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Copy No. 100

Minutes of the Meeting of the
Chemical Corps Technical Committee
19 April 1955

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Meeting No. 1, 1955

~~SECRET SUPPLEMENT~~

Items

2965, 2966, 2968, 2969, 2972, 2977, 2984,
2987, 2990, 2996, 2997, 2999, 3003, 3020,
& 3021

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Item 2969

READ FOR RECORD
Copy No. _____
(5 Pages)

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF CHEMICAL OFFICER
Chemical Corps Technical Committee
Army Chemical Center, Maryland

CMLWH

6 December 1954

MEMORANDUM FOR RECORD

SUBJECT: ARDC Project No. 1081, BW-CW Vulnerability Assessment

The attached data sheet for the subject Air Force project is reproduced as information pertinent to certain phases of the Chemical Corps R&D BW and CW programs.

FOR THE CHAIRMAN, CHEMICAL CORPS TECHNICAL COMMITTEE:

T. S. Eckert

Incl
As noted

T. S. ECKERT
Secy, CCTC

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Rewritten Project

Item 2969

1. PROJECT TITLE: BW-CW Vulnerability Assessment (U)
2. SECURITY CLASSIFICATION: Secret
3. PROJECT NUMBER: 1081
5. REPORT DATE: 7 July 1954
6. BASIC FIELD OR SUBJECT: Supporting Research
7. SUB FIELD OR SUBJECT: Toxicological Weapons Defense (62)
- 7a. TECHNICAL OBJECTIVE: CW-4; BW-4
8. COGNIZANT AGENCY: Headquarters ARDC
9. DIRECTING AGENCY: Special Weapons Branch, WADC
10. REQUESTING AGENCY: Headquarters ARDC
11. PARTICIPATION AND/OR COORDINATION: AFAC (P) Hq AMC (C); Chemical Corps D/A (P); USA(AR); Naval Research Lab. (I)
12. CONTRACTOR AND/OR LABORATORY: See 21d
13. RELATED PROJECTS: 6017, 6018, 7310, 7311, 6310, 7159, 6350
14. DATE APPROVED: 12 May 1953
15. PRIORITY: 1-A
17. ESTIMATED COMPLETION DATES: Res - Continuing
18. FISCAL ESTIMATES: Previous \$235M; FY 55 - 200M; FY 56 - 200M; A/R 200
19. SUPERSEDED PROJECTS: This project was formerly carried as a task under RDO R611-20 and RDO R611-21
20. REQUIREMENT AND JUSTIFICATION: Hq ARDC letter, Subj: Development of "BW-AW-BW-CW Protective Materiel", dated 16 June 1952, directed WADC to approach the development of protective BW-CW materiel through an assessment of hazards to Air Force personnel and equipment from the effects of biological and chemical warfare agents. These agents could be dispersed by enemy action or as a result of accident during USAF offensive operations. Headquarters ARDC, letter, Subject: "Implementation of 80-4 for B/CW Vulnerability Studies" (U), dated 23 April 1954, advised WADC to combine the multiple phases of the Vulnerability Study into a single project. (Secret)
21. Brief of Project and Objective. -
 - a. Brief. - The Vulnerability Assessment is a study to determine the hazards to Air Force personnel and equipment from the effects of toxic or pathogenic agents. These BW and/or CW agents could be dispersed by enemy action or as a result of accident during USAF storage, transport or offensive operations. The results of the assessment will be used to provide guidance to the USAF BW-CW Defensive Program and to provide information to assure successful USAF operations involving the use of BW-CW munitions. The tests are expected to indicate measures for detection, decontamination and individual and collective protection which may be utilized, if required, to minimize the hazards which would be imposed by enemy attack or operational accident on an airbase. (Secret)
 - b. Approach. - The general test procedure will be to subject various items of Air Force equipment and airbase areas to contamination by toxic CW and simulant BW agents. Current operational aircraft types will be utilized in the tests whenever possible. (Secret)

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The test areas will be divided broadly into six parts:

Part A - Determination of Hazards: Within and on the exterior of normally secured aircraft subjected to overt enemy action or as a result of accident involving USAF BW-CW operations. This will include a determination of hazards from leaking munitions. (Secret)

Part B - Determination of the hazards involved for Aircrews operating from contaminated runways following overt BW-CW attack. (Secret)

Part C - Determination of the hazards involved for ground crews operating on an airbase subjected to overt BW-CW attack. (Secret)

Part D - Assessment of the protection afforded by typical Air Force building structures during overt BW-CW attack. (Secret)

Part E - Assessment of hazards imposed on an airbase and surrounding areas following the crash, burning or other accident involving an aircraft carrying USAF BW-CW munitions. This would include a determination of hazards involved in low altitude jettison of USAF BW-CW munitions (simulate jettison immediately after take-off). (Secret)

Part F - Assessment of the vulnerability of an operational airbase from overt BW-CW attack and from covert BW attack. (Secret)

c. Subtasks. -

(1) Task No. 10812, Aeromedical Assessment - This task will consist of engineering tests, including evaluation, of the BW-CW Vulnerability Assessment as it pertains to Air Force requirements for protective clothing and respiratory protection. A determination of the existence of any unusual effects of toxic or pathogenic agents on aircrew members, engaged in flight, will be made. (Secret)

(2) Task No. 10813, Armament Assessment - This task will consist of engineering tests, including evaluation, of the BW-CW Vulnerability Assessment as it pertains to Air Force requirements for safe handling information involving USAF BW-CW munitions. This will include such areas as hazards from leaking munitions, demilitarization or disposal procedures and the evolution of recommended safe handling procedures for operationally acceptable munitions. Weapons effects data obtained during development testing of munitions will be utilized in determining the need for defensive items. For this reason, coordination by the task engineer on the preparation of munitions development test plans is required. (Secret)

(3) Task No. 10814, Equipment Assessment - This task will consist of engineering tests, including evaluation, of the BW-CW Vulnerability Assessment as it pertains to Air Force requirements for BW-CW detection devices for aircraft and ground installations, collective protection devices, and training equipment for BW-CW defensive materials. (Secret)

(4) Task No. 10815, Materials Assessment - This task will consist of engineering tests, including evaluation, of the BW-CW Vulnerability Assessment as it pertains to Air Force requirements for BW-CW decontamination materials including equipment and techniques. This will

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include such areas as agent persistency in typical AF buildings and the effects of various decontamination techniques on materiel.

(Secret)

d. Other Information. -

(1) Close coordination will be maintained with the testing agencies under the jurisdiction of the Army Chemical Corps. Coordination will be effected with other AF centers or commands interested in or participating in the Vulnerability Assessment. Test results and subsequent evaluation will be distributed to interested organizations as soon as the documents are available.

