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✓ L16-4

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DEPARTMENT OF THE NAVY
OFFICE OF THE SECRETARY
WASHINGTON

18 DEC 1953

From: Secretary of the Navy
To: Commander, Naval Air Materiel Center

Subj: Experimental Studies of a Medical Nature Involving Persons
in the Naval Establishment

- Ref: (a) HANAYEN ltr NS-L-PAS:ad All (2572) of 6 Nov 1953
- (b) HANAYEN ltr NS-L-PAS:ad All (2573) of 6 Nov 1953
- (c) HANAYEN ltr NS-L-PAS:ob All (2574) of 6 Nov 1953
- (d) HANAYEN ltr NS-L-PAS:ob All (2577) of 6 Nov 1953

1. Authorization to conduct experimental studies of a medical nature involving persons in the Naval Establishment as specified in references (a), (b), (c), and (d) is hereby granted.
2. No authority exists to pay volunteers for their hazardous work in connection with these studies.

Copy to:
DUPRES
DUANE
BUNKER

J. H. SMITH, Jr.
Assistant Secretary of the Navy for Air

FILES KIOS (2)

Prepared by:
Cdr. D. R. FitzGerald, USN (Pers-A112)
Room 2054, Arlannex, extension 41865
12/9/53

RETURNED TO ORIGINATOR FOR
MAILING THIS DATE 18 DEC 1953
/s/ [Signature]

CLEARED [Signature] DESK
Date 12-18 Int [Signature]

OFFICIAL FILE
SEC - NAV

BUPERS-1112-nd

THIRD ENDORSEMENT on NAMATCEN ltr XG-1-FAS-nd All (2592) of 6 Nov 1953

11 DEC 1953

From: Chief of Naval Personnel
To: Secretary of the Navy

Subj: Experimental studies of a medical nature involving persons in the
Naval Establishment

1. Forwarded.

2. The Chief of Naval Personnel recommends approval of the request stated
in the basic letter.

J. L. HOLLOWAY, JR.
USN
Chief of Naval Personnel

Copy to:
NAMATCEN
BUAER
BUMED

BUMED-535:adjf
All/A21
18 Nov 1953

SECOND ENDORSEMENT on NAMATCHER ltr NC-1-PAS:sd All (2592) of 6 Nov 1953

From: Chief, Bureau of Medicine and Surgery
To: Secretary of the Navy
Via: ✓ Chief of Naval Personnel

Subj: Experimental studies of a medical nature involving persons in the
Naval Establishment

1. Forwarded, recommending approval.
2. Based on prior studies of effects of extreme climatic conditions on human subjects, this Bureau is of the opinion that the proposed investigation will not result in physical harm or injury to volunteers utilized.

LARGDON C. NEWMAN
by direction

Copy to:
NAMATCHER
BUAER (AE-521)

Ser-AF-521
J26-2/2

148648

FIRST ENDORSEMENT on NAMATCEN ltr XG-1-FAS:sd All (2592)
of 6 November 1953

14 NOV 1953

From: Chief, Bureau of Aeronautics
To: Secretary of the Navy
Via: (1) Chief, Bureau of Medicine and Surgery
 (2) Chief of Naval Personnel

Subj: Experimental studies of a medical nature involving persons
 in the Naval Establishment

1. Forwarded.
2. The Chief of the Bureau of Aeronautics recommends approval
of the request stated in the basic letter.

J. E. SULLIVAN
By direction

Copy to:
NAMATCEN

BUPERS-1112-01

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THIRD ENDORSEMENT on NAMATGEN ltr NG-1-PAS:sd All (2593) of 6 Nov 1953
11 DEC 1953

From: Chief of Naval Personnel
To: Secretary of the Navy

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Subj: Experimental studies of a medical nature involving persons in the
Naval Establishment

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1. Forwarded.

2. The Chief of Naval Personnel recommends approval of the request stated
in the basic letter.

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J. L. HOLLOWAY, JR.
Vice Admiral, USN
Chief of Naval Personnel

Copy to:
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OPMED-5361ajf
ALL/421
30 Nov 1953

SECOND ENCLOSURE on HAMATCEN ltr AG-1-120:sd All (2593) of 3 Nov 1953

From: Chief, Bureau of Medicine and Surgery
To: Secretary of the Navy
Via: Chief of Naval Personnel

Subj: Experimental studies of a medical nature involving persons in the
Naval Establishment

1. Forwarded, recommending approval.
2. Based on prior studies involving protective clothing during which human volunteers were utilized and on precautions established by enclosure (2) of the basic correspondence, this Bureau is of the opinion that the subject investigation will not result in physical harm or injury to volunteer subjects.

