

ECT

OPERATIONAL REQUIREMENTS

ATOMIC, BIOLOGICAL AND CHEMICAL WARFARE

- FIXED RADIOACTIVE FALLOUT WARNING DEVICE

CLOSED

CROSS REFERENCES

FILE NO.	SUBJECT

**"B. F." - DO NOT HOLD - THIS FILE WHEN
LAPSES IN ACTION MAY EXCEED 48 HOURS**

S981-117 (TD7134 (DGDO))

FILE REF

R C A F

M I N U T E S H E E T

REFERRED TO: COR

ATTN: F/L WHITEHEAD

MINUTE 1

1 DGDO concurs with the second draft of
 OCH 17 - 6/57

28 May 57

Jack C Bentley
(J C Bentley) Maj/USAF
DGDO/GDO 3
(6-8228)

10 7134

Referral	Cops
MAY	14 1957
File	S981-117
Chg & to	

S981-117 (COR)


MEMORANDUM

13 May 57

~~COps~~
COps

Operational Characteristic Fixed Radioactive
Fallout Warning Device OCH 17-6/57

1 The attached second draft of the a/n OCH
is passed for your comments.


(N.S.A. Anderson) G/C
Acting COR
(2-2843)

OCH 17-6/57
File S981-117 (D/MR)
Date 8 May 57

OPERATIONAL CHARACTERISTIC

FIXED RADIOACTIVE FALLOUT WARNING DEVICE

Second Draft

INTRODUCTION

1 In order to plan air and ground operations, all commanders must know immediately when their stations are being subjected to the effects of radioactive fallout from the detonation of nuclear weapons. It is necessary that some device be installed at units to provide this information.

REQUIREMENT

2 The RCAF requires a fixed radioactive fallout warning device.

OPERATIONAL FUNCTION

3 The primary role of such a device will be the automatic detection of the radioactive fallout and initiation of a signal system whereby the presence and intensity of the contamination is made known. In view of thermonuclear weapon weapons, an air base might be grossly contaminated to such a degree that all personnel would be casualties within three hours after fallout began, if the fallout went undetected. This device will afford the commander a means of determining the beginning of such fallout, its intensity and will allow him to take adequate safety measures and thus reduce casualties to a minimum. He will also be able to report the contamination of his base, and thus prevent operational commitments of clean aircraft to his base.

DETAILED CHARACTERISTICS

4 Physical

- (a) The device may consist of four components: a detection unit, an electronic circuitry unit, an alarm signal unit and a recorder unit.
- (b) The device is to be as compact and as light as practical without a sacrifice of accuracy and efficiency.
- (c) The total weight of all units should not exceed 200 lbs including packaging and spares.
- (d) Notwithstanding sub-para (b) above, the physical design of all units of the device should be such that decontamination is easily effected.

Operational

- (a) Detector Unit: The ^{re} detection unit may be of the ion chamber, GM tube or scintillometer type and must have the following specifications:
- (i) It must detect gamma radiation of the energy level commonly associated with fission products of nuclear detonations.
 - (ii) It must detect gamma radiation from 0 to 1000 r/hr.
 - (iii) It must be capable of being connected to the electronic circuitry and alarm unit by a cable of not less than 100 feet with no resultant loss in accuracy or efficiency.
- (b) Electronic Circuitry Unit: The electronic circuitry unit will contain the necessary circuiting to provide a reading in r/hr on a meter scaled from 0 to 1000 r/hr. The scale of this meter will be of logarithmic design and will be a single scale. The physical size of this scale will be no less than four (4) inches. The following specifications will also be provided:-
- (i) An outlet will be provided for the attachment of a recording device to provide a chronological record of intensities of radiation.
 - (ii) An outlet will be provided so that suitable alarm devices will be activated upon receipt of a certain level of radiation at the detector unit.
 - (iii) The level of radiation at which the alarm is activated will be variable, preferably by a rheostat-type of switch, from 1r/hr to 100 r/hr. If a variable type switch is not feasible, then provisions must be made so that the alarm may be easily and simply set at levels of 1, 5, 10, 50, and 100 r/hr.
- (c) The Alarm Signal Unit: This unit will be designed to give both an audible and visual signal once a predetermined level of radiation has been exceeded at the detector unit location and passed through the electronic circuiting unit. It will also activate the recorder unit as soon as the alarm is activated.
- (d) The Recorder Unit: This unit may be of commercial design and will provide continuous 24 hour record of radiation intensities once set in action by the alarm Signal Unit.

