SECRET

R.A.F. Form 2008

PART I

FOR REGISTRY USE ONLY

AIR MINISTRY
OR
ROYAL AIR FORCE 1982

Registered Number C 151715/62 PART I

Date Opened 2 JUL 1962

UNIT OR BRANCH (For R.A.F. use only)

AIR 2/14786

SUBJECT

RADIATION - PERSONNEL MEDICAL EXAMINATION & RECORDING OF TOTAL DOSE.

(RE-REG. FROM 895564/54 PART I)

THIS FILE MUST BE CIRCULATED UNDER COVER AND KEPT UNDER LOCK AND KEY WHEN NOT IN USE, OR IN THE EVENT OF THE ROOM BEING LEFT UNATTENDED.

For numbers and subjects of former and subsequent papers see inside cover.

INSPECTION PERMITTED UNDER s 5(4)

CLOSED UNTIL 2040

SAFE Vacated ROOM

Referred to	Date	Min. or Encl.	Referred to	Date	Min. or Encl.	Referred to	Date	Min. or Encl.	Referred to	Date	Min. or Encl.
H.P	2 JUL 1962		C.S.P.I	2 2 84							

CLOSED ... PLACED ... THIS FILE PART

H.P. 2/7/62 Top Encl.

D.S.H.R.(RAF) 3/3/65

Secretary 5/3/65

PA

A.4. 17/8/70

DATE FOR 1982

(a) SECOND REVIEW

(b) ~~DESTRUCTION~~

Nov

REVIEWED ...

BY .....

DRO(ATR)MOD

WARNING: The contents of this cover are subject to the Public Records Act, 1958, and may be disposed of only in accordance with the instructions contained in Q.R. 2068 or the Air Ministry Office Manual.

NOTE: If the contents of this File become non-secret the File should be returned to Registry for transference to the appropriate series of Registered Files.

P.A. ACTION

(Form 5659 must be used, and the officer who completes it must sign hereunder).

SECRET

MINUTE SHEET — Air Ministry File No. C. 95567/57

1

20/6/57 L. from RAAF HQ re recording radiation doses - 1AB

2

MA2.

Reference our previous minute regarding radiation dose recording you might like to consider these Australian forms at your meeting. They are at least worth a mention – well constructed & with all the relevant data. I will reply to the RAAF after your meeting when we should have some more advanced information. Would you be good enough to put me in the picture when you return.

M. B4.
24 Jun 57

3

25/6/57 L. to AWRE re recds rad. dosage RAF personnel – 3A

4.

25/6/57 L to Newbury AWRE re rad. dosage RAF personnel – 4A

5.

8/7/57 L to RAAF HQ reply to 1A – 5A

6.

23/7/57 L from AWRE reply to 4A – 6A

7.

14/8/57 L. from Lb.Cdr Dagg with Lists A & B. Grapple 1957 – 7A

8

13/9/57 L from RAAF HQ further to 5A – 8A

9.

MA2.

Please see Encl 8A. Has there been any further development?

MB4
20 Sep 57

10

30/8/57 S. from ATG Antler re officers banned from sampling operations – 10A

11

19/9/57 S 1188 to Manchuria – ——— 11A

H90638 Wt.63778-BM.4320 200M 1/57 Gp.84

12A.

26.8.57. Minutes of 6th meeting of J.S. Working Party — 12A
on Medical Documentation.

13.

M.A. 4 Ref. M.9. St - E12A I have attached a copy of the Minutes of the meeting you attended on 8. Aug. 57. I have heard nothing further relevant to item 43/57 of the Minutes.

M.A. 2
23 Sept. 57

Sqn. Ldr.

14

16A.

30 Sep 57 L to AOC. RAAF. ref 5A,

15

17/11/57 L from AERE forwarding list of personnel + rad. dosage. — 15A

16

10/57 L to TSL re radiation dosages — 16A

17

17 10/57 Lm from AD Ops AWT forwarding W.O. letter re postings to Maralinga 17A

18

30 10/57 Lm to MDI + P. Pol 3a re blood exam Maralinga personnel 18A

19.