LANGDON C. NEWMAN
By direction

Copy to:
HAMATCEN
SUAER (AG-525)

Aer-4F-525
J26-2/1

151134

20 NOV 1953

FIRST ENDORSEMENT on NAMATOPH ltr NG-1-FAS:ed All (2593)
of November 1953

From: Chief, Bureau of Aeronautics
To: Secretary of the Navy
Via: (1) Chief, Bureau of Medicine and Surgery
(2) Chief of Naval Personnel

Subj: Experimental studies of a medical nature involving persons
in the Naval Establishment

1. Forwarded.
2. The Chief of the Bureau of Aeronautics recommends approval
of the request stated in the basic letter.

J. E. SULLIVAN
By direction

Copy to:
NAMATOPH

ADDRESS REPLY TO
NAVAL AIR MATERIAL CENTER
U. S. NAVAL BASE STATION
PHILADELPHIA 12, PA.
AND REFER TO NO.

NAVAL AIR MATERIAL CENTER

XG-1-P'S ad
All PHILADELPHIA, PA.
(2593)

From: Commander, Naval Air Material Center
To: Secretary of the Navy
Via: (1) Chief, Bureau of Aeronautics
(2) Chief, Bureau of Medicine and Surgery
(3) Chief of Naval Personnel

Subj: Experimental studies of a Medical Nature involving persons
in the Naval Establishment

Ref: (a) Article 1-17, Manual of the Medical Department 1949

Encl: (1) BUAIR ltr Asst-AB-525 Serial 5111 of 14 Jun 1953
(2) Basic project outline for enclosure (1)

1. In accordance with reference (a), approval is requested to allow full utilization of volunteers from the Naval Establishment to meet requirements of enclosure (1).
2. As required by reference (a) an experimental design proposed for these studies is submitted as enclosure (2).
3. An appropriate physical examination will be conducted prior to the experiment and immediately afterwards. All pertinent information will be recorded as outlined in paragraph (3) of reference (a).

SEARCHED
SERIAL

DEPARTMENT OF THE NAVY
BUREAU OF AERONAUTICS
WASHINGTON 25, D.C.

Aer-AE-525
5111
14 Jan. 1953

UNCLASSIFIED

From: Chief, Bureau of Aeronautics
To: Commander, Naval Air Materiel Center

Subj: TED MAK AE 5223; Flight Clothing, Investigation to improve effectiveness of

Encl: (1) Project Details Enclosure Rec'd

1. Priority: "C" Project Classification: Unclassified.
2. Costs are chargeable to: Allotment "E", Bureau Control Number 51260
3. Desired Completion Date: Earliest practicable date compatible with evaluation of changes indicated.
4. Operational Objective or Requirements: To investigate the suitability of standard items of aeronautical clothing and to make recommendations and/or design changes which will increase the effectiveness of this type of equipment, with particular emphasis on clothing supplied for cold weather use.
5. Abstract of Project: Studies shall be made of current equipment utilized by USN, USAF, and other allied services when indicated, to determine that optimum designed effectiveness and best suited materials are prescribed which will afford maximum protection with minimum of bulk.
6. Cognizant BuAer Engineer: Mr. W. H. Payne, Aer-AE-525, Room 1N45, Extension 64038.
7. Source of equipment: From stock, USAF sources, local manufacture, and interested commercial sources.
8. Disposal of equipment: At discretion of the Naval Air Materiel Center unless otherwise directed by the Bureau of Aeronautics.
9. Number of Reports required (Final): Ten (10)

UNCLASSIFIED

EP

J. Y. LICHTENWALNER
By direction

Enclosure (1)

UNCLASSIFIED

PROJECT DETAILS

Subj: TED NAV AE 5223; Flight Clothing, Investigation to improve effectiveness of

1. This requested study is to evaluate the current equipment utilized in the Navy and other military services and to make recommendations and/or design changes in this equipment to increase its effectiveness.
2. In the investigation of this equipment consideration should be given to various fabric constructions studied under TED FAM AE 525080 in all its phases, considering the various desirable physical characteristics for this equipment.
3. Particular consideration should be given to clothing for cold weather use, with emphasis on the following:
 - (a) Type of closure
 - (b) Physical comfort to individual while engaged in flight duties and effectiveness in resisting wet and/or dry cold in event of personnel being forced down in cold climates.
 - (c) Utilization of newer and improved fabrics to effect a reduction in weight and bulkiness.
 - (d) Knee comfort to allow more freedom of movement, and better utility of pockets.
4. Commercially available fabrics, as well as manufacturing processes should be considered in the evaluation of this equipment. Some typical manufacturers are as follows:
 - Collins and Alkman Corporation (Fabrics)
200 Madison Avenue
New York 16, New York
 - Sydney Blumenthal & Company, Inc. (Fabrics)
1 Park Avenue
New York 16, New York
 - Hillis & Geiger (Clothing)
51 W 21 Street
New York, New York
 - Drybak Corporation (Clothing)
Binghamton, New York
 - L. W. Foster Sportswear Company (Clothing)
Philadelphia, Pennsylvania
5. It is recommended that work done in this field by other services be reviewed and studied upon initiating this project, and that consultation with industry be made when necessary.