- 3 -

6 Environmental Conditions

The detector unit and cable leads are the only parts of this device that will be subjected to rigorous weather conditions. They will be capable of satisfactory operations where continuously exposed to any type weather conditions which may be encountered.

7 Power Supply

- (a) The entire device is to be designed to operate from 110 Volt, 60 cycle power. A power kit will be provided containing necessary transformers and male plugs to allow use of 220 V power and power sources in foreign countries.
- (b) It is desirable that the entire device be capable of operating from 12 V DC motor vehicle batteries as a secondary power supply.
- (c) All fittings, tube sockets, cannon plugs, and receptacles are to be made of standard commercial design, and all components should be in common use.
- (d) Required components or parts not in common use must be available in Canada.

8 Accuracy

The detector and meter assembly must read accurately within $\pm 10\%$ over the 10-1000 r/hr portion of the scale, and within $\pm 20\%$ over the 1-10 r/hr portion of the scale.

9 Transportation

- (a) It is desirable that the entire device be capable of transport by jeep or small vehicle.
- (b) Packaging of the device must be designed to permit transportation by land, sea or air and to withstand a reasonable amount of rough handling.
- (c) Packaging should be designed so that no individual package will weigh more than 75 lbs.

SPECIAL FEATURES

10 Since weight is not a limiting factor for this item, it is desired that as much reliability as possible be built into it. In any case, it should not require servicing more often than every 30 days. Provisions should be made to provide a method of test and calibration as an integral part of the Detector Unit. If a radioactive source is used, it should be of long-half-life in order that noticeable changes in the test conditions are not evident in a short period of time. If possible, this test method should provide two test and calibration readings, one in the 1-10 r/hr range and one in the 10-1000 r/hr range.

/4

- 4 -

Confidential

MAINTENANCE & SERVICING

- 11 (a) Maintenance and servicing tasks should be a minimum and should be compatible with the skills of present RCAF tradesmen.
- (b) Repair and replacement of parts shall require no special tools.

AVAILABILITY

- 12 As soon as possible.

MAIN FILE No. 981-117

T.D. No. 7134

7134

DEPARTMENT OF NATIONAL DEFENCE

ANNALS

TEMPORARY DOCKET

T.D. No.

MAIN FILE NUMBER.

[illegible]

INSTRUCTIONS

1. Temporary Dockets are to deal WITH ONE CASE ONLY.
2. T.D.'s NOT to be placed on main file UNLESS Central Registry informed by means of Form C.R. 112.
3. T.D. No. together with main file number to be quoted on all correspondence originated.
4. T.D.'s not to be passed from one service to another.
5. Action should be taken as soon as possible in order that main file may be kept up to date. If action cannot be taken within 48 hrs., B.F. Docket.
6. T.D.'s to be requisitioned, passed, B.F.'d, etc., in the same manner as main files by means of Form C.R. 112.

MAIN FILE No. 1921-117-4 T.D. No. 71344

CONFIDENTIAL

TEMPORARY DOCKET
DEPARTMENT OF NATIONAL DEFENCE
ROYAL CANADIAN AIR FORCE

Don't

MAIN FILE NUMBER

[illegible]

INSTRUCTIONS

1. Temporary Dockets are to deal WITH ONE CASE ONLY.
2. T.D's. NOT to be placed on main file UNLESS Central Registry informed.
3. T.D. No. together with main file number to be quoted on all correspondence originated.
4. T.D's. not to be passed from one service to another.
5. Action should be taken as soon as possible in order that main file may be kept up to date. If action cannot be taken within 48 hrs. B.F. Docket.
6. T.D's. to be passed, P.A'd, B.F'd, etc. in the same manner as main files.