(Unclassified)

(2) It is intended that tests will be conducted by or through the following organizations:

Chemical Corps, Research and Engineering Command
Camp Detrick, Frederick, Maryland
Air Force Armament Center

These organizations will furnish test facilities, sampling and analytical equipment and/or test personnel as required. (Unclassified)

e. Background History. -

(1) General - Headquarters ARDC, Letter, Subj: "Development of RW-AW-BW-CW Protective Materiel", dated 16 June 1952, recommended that the approach to the development of Protective Materiel be through a study of vulnerability and evaluation of hazards in connection with RW-AW-BW-CW agents and operational conditions expected. Headquarters ARDC, letter, Subj: "Implementation of 80-4 for B/CW Vulnerability Studies" (U), dated 23 April 1954, advised WADC to combine the multiple phases of the Vulnerability Study into a single project. (Secret)

(2) CW Vulnerability - A meeting was held at WADC on 22 Aug 1952 to delineate the areas involved in a Vulnerability Study. This meeting was attended by representatives of interested WADC laboratories and a representative from Dugway Proving Ground. It was agreed that data on CW Defensive problems should for the most part be obtained from the munitions development testing at Dugway Proving Ground. In practice, it has been found that only limited data has been obtained as a by-product of munitions tests. A subsequent meeting was held on 20 Nov. 1952 to discuss a test plan for a CW Vulnerability Study which was generated by the 22 August 1952 meeting. This CW Vulnerability Study was approved by WADC on 22 December 1952 and carried as a task under the WADC CW Decontamination Project. Tests in support of this have been conducted at Dugway Proving Ground, Utah. Some information outlined in b. above has been obtained in these tests and will partially reduce the required test effort in some of the phases listed. Some of these tests have been inconclusive and will require repetition. (Secret)

(3) BW Vulnerability - An Air Force - Army Chemical Corps meeting was held on 19 February 1953 to delineate a BW Vulnerability Study. This program has been carried as a task under the WADC BW Decontamination Projects. Primary responsibility to conduct the test work was

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assigned, within the CmlC to Camp Detrick, Md. Tests in support of this program have been conducted at Eglin AFB, Florida. Results of these tests obtained in the warm weather climate will be utilized to evaluate hazards under these weather conditions and will be used to predict future test requirements - particularly Part F. (Secret)

(4) Since the scope of the Vulnerability Program covered independent interests of four (4) laboratories and two (2) directorates the program has been reassigned within WADC, to the Special Weapons Branch, Development Operations Division. In compliance with recommendations by Human Factors Division, Hq ARDC; AFOAT and Division of Human Factors, Hq USAF, at a meeting at WADC on 25 and 26 February 1954, the Vulnerability Assessment is being established as a separate project. (Confidential)

(5) In addition to the action taken in (4) above, an Advisory Committee consisting of at least one member from each of the interested WADC laboratories is being established. Air Materiel Command is participating on this Committee to insure coverage of their interests in the BW-CW Defensive and logistics areas. This Committee will work with Project BIG BEN and with Army and Navy agencies concerned with the Vulnerability Assessment to evaluate test results and to determine new work areas. (Confidential)

f. References. -

- (1) Hq ARDC letter, Subj: "RW-AW-BW-CW Protective Materiel", dated 16 June 1952. (Unclassified)
- (2) Dugway Proving Ground Report #133, Air Force Vulnerability Assessment. (Unclassified)
- (3) Preliminary report to Dugway Proving Ground Report #147 Air Force Vulnerability Assessment Part II. (Unclassified)
- (4) Chemical and Radiological Laboratories Report #212, Decontamination of Airplanes. (Unclassified)
- (5) Chemical and Radiological Laboratories Report #213, Interim Report, (Literature Survey) "Vulnerability of an AF base to Chemical Warfare Agents and subsequent Decontamination Operations Required After Attack". (Secret)
- (6) Biological Laboratories Interim Report #51, "Vulnerability Study Relating to BW Contamination of jet fighter aircraft cockpits" (Confidential)

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Item 2972

DEPARTMENT OF THE NAVY
Bureau of Ordnance
Washington 25, D. C.

In reply refer to:
AIO-8
Rex-1-IET-gmw
Ser 002688
6 August 1954

REGISTERED MAIL SECRET

From: Chief, Bureau of Ordnance
To: Distribution List

Subj: Navy Research and Development Technical Reports; forwarding of

Ref: (a) Restr OPNAV INSTRUCTION 3950.1 of 4 June 1951 to Distribution List

1. In accordance with reference (a), Planning Objective Summary, Operational Requirement Summaries, and Project Descriptions are submitted as indicated below. Status of projects is indicated by the following:

A - Active	SS - Suspended
S - Superseded	CC - Cancelled
C - Completed	

Planning Objective: Chemical Warfare Operations

<u>Project Description & Proj. Prog. Rpt. Nos.</u>	<u>Short Title</u>	<u>Pri- ority</u>	<u>Status</u>	<u>Report Date</u>
<u>Operational Requirement Summary - CW-03401</u>				
NO 253333 A-3c-326	Clusters, Predetermined Pattern	3	CC	7/15/54
NO 253334 A-3c-327	Clusters, (Low Drag) Aimable Incendiary	3	A	7/15/54
NO 253335 A-3c-329	Bombs, Incendiary	3	CC	7/15/54
NO 253364 A-3c-350	C. W. Bombs	3	A	7/15/54
NO 392116 E-2a-618	Chemical Warfare Agent Dissemination	3	A	7/15/54
NO 393201 B-3b-243	CW and Auxiliary Projectiles	3	A	7/15/54
NO 393501 E-3e-563	Chemical Warfare Rockets	3	A	7/15/54

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2. The over-all security classification of this compilation is SECRET. Any individual part shall be classified according to the classification indicated thereon.

3. This material contains information affecting the National Defense of the United States within the meaning of the Espionage Laws, Title 18, U.S.C., Sects. 793 and 794; the transmission or the revelation of which in any manner to an unauthorized person is prohibited by law.

4. Transmission by United States registered mail or registered guard mail is authorized in accordance with article 7-5, United States Navy Security Manual for Classified Matter.

M. F. SCHOEFFEL

/s/ Chas. E. Briner

Chas. E. Briner
By direction

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1 July 1954

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BUREAU OF ORDNANCE
(Rexb)

PLANNING OBJECTIVE SUMMARY - CHEMICAL WARFARE OPERATIONS (CW)

Planning Objective: To develop equipment, agents and techniques for the employment of toxic chemicals, incendiaries, and smokes to produce death or casualties in man; for the destruction of material or screening operation to enemy weapons or intelligence; or for defense against such action by an enemy.

1. The Chemical Corps, U.S. Army, has primary responsibility in the field of Chemical Warfare Operations (CW). The Bureau of Ordnance responsibility comprises evaluation and selection of toxic and non-toxic agents; development of material and techniques for dissemination for offensive action by Naval forces; and development of procedures, with associated material, for safe adequate storage and handling of chemical warfare materiel.
2. The major emphasis of the Bureau of Ordnance is concentrated in Operational Requirement CW-03401, supporting the Chemical Corps in the design and development of projectiles, bombs, and rockets as suitable CW munitions. A large portion of monetary support is directed to development of bombs for CW application; the Bureau of Ordnance is evaluating service Chemical Corps items for possible naval use, and supports the development by the Chemical Corps of improved incendiary bombs, particularly a low drag type aimable incendiary suitable for external suspension on high speed aircraft. At Bureau of Ordnance direction, the Chemical Corps is currently engaged in studies and development projects to produce projectiles and rocket war-head for CW loading; the ballistic testing for these items is accomplished at Navy test facilities.
3. The Bureau of Ordnance possesses the technical competence in ordnance design and maintains adequate test facilities to ensure satisfactory, efficient munitions for present service demands, and by utilization of research effort and technical knowledge afforded by the U. S. Army Chemical Corps, new and thoroughly effective munitions with associated handling material and techniques will be provided for special requirements as the needs are defined.
4. The allocation of responsibility to a single department for a specific area of research and development is well demonstrated in the field of CW. The U.S. Army Chemical Corps has cognizance of research effort for all of the using agencies. The Bureau of Ordnance budgets and allocates funds to the Chemical Corps for basic and applied research, development studies, and major portions of applications. Close liaison and information exchange necessary is maintained for efficient operation of the CW program.
5. The statement of the Planning Objective is considered adequate. Existing material and technical knowledge will partially meet current requirements; the BuOrd directed investigations and developments performed by the Chemical Corps are expected to provide complete solution for immediate needs and all foreseen offensive applications.