Enclosure (1)

OUTLINE OF PROPOSED PROCEDURES FOR STUDYING THE EFFECTS OF
EXTREME CLIMATIC CONDITIONS ON VOLUNTEER SUBJECTS WEARING
EXPERIMENTAL FLIGHT CLOTHING

1. All volunteer subjects will be protected by experimental test garments.
2. When indicated subjects will be instrumented to record and observe skin and rectal temperature and/or loss of fluid.
3. While volunteer subjects are so protected they will be exposed to ambient air temperatures ranging from +135°F to -67°F for periods well within the range of human tolerance.
4. Medical observer will be present.
5. Previous tests have indicated that there is little danger in these tests and all possible precautions will be observed.
6. Subjects will include both military and civilian volunteers.
7. Volunteer subjects will be in constant communication with the controlling project engineer or qualified observer.

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DWS

THIRD ENDORSEMENT on HAMATCHEN ltr HL-3-2AS:bob All (2596) of 6 Nov 1953

From: Chief of Naval Personnel
To: Secretary of the Navy

11 DEC 1953

1116
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Subj: Experimental studies of a medical nature involving persons in the Naval Establishment

1. Forwarded.
2. The Chief of Naval Personnel recommends approval of the request stated in the basic letter.

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J. L. HOLLOWAY, JR.
Vice Admiral, USN
Chief of Naval Personnel

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Copy to:
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WHEED-714:jb

All/A21

3 Dec 1953

SECOND ENDORSEMENT IN MATRGEN ltr XO-1-EAS:beb All (2596) of 6 Nov 1953

From: Chief, Bureau of Medicine and Surgery

To: Secretary of the Navy

Via: Chief of Naval Personnel

Subj: Experimental studies of a medical nature involving persons in
the Naval Establishment

1. Forwarded.

2. The Chief of the Bureau of Medicine and Surgery recommends approval of
the request stated in the basic letter.

A. D. WHEED

By direction

Copy to:

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Per-Air-511
J28-1/4

152385

NOV 10 1953

FIRST ENDORSEMENT on NAMATGEN ltr XG-1-PAS:beb All (2596) of 6 Nov 1953

From: Chief, Bureau of Aeronautics
To: Secretary of the Navy
Via: (1) Chief, Bureau of Medicine and Surgery
 (2) Chief of Naval Personnel

 Subj: Experimental studies of a medical nature involving persons in
 the Naval Establishment

1. Forwarded.
2. The Chief of the Bureau of Aeronautics recommends approval of the request stated in the basic letter.

J. E. SULLIVAN
By direction

NAVAL AIR MATERIAL CENTER
PHILADELPHIA 12. PA.

IN REPLY REFER TO:
XG-1-FAS:beb
All
(2596)

From: Commander, Naval Air Material Center
To: Secretary of the Navy ✓
Via: (1) Chief, Bureau of Aeronautics
(2) Chief, Bureau of Medicine and Surgery
(3) Chief of Naval Personnel

Subj: Experimental studies of a medical nature involving persons in
the Naval Establishment

Ref: (a) Article 1-17, Manual of the Medical Department 1949

Encl: (1) BUAER ltr Aer-AE-322, 40249 of 24 Apr 1951
(2) Basic project outline for enclosure (1)

1. In accordance with reference (a), approval is requested to allow for full utilization of volunteers from the Naval Establishment to meet requirements of enclosure (1).
2. As required by reference (a) the experimental design proposed for these studies is submitted as enclosure (2).
3. An appropriate physical examination will be conducted prior to the experiment and immediately afterwards. All pertinent information will be recorded as outlined in paragraph (3) of reference (a).

DEPARTMENT OF THE NAVY
BUREAU OF AERONAUTICS
WASHINGTON 25, D. C.