17-6

Confidential

SECURITY CLASSIFICATION:

DARME MINUTE SHEET

Date: 21 Jun 57

Ref File: 5981-117

Vol. No: _____ TD# 7134A

Minute (3)

D. Brown E
(Addressee)


Concur in OCH 17-6/57 second draft in its present content. ✓

It is requested this OCH be passed to COL through CAE to incorporate any comments from COps and return for forwarding to the Atomic panel and ISWC for consideration.

With regard to min(2). It is considered that no action should be taken at this time to prepare estimates until it is decided whether or not this is a tri service item or solely an RCAF item requirement.

John R
4 June 57

000270

 Anne E.

Any comment?

22 May

G. G. TRUSCOT⁰⁰⁰²⁷¹

S981-117 (COR) TD 7134A

M E M O R A N D U M

13 May 57

CAE

~~60ps~~

(1)

Operational Characteristic Fixed Radioactive
Fallout Warning Device OCH 17-6/57

1 The attached second draft of the a/n OCH
is passed for your comments.

(2)

Annex 4.
Will you prepare comments
- please for Director. You
should also quickly prepare
a preliminary estimate for
1958/59 to support this requirement
and get it to CMC/Co. and.

*J. Buchanan
D. H. E.
24 May 57.*

[Signature]
(N.S.A. Anderson) G/C
Acting COR
(2-2843)

(4) *ck*
Att. Attached draft forwarded
to Atomic Panel for consideration as
replacement for the present automatic
alarm. Meeting to be held on 12 Aug 57
[Signature]
Annex 4-2-4
12 Aug 57.

Confidential

OCH 17-6/57
File S981-117 (DATR)
Date 8 May 57

OPERATIONAL CHARACTERISTIC

FIXED RADIOACTIVE FALLOUT WARNING DEVICE

Second Draft

INTRODUCTION

1 In order to plan air and ground operations, all commanders must know immediately when their stations are being subjected to the effects of radioactive fallout from the detonation of nuclear weapons. It is necessary that some device be installed at units to provide this information.

REQUIREMENT

2 The RCAF requires a fixed radioactive fallout warning device.

OPERATIONAL FUNCTION

3 The primary role of such a device will be the automatic detection of the radioactive fallout and initiation of a signal system whereby the presence and intensity of the contamination is made known. In view of thermonuclear megaton weapons, an air base might be grossly contaminated to such a degree that all personnel would be casualties within three hours after fallout began, if the fallout went undetected. This device will afford the commander a means of determining the beginning of such fallout, its intensity and will allow him to take adequate safety measures and thus reduce casualties to a minimum. He will also be able to report the contamination of his base, and thus prevent operational commitments of clean aircraft to his base.

DETAILED CHARACTERISTICS

4 Physical

- (a) The device may consist of four components: a detection unit, an electronic circuitry unit, an alarm signal unit and a recorder unit.
- (b) The device is to be as compact and as light as practical without a sacrifice of accuracy and efficiency.
- (c) The total weight of all units should not exceed 200 lbs including packaging and spares.
- (d) Notwithstanding sub-para (b) above, the physical design of all units of the device should be such that decontamination is easily effected.