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1 July 1954

BUREAU OF ORDNANCE
(Rexa, Rexb, Re2, Re3)

OPERATIONAL REQUIREMENT SUMMARY - CW-03401

Title of Operational Requirement: Develop material and techniques for the dissemination of chemical warfare agents including ammunition and warheads to make them suitable for this purpose and the production, storage and handling of such bombs, ammunition and warheads.

1. Application of existing basic and applied research and technical knowledge, augmented by results of current chemical Corps research and development projects, gives promise of essential support of requirements of both interim service demands and the presently foreseeable naval applications in CW disseminating munitions and associated handling techniques.
2. Brief Summary of Over-all Progress: The Chemical Corps, U.S. Army, has completed a preliminary design of 5" and 6" projectiles, 5" 0 Spin Stabilized Rocket and 500 lb. Low Drag Bomb for adaptation of CW agent munitions. Flight ballistic data and static dissemination characteristics of the projectiles and rockets have been completed and found satisfactory. Extensive investigation and test of chemical bomb type munitions indicates that the "Massive" type of chemical bomb may be superior in over-all features and effectiveness to cluster type munitions.
3. Brief Description of Contribution of Each Project:

a. NO 253333 (A-3e-326), Clusters, Predetermined Pattern - Project is cancelled. Future work will be incorporated in Project NO 253353 (A-3c-339), Bomb, Cluster Type, Anti-Tank, Anti-Personnel.

b. NO 253334 (A-3c-327), Clusters (Low Drag), Aimable Incendiary - Catapult, arrested landing, fit, flight, and drop tests were conducted on various Army chemical munitions to determine what modifications, if any, would be required to make them acceptable. These test results are at present being correlated to determine the next logical step in progress of this program.

c. NO 253335 (A-3c-329), Bombs, Incendiary - Project is cancelled. Future work will be incorporated in Project NO 253334 (A-3c-327), Clusters (Low Drag), Aimable Incendiary.

d. NO 253364 (A-3c-350), C. W. Bombs - The Army Chemical Center has modified thirty (30) 500 lb. low drag G.P. bombs for chemical agent usage. These bombs modified with burster tube and simulant loaded are being shipped to test activities.

e. NO 392116 (B-2a-618), Chemical Warfare Agent Dissemination - The Chemical Corps, U. S. Army, has completed a preliminary design of 5" and 6" projectiles, 5" 0 Spin Stabilized Rocket and 500 lb. Low Drag Bomb for adaptation of CW agent munitions. Flight ballistic data and static dissemination characteristics of the projectiles and rockets have been

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OPERATION REQUIREMENT SUMMARY - CW-03401

BUREAU OF ORDNANCE

completed and found satisfactory. Additional test firings are necessary to determine strength characteristics of the metal components and chemical agent, dissemination on ground impact function when gun is fired. The gun firings will be conducted at Dugway Proving Ground. Preliminary design of the 5"/54 and 6"/47 White Phosphorous Projectiles and 5"0 Spin Stabilized Rocket has been completed and are scheduled to be tested early in F.Y. 1955 at the Naval Proving Ground.

f. NO 393201 (B-3b-243), CW and Auxiliary Projectiles - Preliminary steps have been initiated in conjunction with the Army Chemical Center for testing 5" and 6" H.C. and Illuminating Projectile bodies with GB and WP loadings, respectively. Development and designs of solid base projectiles for GB load have been undertaken. A limited quantity of 5"/38 projectiles, designed for the liquid load, is being procured for test and evaluation.

g. NO 393501 (B-3e-563), Chemical Warfare Rocket - This project will result in the development of a spin stabilized barrage rocket with a warhead capable of disseminating chemical warfare agents. Existing 5"0 rocket motors and heads are being investigated to determine what design changes will be required to make them suitable for this purpose. The Army Chemical Center is currently conducting this investigation. If required, the Naval Ordnance Test Station will undertake redesign of the rocket motor, or design of the rocket motor, or design and develop a new one to accommodate whatever head design the Chemical Center determines to be suitable.

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Termination Report

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1-A Form Data Sheet:

1. PROJECT TITLE: Clusters, Predetermined Pattern
2. SECURITY CLASSIFICATION: SECRET
3. PROJECT NUMBER: NO 253333
5. REPORT DATE: 15 July 1954
6. BASIC FIELD OR SUBJECT: Chemical Warfare
7. SUB FIELD OR SUBJECT: Bombs, General; Bomb Clusters; CW-03401
8. COGNIZANT AGENCY: BuOrd
9. DIRECTING AGENCY: BuOrd (Re3c, F. Sirc)
10. REQUESTING AGENCY: BuOrd
11. PARTICIPATION AND/OR COORDINATION: Dept. of the Army (Chemical Corps)(C)
12. CONTRACTOR AND/OR LABORATORY: Dept. of the Army (Chemical Corps)
13. RELATED PROJECTS: NO 253331 (A-3c-321); NO 253334 (A-3c-327);
NO 253353 (A-3c-339)
14. DATE APPROVED: 24 January 1949
15. PRIORITY: 3
17. ESTIMATED COMPLETION DATES: Cancelled
18. FISCAL ESTIMATES: FY 54 - 0; FY 55 - 0; Total - (See 21-f)
19. SUPERSHEDED REPORTS: Cancels and supersedes NO 253333 (A-3c-326)
dtd 7/15/53
20. REQUIREMENT AND/OR JUSTIFICATION: Predetermined patterns are required to gain maximum coverage from a limited number of small bombs.
21. BRIEF OF PROJECT AND OBJECTIVE:
 - a. Brief: Develop a cluster that will give a predictable impact pattern of the unit bombs for the efficient dispersion of chemical agents.
 - b. Approach: Design, develop, and test a cluster that through its construction and working parts will disperse the unit bombs in such a manner that a predetermined impact pattern will result.
 - c. Sub-Tasks: Department of the Army (Chemical Corps) is incorporating features in clusters under development to make them suitable for Navy use as practicable.
The Bureau of Ordnance is testing Chemical Corps development items to determine suitability for Navy use.
 - d. Other Information: None
 - e. Background and/or Progress: Existing clusters of Chemical Bombs are designed primarily for internal carriage and impose restrictions when carried externally. Together with Bureau of Ordnance, Chemical Corps is developing modifications to minimize restrictions. Work on NO 253353 directly applicable.
 - f. Future Plans: Project is cancelled. Future work will be coordinated with Project No. 253353 (A-3c-339). Bomb, Cluster Type, Anti-Tank, Anti-Personnel.
 - g. References: None

