIPATION AND/OR COORDINATION None		14. DATE APPROVED 5 July 45 - CWTC Item 1445	17. EST. COMPL. DATES RES. Continuing DEV. TEST OP. EVAL.
15. PRIORITY 1-C		16.	18. FISCAL EST.'S. 48 \$ 60 M 49 \$180 M 50 \$180 M
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20. REQUIREMENT AND/OR JUSTIFICATION (b)(2) HIGH			
21. BRIEF OF PROJECT AND OBJECTIVE <p>The search for the most effective agents in this series will be conducted as follows: Analogs and compounds similar in structure will be synthesized for toxicity evaluation by the Medical Division. On those agents warranting further study, research will be continued and laboratory process development studies made in order to develop methods of synthesis which are practical and suitable for pilot-plant use.</p> <p>Methods for the detection and estimation of these agents will be investigated with development of procedures suitable for both laboratory and field use.</p> <p>Their physical constants, corrosive effect on metals, and stability in storage and in the presence of moisture will be investigated as aids in selecting the best agent for standardization.</p>			
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Funds: 180 M
Priority: 1-C

4-08-03-05

AGENTS OF THE G SERIES

a. Results Prior to 1948: The German opinion on the over-all greater effectiveness of GB over GA was confirmed on the basis of stability, toxicity, and volatility. No analog of GB was discovered which was sufficiently more toxic to warrant procurement of an alcohol much less available than isopropyl. Reactions for the detection and estimation of G-type compounds were discovered, and development of field and laboratory procedures was begun. A simplified four-step synthesis for GB was developed for pilot-plant trial.

b. 1948 Results: During first half of the fiscal year, major effort was devoted to investigations for improvement of the GB process. Midway in the fiscal year, a program was established for preparation of about 40 GB analogs, designed to provide data for correlation of structure with toxicity, stability, and physical properties. Work is in progress on this plan. In addition, about six analogs of GB were prepared and submitted to Medical Division for screening tests (Physical constants, TDMR 1292; hydrolysis, TCIR 393; chemistry, TDMR 1314). A number of compounds also were prepared similar to G agents in which silicon replaced phosphorus. Toxicity was of G-agent type, but of a lower order.

Development of a simplified method for GB manufacture was not successful; therefore effort was directed toward improving the present five-step process. Continuous-flow procedures appeared practicable for steps 2 and 3, and step 4 was improved. Preliminary stability results indicated that GD is less stable in storage than GB and about as stable as GA (TDMR 1326 and 1346).

A fluorescent and a colorimetric method of detection of G-type compounds were developed, with adaptation of latter to field estimation. (TDMR 1307 and 1317; TCIR 366) A continuous analyzer (fluorescent principle), which is suitable for estimation in manufacturing plants, was constructed.

c. 1949 Plan:

(1) Continue search for more effective agents of the G series. About 40 new compounds of this class have been selected for synthesis in sufficient amount for toxicity and stability evaluation.

(2) Research will be conducted for a more direct, more stable, and more rapid G agent detector. This is purely a research function and does not include development work on the chemical agent detector kit, which is the end item.

(3) Improved methods of analysis will be developed to correlate, as closely as possible, analytical and biological assay. The peroxide reaction and infrared absorption spectra appear to be most promising.

(4) Work will be continued in the process laboratory and in cooperation with the pilot plant in development of a five-step continuous process for GB manufacture.

(5) Stability of all promising members of the G series compounds will be determined, and correlation of stability with structure will be attempted.

d. Changes in Data for Form 1A: Priority from 2-A to 1-C (CCTC item 1837).

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RESEARCH AND DEVELOPMENT PROJECT CARD (NEW PROJECTS) 2. SEC. Secret 4-9205-02(A 1.13-2.1)

1. PROJECT TITLE GB Plant, Process Development		4.		5. REPORT DATE 25 Mar 48	
6. BASIC FIELD OR SUBJECT Processing Methods, Manufacturing Techniques, & Equipment		7. SUB FIELD OR SUBJECT SUB GROUP Chemicals			
8. COGNIZANT AGENCY Chemical Corps		12. CONTRACTOR AND/OR LABORATORY Plants Div./Design Branch		CONTRACT/W. O. NO.	
9. DIRECTING AGENCY Technical Command					
10. REQUESTING AGENCY Chemical Corps		13. RELATED PROJECTS 4-04-15-05 4-08-03-05		17. EST. COMPL. DATES	
11. PARTICIPATION AND/OR COORDINATION None		14. DATE APPROVED 16 Apr. 46 - CWTC item 1611		RES.	
		15. PRIORITY 1-C		16.	
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20. REQUIREMENT AND/OR JUSTIFICATION
(b)(2) HIGH

21. BRIEF OF PROJECT AND OBJECTIVE

The object of this project is to develop a manufacturing technique together with the necessary equipment and operating directives for designing a plant capable of producing GB in the quantities necessary for use in military operations.

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JRDB FORM 1A, 1 APR 1947

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Funds: 50 M
Priority: 1-C

4-92-03-02 GB PLANT, PROCESS DEVELOPMENT

a. Results Prior to 1948: An improved process for producing GB was developed in the laboratory, and a pilot plant was built step-wise.

b. 1948 Results: Approximately 400 lb. of GB was produced in the pilot plant, and data for the design of a production plant were collected. Several minor difficulties with the manufacturing process were encountered, and changes in the design of the plant were made to correct these difficulties and to improve the yield of GB. Additional equipment was ordered for the plant.

c. 1949 Plan:

(1) Make necessary changes in the pilot plant, and again operate it to assess the revised process and to produce additional GB required for field tests.

(2) Complete the collection of data required for the design of a production plant.

(3) Prepare a report of the pilot-plant process.

d. Changes in Data for JRDB Form 1A: Priority from 2-A to 1-C (CCTC item 1837).

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