Aer-AE-322
40249
24 April 1951

From: Chief, Bureau of Aeronautics
To: Commander
Naval Air Material Center

Subj: TED NO. NAM AE 519064, Oxygen Warning Indicator
Vibratory, Development and Test of

1. One model XD 725577 oxygen regulator, XD 730990-1 audio warning device, and one oxygen warning light are being forwarded for test and evaluation to determine the suitability of this oxygen warning system for use in naval aircraft.
2. The oxygen regulator is a standard 2872-A1 oxygen regulator with electrical contacts installed in the flow indicator and an electrical shut-off switch in the shut-off valve to activate the electrical circuit whenever the oxygen is not being used. The audio warning device is designed to be integrated with the radio circuit and transmit warnings to the user via the earphone. A poloroid cover has been installed over the warning light in order that the light intensity may be varied as operational requirements may require.
3. It is requested that the vibrator be developed for integration into the warning system and attachment to the user's helmet in such a manner that when a warning is given vibration will be transmitted to the audio vibratory senses via the mastoid process bone.
4. It is desired that this evaluation compare the various methods of warning to determine the relative merits of the visual, audio, and vibratory methods and requirements for one or more of these methods in an aircraft system.
5. It is further requested that nineteen copies of the report of these tests be forwarded to the Bureau of Aeronautics when the project is completed.
6. TED No. NAM AE 519064 is assigned to this project with a "C" priority and it is requested that this number be referred to in all future correspondence on this subject. Expenses incidental to this project are chargeable to allotment E, Bureau Control No. 51260.

J.E. SULLIVAN
By direction

Enclosure (1)

**OUTLINE FOR PROPOSED PROCEDURES FOR TEST AND DEVELOPMENT
OF THE OXYGEN WARNING INDICATOR VIBRATORY**

1. Volunteer subjects will be exposed to varying degrees of anoxia within the safe limits of human tolerance and at various altitudes up to 43,00 feet under the following condition. Alveolar samples will be taken from each volunteer subject for oxygen analysis.
 - a. Normal temperature.
 - b. Auxiliary standard breathing system will be provided for each subject for emergency use.
 - c. While so protected the volunteer subjects will be equipped with the standard A-13A oxygen mask incorporating various oxygen want warning devices.
 - d. Medical observer will be present.
 - e. The degrees of anoxia will be controlled by visual acuity, acoustics and muscle response tests.
 - f. Volunteer subjects will be in constant radio communication with the controlling project engineer.
2. Previous tests have indicated that there is little danger of injury in these tests and all possible precautions will be observed.
3. The subjects will include both military and civilian volunteers.

BUFERS-1112-nd

11 DEC 1953

THIRD ENDORSEMENT on NAMATGEN ltr XB-1-4AS:beb All (2597) of 6 Nov 1953

From: Chief of Naval Personnel
To: Secretary of the Navy

Subj: Experimental studies of a medical nature involving persons in
the Naval Establishment.

1. Forwarded.
2. The Chief of Naval Personnel recommends approval of the request stated
in the basic letter.

J. W. ... RAY, JR.
Vice Admiral, USN
Chief of Naval Personnel

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NOV 11 1953

FIRST ENDORSEMENT on HMAJGEN ltr EG-1-PAS:beb all (2597) of 6 Nov 1953

From: Chief, Bureau of Aeronautics
To: Secretary of the Navy
Via: (1) Chief, Bureau of Medicine and Surgery
(2) Chief of Naval Personnel

Subj: Experimental studies of a medical nature involving persons in
the Naval Establishment

1. Forwarded.

2. The Chief of the Bureau of Aeronautics recommends approval of the
request stated in the basic letter.

J. E. SULLIVAN
By direction

NAVAL AIR MATERIAL CENTER

PHILADELPHIA 12, PA.

IN REPLY REFER TO:

0-1-743:beb

11
(2597)

5 - 1953

From: Commander, Naval Air Material Center

To: Secretary of the Navy

Via: (1) Chief, Bureau of Aeronautics
(2) Chief, Bureau of Medicine and Surgery
(3) Chief of Naval Personnel

Subj: Experimental studies of a medical nature involving persons in the Naval Establishment

Ref: (a) Article 1-17, Manual of the Medical Department

Encl: (1) BUAME ltr Ser-40-511, 50841 of 14 Apr 1953
(2) Basic project outline for enclosure (1)

1. In accordance with reference (a), approval is requested to allow for full utilization of volunteers from the Naval Establishment to meet requirements of enclosure (1).
2. As required by reference (a) the experimental design proposed for these studies is submitted as enclosure (2).
3. As appropriate physical examinations will be conducted prior to the experiment and immediately afterwards. All pertinent information will be recorded as outlined in paragraph (3) of reference (a).