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1-A Form Data Sheet

1. PROJECT TITLE: Clusters, (Low Drag) Aimable Incendiary
2. SECURITY CLASSIFICATION: Confidential
3. PROJECT NUMBER: NO 253334
5. REPORT DATE: 15 July 1954
6. BASIC FIELD OR SUBJECT: Chemical Warfare
7. SUB FIELD OR SUBJECT: Bombs, General; Low Drag Clusters; CW-03401
8. COGNIZANT AGENCY: BuOrd
9. DIRECTING AGENCY: BuOrd (Re3C, F. Sirc)
10. REQUESTING AGENCY: BuOrd
12. CONTRACTOR AND/OR LABORATORY: Dept. of the Army (Chemical Corps)
13. RELATED PROJECTS: CML C Project #4-04-16-08
14. DATE APPROVED: 24 January 1949
15. PRIORITY: 3
17. ESTIMATED COMPLETION DATES: (See 21-f)
18. FISCAL ESTIMATES: FY 54 - 0; FY 55 - 50 M; Total - 50 M P/A
19. SUPERSEDED REPORTS: Cancels and supersedes NO 253334 (A 3c-327) dtd 7/15/53
20. REQUIREMENT AND/OR JUSTIFICATION: No aimable clusters of chemical or incendiary bombs exist which are suitable for external suspension on high speed aircraft.
21. BRIEF OF PROJECT AND OBJECTIVE:
 - a. Brief: Develop a cluster that will scatter a greater number of unit bombs in a more efficient manner than present clusters are capable of doing. Cluster to be adaptable to a streamlined shape and suitable for external carrying on high speed aircraft.
 - b. Approach: Design, develop, and test aimable clusters of acceptable aerodynamic shapes and with an efficient dispersal mechanism suitable for external carrying on high speed aircraft.
 - c. Sub-Tasks: Department of the Army (Chemical Corps) will conduct design, development, and test of the clusters. The Bureau of Ordnance will test prototypes to determine their suitability for Naval use.
 - d. Other Information: None.
 - e. Background and/or Progress: Existing clusters of chemical bombs are not suitable for external carriage on aircraft because of their blunt nose and cylindrical design which would cause considerable drag at high speeds. However, as an interim measure, catapult, arrested landing, fit, flight and drop tests were conducted on various Army chemical munitions to determine what modifications, if any, would be required to make them acceptable. All these test results are at present being correlated to determine the next logical step in progress of this program.
 - f. Future Plans: Work has been assigned to the Army Chemical Corps for development of a cluster meeting Navy requirements. As soon as a design has been completed, the Bureau will test these clusters to determine their suitability for Naval use.
 - g. References: None.

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1-A Form Data Sheet

1. PROJECT TITLE: Bombs, Incendiary
2. SECURITY CLASSIFICATION: Confidential
3. PROJECT NUMBER: NO 253335
5. REPORT DATE: 15 July 1954
6. BASIC FIELD OR SUBJECT: Chemical Warfare
7. SUB FIELD OR SUBJECT: Bombs, General; Chemical Bombs
- 7a. TECHNICAL OBJECTIVE: CW-03401
8. COGNIZANT AGENCY: BuOrd
9. DIRECTING AGENCY: BuOrd (Re3c, F. Sirc)
10. REQUESTING AGENCY: BuOrd
12. CONTRACTOR AND/OR LABORATORY: Dept. of the Army (Chemical Corps)
13. RELATED PROJECTS: Cml C Project 4-04-16-10 NO 253334 (A-3c-327)
14. DATE APPROVED: 24 January 1949
15. PRIORITY: 3
17. ESTIMATED COMPLETION DATE: Cancelled
18. FISCAL ESTIMATES: FY 54 - 0; FY 55 - 0; Total - (See 21-f)
19. SUPERSEDED REPORTS: Cancels and supersedes NO 253335 (A-3c-329)
dtd 15 July 1953
20. REQUIREMENT AND/OR JUSTIFICATION: Incendiary bombs of greater efficiency than those in existence are needed. No bomb larger than 500 lbs. exists.
21. BRIEF OF PROJECT AND OBJECTIVE:
 - a. Brief: Using present knowledge and new developments in the field of incendiaries, design and develop incendiary bombs of greater efficiency than those in existence.
 - b. Approach: Evaluate the effectiveness of different types of incendiaries against typical and expected military targets. Based upon this evaluation, choose most promising design and materials, design a bomb of optimum characteristics including suitability for use by carrier-based planes and shipboard stowage.
 - c. Sub-Tasks: Department of the Army (Chemical Corps) will conduct evaluation, design, development and test as directed by the Bureau of Ordnance.
 - d. Other Information: None.
 - e. Background and/or Progress: Considerable work accomplished during the last period by Chemical Corps-BuOrd tests with napalm and other compounds.
 - f. Future Plans: Project is cancelled. Future work will be coordinated and carried on under Project No. 253334 (A-3c-327). Cluster, (Low Drag) Aimable Incendiary.
 - g. References: None.

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1-A Form Data Sheet

1. PROJECT TITLE: C. W. Bombs
2. SECURITY CLASSIFICATION: Confidential
3. PROJECT NUMBER: NO 253364
5. REPORT DATE: 15 July 54
6. BASIC FIELD OR SUBJECT: Chemical Warfare
7. SUB FIELD OR SUBJECT: Bombs, General; CW Bombs
- 7a. TECHNICAL OBJECTIVE: CW-03401
8. COGNIZANT AGENCY: BuOrd
9. DIRECTING AGENCY: BuOrd (Re3c, Mr. F. C. Sirc)
10. REQUESTING AGENCY: BuOrd
11. PARTICIPATION AND/OR COORDINATION: Dept. Army (Chem. Corps) (C)
12. CONTRACTOR AND/OR LABORATORY: Dept. Army (Chem. Corps); NPG, Dahlgren, Va.; Dugway Proving Ground; A. O. Smith Corp.
13. RELATED PROJECTS: NO 253331 (A-3c-321)
14. DATE APPROVED: 10 September 1953
15. PRIORITY: 3
17. ESTIMATED COMPLETION DATES: Dev. 9/54 (See 21-f); Test - 6/55 (See 21-f)
18. FISCAL ESTIMATES: FY 54 - (See 21-f) om; FY 55 - 50 M (See 21-f)
Total 100 M (See 21-f)
19. SUPERSEDED REPORTS: Cancels and supersedes NO. 253334 (A-3c-350)
dtd 9/1/53
20. REQUIREMENT AND/OR JUSTIFICATION: A requirement exists for a long drag Chemical bomb.
- 20A. DIRECTIVE REFERENCE: BuOrd Directive Summary Case 82(70), Ser 15990, of 19 June 1953
21. BRIEF OF PROJECT AND OBJECTIVE:
 - a. Brief: Extensive investigation has established that the needs of the Navy may best be met by a massive type bomb for dissemination of chemical agents.
 - b. Approach: Modify low drag G. P. bombs as necessary to provide test vehicles for determining design requirement for a chemical bomb for massive dissemination of chemical agents. The modified G. P. bombs should provide the Navy with an interim capability in Chemical bombs. Based on the results of the tests, develop a chemical bomb that is suitable for mass dissemination of chemical agents.
 - c. Sub-Tasks: Dept. of the Army (Chemical Corps) has been given the responsibility for modifying the low drag General Purpose bombs as chemical bombs.

NPG will conduct fit, flight, catapult and arrested landing and ballistic tests.

Dugway Proving Ground will conduct dissemination tests.

The A. O. Smith Corporation is furnishing thirty (30) 500-lb. low drag G. P. bombs to be modified by the Chemical Corps.
 - d. Other Information: None.