Confidential

5

Operational

- (a) Detector Unit: The ^{te} detection unit may be of the ion chamber, GM tube or scintillometer type and must have the following specifications:
- (i) It must detect gamma radiation of the energy level commonly associated with fission products of nuclear detonations.
 - (ii) It must detect gamma radiation from 0 to 1000 r/hr.
 - (iii) It must be capable of being connected to the electronic circuitry and alarm unit by a cable of not less than 100 feet with no resultant loss in accuracy or efficiency.
- (b) Electronic Circuitry Unit: The electronic circuitry unit will contain the necessary circuiting to provide a reading in r/hr on a meter scaled from 0 to 1000 r/hr. The scale of this meter will be of logarithmic design and will be a single scale. The physical size of this scale will be no less than four (4) inches. The following specifications will also be provided:-
- (i) An outlet will be provided for the attachment of a recording device to provide a chronological record of intensities of radiation.
 - (ii) An outlet will be provided so that suitable alarm devices will be activated upon receipt of a certain level of radiation at the detector unit.
 - (iii) The level of radiation at which the alarm is activated will be variable, preferably by a rheostat-type of switch, from 1r/hr to 100 r/hr. If a variable type switch is not feasible, then provisions must be made so that the alarm may be easily and simply set at levels of 1, 5, 10, 50, and 100 r/hr.
- (c) The Alarm Signal Unit: This unit will be designed to give both an audible and visual signal once a predetermined level of radiation has been exceeded at the detector unit location and passed through the electronic circuiting unit. It will also activate the recorder unit as soon as the alarm is activated.
- (d) The Recorder Unit: This unit may be of commercial design and will provide continuous 24 hour record of radiation intensities once set in action by the alarm Signal Unit.

/3

Confidential

6 Environmental Conditions

The detector unit and cable leads are the only parts of this device that will be subjected to rigorous weather conditions. They will be capable of satisfactory operations where continuously exposed to any type weather conditions which may be encountered.

7 Power Supply

- (a) The entire device is to be designed to operate from 110 Volt, 60 cycle power. A power kit will be provided containing necessary transformers and male plugs to allow use of 220 V power and power sources in foreign countries.
- (b) It is desirable that the entire device be capable of operating from 12 V DC motor vehicle batteries as a secondary power supply.
- (c) All fittings, tube sockets, cannon plugs, and receptacles are to be made of standard commercial design, and all components should be in common use.
- (d) Required components or parts not in common use must be available in Canada.

8 Accuracy

The detector and meter assembly must read accurately within $\pm 10\%$ over the 10-1000 r/hr portion of the scale, and within $\pm 20\%$ over the 1-10 r/hr portion of the scale.

9 Transportation

- (a) It is desirable that the entire device be capable of transport by jeep or small vehicle.
- (b) Packaging of the device must be designed to permit transportation by land, sea or air and to withstand a reasonable amount of rough handling.
- (c) Packaging should be designed so that no individual package will weigh more than 75 lbs.

SPECIAL FEATURES

10 Since weight is not a limiting factor for this item, it is desired that as much reliability as possible be built into it. In any case, it should not require servicing more often than every 30 days. Provisions should be made to provide a method of test and calibration as an integral part of the Detector Unit. If a radioactive source is used, it should be of long-half-life in order that noticeable changes in the test conditions are not evident in a short period of time. If possible, this test method should provide two test and calibration readings, one in the 1-10 r/hr range and one in the 10-1000 r/hr range.

~~Confidential~~

MAINTENANCE & SERVICING

- 11 (a) Maintenance and servicing tasks should be a minimum and should be compatible with the skills of present RCAF tradesmen.
- (b) Repair and replacement of parts shall require no special tools.

AVAILABILITY

- 12 As soon as possible.

981-17

T.D. No.

7134 A

DEPARTMENT OF NATIONAL DEFENCE

44-38861-1033

TEMPORARY DOCKET

T.D. No.

MAIN FILE NUMBER

13/5/57

[illegible]

INSTRUCTIONS

1. Temporary Dockets are to deal WITH ONE CASE ONLY.
2. T.D.'s NOT to be placed on main file UNLESS Central Registry informed by means of Form C.R. 112.
3. T.D. No. together with main file number to be quoted on all correspondence originated.
4. T.D.'s not to be passed from one service to another.
5. Action should be taken as soon as possible in order that main file may be kept up to date. If action cannot be taken within 48 hrs., B.F. Docket.
6. T.D.'s to be requisitioned, passed, B.F.'d, etc., in the same manner as main files by means of Form C.R. 112.