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

Ver-1E-511

50841
14 April 1953

From: Chief, Bureau of Aeronautics
To: Commander, Naval Air Material Center

Subj: Project TED No. NAM 1E 5114, Firewel Company Inc. Oxygen
Regulator; test and evaluation of

Encl: (1) Firewel Final Engineering Report, Contract No. (s) 51-517f

1. Priority: "C" Project Classification: UNCL UNCLASSIFIED
2. Costs are Chargeable To: Allotment E, Bureau Control No. 51260.
3. Desired Completion Date: 1 July 1953.
4. Operational Objective or Requirement: To reduce the weight, simplify the installation, decrease maintenance requirements and increase aircraft mobility superior to the present oxygen system. This to be accomplished by the installation of an oxygen regulator of the demand type equipped with automatic pressure-breathing assembly so designed as to be integrated into an oxygen mask being designed to receive this regulator, but also adaptable to the existing A-134 oxygen mask.
5. Abstract of Project: It is requested that tests be conducted to determine the performance characteristics of the Firewel Oxygen Regulator submitted under contract No. (s) 51-517-f. The regulator shall be operated at an inlet pressure of 50 psi. The basic performance characteristics of the regulator which are to be bettered, if possible, are a limiting flow of at least 150 liters per minute NTP with operating suction not to exceed 2 inches of water suction in the mask for all flows up to 100 liters per minute and not more than 6 inches of water suction for flows up to 150 liters per minute at all altitudes up to the altitude at which automatic pressure begins. The pressure breathing shall be as follows:

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ENCLOSURE (1)

er-48-511
50841

Subj: Project TED No. WAM 48 5114, Firewel Company Inc. Oxygen
Regulator; test and evaluation of

Pressure Breathing Inches of Water Not Less Than	By	Pressure Altitude In Feet But Not Later Than
2"	35,000	40,200
4"	37,000	41,000
6"	39,000	41,500
8"	41,000	42,500
10"		43,000

The pressure drop at 100 liters per minute flow shall not be more than 1.0 inch of water.

Exhalation pressure shall not exceed 1.0 inch of water above the mask pressure for flows up to 50 liters per minute and 3.0 inches of water above mask pressure for a flow of 100 liters per minute. The demand valve leakage shall not exceed 0.1 liters per minute at zero differential pressure nor shall more than 1.0 inch of water pressure be required to seal the demand valve to a leakage of less than 10 cc per minute.

The regulator shall operate as specified in the temperature range of -55°C to $+70^{\circ}\text{C}$.

6. Comizant Engineer: Lt. W. W. Alldredge, 48-511, Airborne Equipment Division, Room 1749, Extension 61376.

7. Source of Equipment: Forwarded by the Bureau of Aeronautics.

8. Disposal of Equipment: When tests are completed and equipment is no longer required it is to be returned to the Bureau of Aeronautics.

9. Number of Reports Required (Final): Nineteen (19).

J. Y. LICHTEN ALNER
y direction

EP

ENCLOSURE (1)

OUTLINE OF PROPOSED PROCEDURES FOR STUDYING PERFORMANCE CHARACTERISTICS
OF FIREWEL OXYGEN PRESSURE DEMAND BREATHING REGULATOR

1. Volunteer subjects will be exposed to simulated altitudes of 43,000 feet under the following conditions.
 - a. At normal temperature
 - b. Auxiliary standard breathing system will be provided for emergency use.
 - c. Medical observer will be present.
 - d. While so protected the volunteer subjects will be equipped with the Firewel oxygen regulator system. Subjects will provide subjective data pertaining to the adequacy of the system.
 - e. Volunteer subjects will be in constant radio communication with the controlling project engineer.
2. Previous tests have indicated that there is little danger of injury in these tests and all possible precautions will be observed.
3. The subjects will include both military and civilian volunteers.

Enclosure (2)

Office Memorandum • UNITED STATES GOVERNMENT

TO : Secretary of the Navy

DATE: 11 Dec 1953

FROM : Chief of Naval Personnel

SUBJECT: Experimental Studies of a Medical Nature Involving Persons in the Naval Establishment

1. The Commander, Naval Air Material Center, requests authorization to utilize military and civilian volunteers from the Naval Establishment in tests of an experimental nature involving anti-exposure equipment, flight clothing, oxygen regulator, and oxygen warning indicator for use by aeronautical personnel.
2. Precedent exists for this type of request. Approval has been given in the past provided the Chief, Bureau of Medicine and Surgery, certified that in his opinion physical harm or injury would not result to volunteers, and the Chief of Naval Personnel also approved the request.
3. No authority exists for extra-hazardous incentive pay and this is so stated.

Tech Asst: Recommend signature. GA
Very respectfully,

Naval Asst:

U.S. N.

W. H. Deere