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21. BRIEF OF PROJECT AND OBJECTIVE: (Continued)

e. Background and/or Progress: Extensive investigation and test of chemical bomb type munitions indicates that the "Massive" type of chemical bomb may be superior in overall features and effectiveness to cluster type munitions BUORD has and is continuing tests of cluster type munitions to determine their compatibility for Naval use. It has been determined that, even though acceptable, chemical clusters tested have disadvantages that will not be encountered with the "Massive" type.

The Army Chemical Center has modified thirty (30) 500-lb. low drag G.P. bomb bodies for chemical agent usage. Eight (8) of these bombs modified with burster tube and simulant loaded were shipped to NPG for tests.

f. Future Plans: Sixteen (16) modified 500-lb. low drag G.P. bombs will be sent to Dugway Proving Ground for dissemination tests. Six (6) will be retained by the Army Chemical Center for surveillance tests. Funding is requested for this item only at this time. Development of other items will be determined after results with the 500-lb. size are received.

g. References: None.

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Annual Report

Item 2972

1-A Form Data Sheet

1. PROJECT TITLE: Chemical Warfare Agents, Dissemination & Devices
2. SECURITY CLASSIFICATION: Secret
3. PROJECT NUMBER: NO 392116
5. REPORT DATE: 1 June 54
6. BASIC FIELD OR SUBJECT: Chemical Weapons
7. SUB FIELD OR SUBJECT: Chemical Warfare
- 7a. TECHNICAL OBJECTIVE: CW-03401
8. COGNIZANT AGENCY: BuOrd
9. DIRECTING AGENCY: BuOrd (Re2a, R. Miller)
10. REQUESTING AGENCY: BuOrd
11. PARTICIPATION AND/OR COORDINATION: Army Chemical Corps (P)
12. CONTRACTOR AND/OR LABORATORY: Army Chemical Corps, Army Chemical Center, Md. WPR - 172 - 54
13. RELATED PROJECTS: NO 253336 (A-3c-350); NO 393201 (B-3b-243); NO 393501 (B-3e-563)
14. DATE APPROVED: 1 February 1949
15. PRIORITY: 3
17. ESTIMATED COMPLETION DATES: Continued
18. FISCAL ESTIMATES: FY 54 - 50 M; FY 55 - 75 M; Total - 75 M/yr.
19. SUPERSEDED REPORTS: Cancels and supersedes NO 392116 (B-2a-618) of 7/15/53
20. REQUIREMENT AND/OR JUSTIFICATION:
 - (a) The improvement of existing white phosphorus loads and the design, development and testing of new white phosphorus loads.
 - (b) The improvement of incendiary agents and incorporation in munitions.
 - (c) Research on toxic components to find chemical warfare agents more effective than those currently available is required.
 - (d) Development of munitions to properly disperse standard chemical agents is necessary.
- 20A. DIRECTIVE REFERENCES: (a) BUORD Directive Summary Serial 13994 of 10 October 1951; (b) BUORD Dir. Sy. Ser. 15849 of 15 May 1953.
21. BRIEF OF PROJECT AND OBJECTIVE:
 - a. Brief: The long range objective of this project is to develop improved chemical warfare agents (toxic, non-toxic and incendiary), to investigate adaptability of standard munitions and the development of new munitions to accommodate chemical-fills and to determine weapon effectiveness and dissemination with various chemical agents, also to develop special devices such as incendiary destructors.
 - b. Approach: (1) Design, develop and test mechanical and chemical features of white phosphorus loads for application in each of the weapons system. This includes improvement of the WP filling itself. (2) Continuous research in incendiary materials including liquid and solid thickeners for gasoline and oil performed by the Army Chemical Corps is being observed. (3) Research and evaluation work on new toxic compounds to determine: (a) Toxicity or vesicancy; (b) Difficulty of detection; (c) Stability (d) Penetration of protective devices, and (e) Efficiency of dispersion

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21. BRIEF OF PROJECT AND OBJECTIVE: (Continued)

(4) Studies are conducted to determine weapon effectiveness with various chemical agents.

c. Sub-Tasks: The Army Chemical Corps, Army Chemical Center, Maryland, has been requested to carry out the work under this project. Under development for the Navy are the following chemical-agent filled munitions:

- (1) 5W0 Spin Stabilized Rocket Head (HD, GB and WP filled)
- (2) 5"/38 projectile (HD and GB filled)
- (3) 5"/54 projectile (HD, GB and WP filled)
- (4) 6"/47 projectile, single and dual purpose (H, GB, and WP filled)
- (5) 500 lb. Low Drag Bomb (GB filled)

Also being conducted under this project are miscellaneous chemical warfare problems.

d. Other Information: FY 1955 funds in the amount of 75M will be made available to the Army Chemical Corps for work under this project.

e. Background and/or Progress: 1. The Chemical Corps in conjunction with the Bureau of Ordnance is developing chemical projectiles, rockets and bombs. The 5"/38, 5"/54, 6"/47 projectiles and 5W0 SS rocket, chemical-filled, have been dynamically fired at the Naval Proving Ground for flight ballistic data. All munitions proved satisfactory ballistically. Static firing tests for dissemination conducted at the Army Chemical Center, Maryland were satisfactory. Proof-firing recovery tests of the 5"/38 and 5"/54 conducted at the Naval Proving Ground indicate that the metal components (bursting well and tube) were unsatisfactory and that better quality steel will be required. Additional tests with the superior metal will be conducted. Provisions are being made for the installation of a 5"/38 gun mount at Dugway Proving Ground for dynamic firing tests to determine dissemination characteristics.

2. 6"/47 White Phosphorus Projectile - Preliminary prototype design of the 6"/47 W.P. Projectile has been delivered to the Naval Proving Ground for proof-pressure firing recovery tests to determine mechanical properties of various components.

5W0 SS Rocket, W.P.-filled has been tested at the Naval Proving Ground for flight ballistic data and found satisfactory.

f. Future Plans: To complete the development of chemical-agent filled munitions listed in 21-c, and continue to investigate adaptability of standard munitions and development of new munitions to accommodate chemical-agent fills.

g. References: Chemical Corps Projects:

- 4-04-15-007 (Dissemination and Exploitation of CW Agents)
- 4-04-15-009 (Special Problems, Munitions Division)
- 4-04-16-019 (Incendiary Munitions)
- 4-04-17-015 (5 and 6 inch Smoke Projectiles)
- 4-09-04-001 (Incendiary Agents, Solid and Viscous)
- 4-10-06-002 (Colored Smoke Load for Rockets)
- 4-04-15-026 (500 lb. Low Drag Bomb)

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21. BACKGROUND AND/OR PROGRESS: (Continued)

- g. References: (Continued)
 - 4-04-15-024 (5 and 6 inch Gas Projectiles)
 - 4-17-07-004 (5-Inch Gas Rocket)
 - 4-17-07-005 (5-Inch Smoke Rocket)

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Item 2972

1-A Form Data Sheet

1. PROJECT TITLE: CW and Auxiliary Projectiles
2. SECURITY CLASSIFICATION: Confidential
3. PROJECT NUMBER: NO 393201
5. REPORT DATE: 1 June 1954
6. BASIC FIELD OR SUBJECT: Chemical Weapons
7. SUBFIELD OR SUBJECT: Chemical Warfare; CW Projectiles
- 7a. TECHNICAL OBJECTIVE: CW-03401
8. COGNIZANT AGENCY: BuOrd
9. DIRECTING AGENCY: BuOrd (Re3-b- T. Shirata)
10. REQUESTING AGENCY: OPNAV
11. PARTICIPATION AND/OR COORDINATION: Army Chemical Corps (C)
12. CONTRACTOR AND/OR LABORATORY: Lansdowne Steel & Iron Co., Morton, Pennsylvania; Dept. of the Army
13. RELATED PROJECTS: NO 392116 (B-2a-618)
14. DATE APPROVED: 4 December 1951
15. PRIORITY: 3
17. ESTIMATED COMPLETION DATES: Continued
18. FISCAL ESTIMATES: FY - 100; FY 55 - 50; Total 60/yr.
19. SUPERSEDED REPORTS: Cancels and Supersedes NO 393201 (B-3-b-243) of 7/15/53
20. REQUIREMENT AND/OR JUSTIFICATION:

A need exists for dissemination of chemical warfare agents and other auxiliary defensive and offensive weapons using 5" and 6" caliber projectiles.
- 20A. DIRECTIVE REFERENCES: (a) BUORD D. S. Case 40(475) 47(233) Ser 13994 of 10 Oct 1951; (b) BUORD D. S. Case 40(507) Ser. 14220 of 4 Jan 1952; (c) BUORD D. S. Case 40(475a) 47(233a) Ser 16302 of 16 Sep 1953.
21. BRIEF OF PROJECT AND OBJECTIVE:
 - a. Brief: Design and develop prototype 5" & 6" caliber projectiles for dissemination of C.W. agents as outlined in directive references.
 - b. Approach: Design and develop projectiles suitable for the dissemination of W.P. and liquid C.W. agents. Initial efforts will involve testing existing 5" and 6" H.C. and illuminating projectile bodies with liquid loading and W.P. loading respectively. Long range program is to design and develop improved method to seal the liquid agents more economically.
 - c. Sub-Tasks: The Army Chemical Corps will modify existing H.C. projectile bodies for the chemical load and conduct evaluation tests principally at Army Chemical Center, Edgewood, Md., and Dugway Proving Ground, Tooele, Utah, in connection with Project No. 392116 (B-2a-618), Chemical Warfare Agent Dissemination. U. S. Naval Proving Ground, Dahlgren, will conduct recovery firing tests for evaluation of metal parts design and ballistic tests for flight characteristics. Lansdowne Steel and Iron Company will manufacture a quantity of experimental 5"/38 Chemical projectile bodies, burster walls, and burster tubes.

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21. BRIEF OF PROJECT AND OBJECTIVE: (Continued)

d. Other Information: "None"

e. Background and/or Progress: A limited quantity of 5"/38 experimental illuminating bodies, which will utilize current service W. P. and illuminating loads, is being procured. Design was initiated to accent future fuze developments and to have ballistic matching with current H.C. service projectiles. Present service fuzes may be used with an adapter. Modified 5"/38, 5"/54 and 6"/47 H.C. bodies loaded with an inert liquid chemical simulant have been ranged satisfactorily compared with H.C. projectiles. A plastic Sabot has been developed so that the 5"/38 projectile can be fired from the Army 155MM gun at Edgewood for dissemination tests. Firing tests indicate that proper fuze action will be obtained. Recovery firing and examination of inert chemical 5"/38 and 5"/54 projectiles, modified by Army Chemical Center; revealed deformation of burster tubes and burster wells in 5"/38 projectiles and crack failures of burster wells in 5"/54 projectiles. Examination of failures and modification of additional inert chemical 5"/38 and 5"/54 projectiles with higher strength components, by Army Chemical Center, has resulted in considerable delay in the program. A solid base 5"/38 projectile has been designed for the liquid load. A limited quantity is being procured for evaluation tests.

f. Future Plans: Ballistic matching of W.P. loading (similar to type of load in 5"/38) in current 5"/54 and 6"/47 illuminating projectile bodies will be conducted when such loading has been developed under Project Number 392116 (E-2a-618), Chemical Warfare Agent Dissemination. Recovery firing tests and ballistic tests on solid base 5"/38 projectile with inert liquid chemical simulant will be conducted when they become available. A solid base 5"/54 and 6"/47 will be designed for the liquid filler. For long range planning, design and development of a more economical type seal for chemical projectiles is anticipated.

g. References:

NPG Dahlgren Range Sheets Number 5730-3248; 5729-3247; 1267; 1266; 5786-396; 5785-395.

NPG ltr OMB:JCB;ms All/36-243-1 ser 34527 of 15 July 1953 to BUORD.

NPG ltr report XI-1(P-143) 1688-722 042354 0231 of 21 April 1954.

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Project Data Sheet

1. PROJECT TITLE: Chemical Warfare Rockets
2. SECURITY CLASSIFICATION: Secret
3. PROJECT NUMBER: NO 393501
4. INDEX NUMBER: B-3e-563
5. REPORT DATE: 1 June 1954
6. BASIC FIELD OR SUBJECT: Chemical Weapons
7. SUB FIELD OR SUBJECT: Chemical Warfare
- 7a. TECHNICAL OBJECTIVE: CW-03401
8. COGNIZANT AGENCY: BUORD
9. DIRECTING AGENCY: BUORD (Re3e, H. Silk)
10. REQUESTING AGENCY: OPNAV
11. PARTICIPATION AND/OR COORDINATION: Army Chem Corps (C)
12. CONTRACTOR AND/OR LABORATORY: NOTS, Inyokern, Calif.; Army Chemical Center, Md.; NPG, Dahlgren, Va.
13. RELATED PROJECTS: NO 253336 (A-3c-350), NO 392116 (B-2a-618), NO 393201 (B-3b-243)
14. DATE APPROVED: February 12, 1952
15. PRIORITY: 3
17. ESTIMATED COMPLETION DATES: Dev - 10/54; Test - 11/54; Op-Eval.- 6/55
18. FISCAL ESTIMATES: 54 - 43M; 55 - 25M; T - 110M
19. SUPERSEDED PROJECTS: Cancels and superseded NO 393501 (B-3e-563) of 7/15/53
20. REQUIREMENT AND/OR JUSTIFICATION: A requirement exists for means of dissemination, by ships and infantry units, of chemical warfare agents in suitable concentrations.
- 20a. DIRECTIVE REFERENCES: (a) OPNAV Ser 1084P34 of 5 Aug 1949; (b) OPNAV ltr Op-342 MI NT A1-1 Ser 1533P34 of 6 Oct 1949; (c) BUORD D.S. Ser 13994 of 10 Oct 1951.
21. BRIEF OF PROJECT AND OBJECTIVE:
 - a. Brief: This project will result in the development of barrage rockets fitted with heads suitable for dissemination of chemical warfare agents, including smoke.
 - b. Approach: Investigate existing 5"0 spin stabilized rocket motors and heads to determine their suitability, with modifications, as chemical warfare rockets. If modification of existing rocket motors and heads is determined to be impractical, new designs will be initiated.
 - c. Sub-Tasks: Army Chemical Center - Investigate whether the present 5"0 Rocket Head Mk 14 Mod O, modified, is suitable for loading and dissemination of CW agents, including GB.
 - b. If required, the Naval Ordnance Test Station, Inyokern, will undertake redesign of the rocket motor, or design and develop a new one, to accommodate whatever head design the chemical Center determines to be suitable.
 - d. Other Information: None.

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- e. Background and/or Progress: Preliminary evaluation by the Army Chemical Center indicates that dissemination efficiency of modified 5"0 Mk 14 Mod 0 Rocket Heads compares favorably with other chemical munitions of similar caliber. Simulant inert filled rocket heads fired at the Naval Proving Ground for flight ballistics were found satisfactory in comparison with HE filled rocket heads for the same rounds.
- f. Future Plans: Procurement has been initiated for a quantity of 300 rocket heads, similar to the modified 5"0 Mk 14 Mod 0 Rocket Heads tested, for more extended tests by the Army Chemical Center.
- g. References: None.

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DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF CHEMICAL OFFICER
Chemical Corps Technical Committee
Army Chemical Center, Maryland

CMLWH

11 February 1955

MEMORANDUM FOR RECORD

SUBJECT: ARDC Project No. 5166, Airborne Dispersing Equipment for BW
and CW Munitions (C)

The attached data sheet for the subject Air Force project is re-
produced as information pertinent to certain portions of the Chemical
Corps BW and CW R&D programs.

FOR THE CHAIRMAN, CHEMICAL CORPS TECHNICAL COMMITTEE:

T. S. Eckert

Incl
Data Sheet for
Project 5166

T. S. ECKERT
Secy, CCTC

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6689 S
New Project

Item 2990

Project Data Sheet

1. PROJECT TITLE: Airborne Dispersing Equipment for BW and CW Munitions (C)
2. SECURITY CLASSIFICATION: Secret
3. PROJECT NUMBER: 5166
5. REPORT DATE: 6 May 1954
6. BASIC FIELD OR SUBJECT: Operational Support Equipment
7. SUB FIELD OR SUBJECT SUBGROUP: Chemical, Biological and Radiological Weapons (36)
- 7a. TECHNICAL OBJECTIVE: CW-3; BW-5
8. COGNIZANT AGENCY: ARDC
9. DIRECTING AGENCY: WADC, Armament Laboratory; WCLGW-1; Telephone No. 2-8252
10. REQUESTING AGENCY: Headquarters ARDC
11. PARTICIPATION, COORDINATION AND/OR INTEREST: Dept. of the Army, Chemical Corps (I); AMC (P)
12. CONTRACTOR AND/OR LABORATORY: Not Established
13. RELATED PROJECTS: Essential: None; Required: None
14. DATE APPROVED: 28 April 1954
15. PRIORITY: 1-B
16. 5-5166
17. ESTIMATED COMPLETION DATES: Dev. - Jan 57; Test - Jan 58
18. FISCAL ESTIMATES: FY 54 - 1M; 55 - 122M; 56 - 114M; 57 - 56M; 58 - 1M; T - 297M
20. REQUIREMENT AND/OR JUSTIFICATION: A means of accurately dispersing BW-CW bomblets by fighter-bomber aircraft against targets of opportunity is required. Efficient utilization of present cluster type munitions necessitates use of a release altitude considered relatively high for a fighter-bomber delivery technique. By using a device which releases bomblets directly from a fighter-bomber aircraft, the pilot can reconnoiter at relatively low altitude and identify and select a target of opportunity. The bomblets can then be released over the target with a high degree of accuracy. An additional advantage of a dispenser over a cluster type munition is that a dispenser will permit carrying of a greater payload of bomblets since there is no need for a long hollow tail section for free fall stabilization purposes as is required by a cluster. (SECRET)
While this technique will be primarily applicable to delivery of CW munitions, consideration will be given to possible application to Biological Warfare. (SECRET)
In the development of dispenser for fighter type aircraft, there is a need to determine whether an initial velocity should be imparted to bomblets to improve their separation (safe release) and dispersion characteristics. (UNCLASSIFIED)

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21. BRIEF OF PROJECT AND OBJECTIVE:

a. Brief. - This project will result in the development of dispensing equipment which can be carried on standard pylon and bomb racks of fighter-bomber aircraft and eject small munitions at a constant rate so as to obtain an approximate equivalent and predetermined spacing of the munitions on the target. (UNCLASSIFIED)

b. Approach. - Two approaches will be made. One will be to adopt a Mabfrag bomb container for CW-BW munition distribution. The other approach will be to develop ejection tubes which will be designed and fabricated utilizing compressed air as the power source for ejection. Tests will be made to determine optimum initial pressure and volume to obtain the required rate of ejection. The data obtained from these tests on air power supplies will be used as design criteria for the development of powder charges to generate pressure and gas volume required.

After the development of a satisfactory system, the problem will be simply one of designing a tube for the munition load and assembling the tubes in a container which can be carried on the standard pylon and rack system of fighter-bomber aircraft. (CONFIDENTIAL)

c. Subtasks:

Task 50568: "Dispenser for EW-CW Type Bomblets" (C) (SECRET TASK)

Contractor: Not established

Contract No:

Objective: To develop a dispenser system for dispersing large quantities of EW-CW munitions from fighter-bomber aircraft, and to obtain a uniform spacing between individual bomblets on the target area.

Estimated Completion Dates: 1. Study - March 1955
2. Experimental - January 1956
3. Development - January 1957
4. Test - January 1958

Coordination: WADC

Armament Laboratory, WCLG
Aircraft Laboratory, WCLS
Experimental Fabrication Laboratory, WCUD.

AMC:

Procurement Division, MCP
Maintenance Division, MCM

AFAC, ACOP

HADC, HDOR

U.S. Army

Chemical Corps, Biological Laboratories

(CONFIDENTIAL)

Task 50569: "Modification of "Mabfrag" Dispenser for BW-CW Type Bomblets" (C) (SECRET TASK)

Contractor: Not established

Contract No:

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Task 50569 (continued)

Objective: To modify the present developmental type "Mabfrag" dispenser design in order to serve as a test vehicle for determining feasibility or obtaining an immediate capability for dispersing BW-CW type munitions.

Estimated Completion Dates: 1. Study - January 1955
2. Experimental - January 1955
3. Developmental - July 1955
4. Test - January 1956

Coordination: WADC

Equipment Laboratory, WCBL
Aircraft Laboratory, WCLS
Experimental Fabrication, WCUD

AMC

Procurement Division, MCP
Maintenance Division, MCM

AFAC, ACOP

HADC, HDOR

U. S. Army

Chemical Corps, Biological Laboratories
(CONFIDENTIAL)

d. Other Information

- (1) Reference Item 11, the Chemical Corps, will be interested in this project, since it involves the dissemination of BW and CW Munitions, being developed by that agency. AFAC will conduct tests. (CONFIDENTIAL)
- (2) The Air Material Command will be required to furnish P135 funds amounting to approximately \$100,000 in FY 1955 for the procurement of Service Test dispensers under Task 50569. \$100,000 will be required in FY 56 and 57 for procurement of two service test dispensers and dummy bomblets for Task 50568. (UNCLASSIFIED)

e. Background History:

No previous work has been accomplished on this specific method or delivery of BW-CW bomblets by fighter-bomber aircraft. However, related work on the "Mabfrag" dispenser under project 5113 has demonstrated feasibility of delivery of small bomblets by use of a dispenser. (CONFIDENTIAL)

f. References: None

REASON FOR SECURITY CLASSIFICATION: This document is classified SECRET since it reveals intent to obtain offensive capability in Biological Warfare. This is in accordance with the policy expressed in letter from Hq, USAF (AFOAT) to all major Commands, dated 16 December 1952, subject: "(Unclassified) Classification Guide for Matters Concerning Biological Warfare and Chemical Warfare."

This document is classified SECRET per par 23.c of AFR 205-1.

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READ FOR RECORD

Copy No. _____
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Item 2999

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF CHEMICAL OFFICER
Chemical Corps Technical Committee
Army Chemical Center, Maryland

CMLWH

14 March 1955

MEMORANDUM FOR RECORD

SUBJECT: ARDC Project No. 6017, Rapid Detection Equipment for CW
Agents in Operating Aircraft (U)

The attached data sheet for the subject Air Force project
is reproduced as information pertinent to Chemical Corps sub-project
4-08-06-030-03.

FOR THE CHAIRMAN, CHEMICAL CORPS TECHNICAL COMMITTEE:

Incl
Data Sheet for
Project 6017

T. S. Eckert
T. S. ECKERT
Secy, CCTC

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WH5992
1:

Project Data Sheet

1. PROJECT TITLE: Rapid Detection Equipment for CW Agents in Operating Aircraft (U)
2. SECURITY CLASSIFICATION: Secret
3. PROJECT NUMBER: 6017
5. REPORT DATE: 12 January 1955
6. BASIC FIELD OR SUBJECT: Strategic Air Warfare Systems Development
7. SUBFIELD OR SUBJECT SUBGROUP: Toxicological Weapons Defense (62)
- 7a. TECHNICAL OBJECTIVE: CW-4a
8. COGNIZANT AGENCY: Air Research & Development Command
9. DIRECTING AGENCY: Equipment Laboratory, WADC
10. REQUESTING AGENCY: Headquarters, USAF
11. PARTICIPATION, COORDINATION, INTEREST: Army Chemical Corps (P) (AR)
BuAer (I)
12. CONTRACTOR AND/OR LABORATORY: Army Chemical Corps
13. RELATED PROJECTS: (E) 100A, 101A; (R) 100B, 114B, Army Chem. Corp
Proj 4-08-06-006 and 4-08-06-015
14. DATE APPROVED: 23 April 1953
15. PRIORITY: 2
17. ESTIMATED COMPLETION DATES: Dev - Jun 56
Test - Jun 56
18. FISCAL ESTIMATES: Prior - 256M; 55 - 23M; 56 - 253M; Total - 532M
19. SUPERSEDED REPORTS: This Report supersedes report on this Project dated 9 March 1954
20. REQUIREMENT AND/OR JUSTIFICATION: This project will result in equipment which will fulfill an operational requirement established by Hq USAF, as directed by Hq ARDC in Development Directive 3014-J1. The equipment obtained will be capable of rapid detection of CW agents in operating aircraft. No equipment capable of performing this function now exists. The target date for availability of prototypes for operational suitability test has been extended from June 1954 to June 1956 by Hq ARDC, and the later date appears to be a realistic target date. (SECRET)
21. BRIEF OF PROJECT AND OBJECTIVE:
 - a. Brief. - The equipment will warn aircrews in the event of the escape of a CW agent carried within the aircraft. It will be capable of continuous and automatic operation under all flight conditions. Interim equipment capable of detecting only GB was available by the first Target Date, June 1954. By the time of the revised Target Date, June 1956, it is anticipated that final development and testing will be completed on a satisfactory item. The interim system operates on a principle of the quenching of the fluorescence of certain chelated compounds such as aluminum morin under ultraviolet light when the pyrolysis products of GB are present. The principle and design of the final equipment will be based upon the results of work being conducted for the Air Force under Chemical Corps projects 4-08-06-015 and 4-08-06-006 and flight tests performed at WADC. (SECRET)
 - b. Approach. - Final USAF design will be based upon results of investigations on detection principles and development as conducted under Chemical Corps projects 4-08-06-006 and 4-08-06-015, a contract with Mine Safety Appliance Company, and the results of WADC flight tests of prototype instruments. The establishment of detection

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Item 2999

capabilities for specific CW agents will be timed to coincide, insofar as practical, with the establishment of an AF capability to deliver these agents. All basic research and development common to all the services in the field of CW agent detection will be the responsibility of the Army Chemical Corps. Funds in the amount of \$150,000 on Cross Servicing Order in FY52 and FY53 and contract for \$101,000 with Mine Safety Appliance Company in FY54 were transferred to the Chemical Corps for the prosecution of this project. (SECRET)

c. Subtasks - None

d. Other Information

(1) The Chemical Corps, Department of the Army, has the Area Responsibility for research and development in the field of CW detection. This project will be accomplished primarily by Cross Servicing Order to the Army Chemical Corps, and in close coordination with interested Navy Bureaus. The Chemical Corps will conduct most of the test work, with flight testing to be conducted by WADC. (CONFIDENTIAL)

(2) Funding

	<u>Previous</u>	<u>FY 55</u>	<u>FY 56</u>
Labor	\$ 4,000	\$ 2,000	\$ 2,000
Travel	1,400	1,100	750
Contract Services	251,000	20,000	250,000
Total R&D Funds	255,400	23,100	252,750
Material	0	1,000	1,000
Total Funds	255,400	24,100	253,750
Manhours	1,600	500	800

(SECRET)

(3) Facilities - Facilities, aircraft and flight personnel as required for flight testing will be furnished by WADC. (UNCLASSIFIED)

e. Background History - In 1950 Hq USAF directed the development of an airborne instrument capable of rapid detection and identification of an airborne toxic (CW and BW) agents. Action was initiated under RDO 655-1591 to support the necessary applied research being conducted under Army Chemical Corps project 4-08-06-015. No single instrument capable of rapid detection and identification of all CW and BW agents, nor any principle on which such an instrument could be based, is known to exist. In view of this, Headquarters USAF prepared revised Military Characteristics in which detection of CW Agents is considered separately. Close liaison was maintained between WADC and the Army Chemical Center while areas of responsibility were being defined by Hq USAF. In January 1953 a TWX from HqARDC gave the authority to proceed in the project implementation of the Development Directive. Cross Servicing Orders were written to the Chemical Corps in FY52 and FY53. Several field alarms, one of which is of sufficiently small size and weight to offer promise of suitability for AF use (E22R1), are being developed under Chemical Corps project 4-08-06-006. In July 1953, official copies of Military Characteristics were received by WADC. In November 1953, procurement action covering the investi-

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gation of new principles of toxic chemical agent detection for use in operating aircraft was initiated. Proposals were evaluated and the Mine Safety Appliance Company was awarded contract AF 33(616)-2526, which was then transferred to the Chemical Corps for technical guidance and administration. (SECRET)

f. Future Planning - The Army Chemical Corps and the Air Force will conduct a joint test on field alarms developed by the Chemical Corps in order to determine their suitability for use in operating aircraft. As a result of these tests, it will be determined what modifications will be required in order to make the instrument reliable and sufficiently sensitive for use in aircraft. In addition, the Chemical Corps will continue to investigate new principles of detection under the projects previously cited. (UNCLASSIFIED)

g. References

- (1) Development Directive 3014-J1, (SECRET), Hq ARDC, dated 10 June 1952, title: (U) System to Detect CW Agents in Aircraft.
- (2) Military Characteristics No. 328 (SECRET), Directorate of Requirements, DCS/D, Hq USAF, dated 3 February 1953, Title: (U) Rapid Detection System for Toxic CW Agents in Operating Aircraft.
- (3) ARDC Project Development Directive No. 6017 (SECRET), Hq ARDC, dated 7 July 1954.

(UNCLASSIFIED)

h. Project Officer

J. D. S. Gibson, 1st Lt. USAF
WCLEM-3 39239

This document is classified SECRET in accordance with par 23C of AFR 205-1.

C4-58858-A

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