31 10/57 L m from Air Eng 4b re. max dosage radiation 19A

20

30 10/57 Lm from GD5a re Radio active Sources — regulations — 20A

21

31 10/57 L to Cds re blood exam postings to Maralinga — 21A

22

31 10/57 Lm to Air Eng 4b re R/A materials — regulations — 22A

23

31 10/57 Lm to Branches forwarding dosage Amo — 23A-B

24

31 10/57 Lm to Ops AWT reply to 17A — 24A

25

11 10/57 S. 7789 to Yuma Island requesting reply to 11A — 25A

26

4 11/57 Ltr from MoD1 replying to 18A — 26A

27

5 11/57 Ltr from Ops AWT replying to 24A — 27A

28

5 11/57 L to Wyntroc forwarding drops Amo — 28A

29

5 11/57 drops Amo re results of workers with R/A substances — 29A

30

8 11/57 Ltr to ATF Grapple re med exams — 30A

31

8 11/57 Ltr from Air Mag 46 re 23A — 31A

32

12 11/57 Ltr to Cranwell re drops Amo + meeting to discuss — 32A

33

12 11/57 Ltr from DDP(POL) re med exams Officers — 33AB

34

11/57 Ltr from Hyp Station replying to 28A — 34AB

35

11 11/57 L to Dr Wyntroc re med exams + blood tests — 35A

36

14 11/57 L to Weston. Hyp. requesting info — 36A

37

15 11/57 L from West. Hyp. replying to 36A. — 37A

38

18 11/57 Ltr from E18 replying to 23A — 38A

39

18 11/57 Ltr from E18 replying to 32A — 39A

40

18 11/57 Ltr from ADPS(PM) replying to 32A — 40A

41

20 11/57 L to Dr Wilson Weston. Hyp. replying to 37A. — 41A

42

20 11/57 L to BC forwarding lists of personnel — 42AB

H90638 Wt.63778-BM.4320 200M 1/57 Gp.840 F. & C. Ltd

43

20"/57 Lm to HQ Rear ATE Graphs re personnel — 43A

44

20"/57 Lm from MA2 replg to 32A — 44A

45

18"/57 L from HQ HC replg to 21A — 45A

46

20"/57 Lm from Air Eng 46 replg to 32A — 46A

47

25"/57 L to Cdo replacing E21A - re blood cocaine personnel to Manalinga — 47A

48

22"/57 Lm from Air Eng 46 replg to 32A — 48A

49

25"/57 memo to Rad Eng 9 forwarding draft Amo — 49A

50

22"/57 Lm from MA2 replg to 33A — 50A

51

Enclosures 51A to 52A transferred from B/F A176987

53

27"/57 L to HQ HC replg to 45A — 53A

54

Enclosures 54A to 64A transferred from A/169726

65

19"/57 L from AWRE list of personnel + dosage — 65A

66

29"/57 L to J. Rundo AERE re rad. dosage JMO — 66A

67

29"/57 Lm to D H+R re rad. dosage Atomic Trials — 67A

68

29"/57 Lm from Eng Plans 1 re draft Amo — 68A

69

Draft Op. Planning Instr. Nuclear Rad. Hazards - Permissible doses for Nuclear personnel — 69A

70

4"/57 L from HQ BC forwarding list of personnel — 70A

71

29"/57 Lm to D of H·R re rad. dosages. — 71A

72

10"/57 L. to A/Cdre Wilson CMF re rad. dosages. — 72A

MINUTE SHEET

C.95567.
Air Ministry File No.

73

12/12/57 L to AWRE re Met. Rad. dose rates — 73AB

74

12/12/57 L from A/Cdre Wilson CBE. reply to 72A — 74A

75

13/12/57 Lon to DDMtoR re 74A — 75A

76

Note of Action by JMU 76A

77

Nominal roll of Regt personnel selected for Antler — 77A

78

29/11/57 L from AWRE forwarding rad. exposure dosages Antler personnel 78A-B

79

19/12/57 Lon from Air Leg O reply to 43A — 79A

80

23/12/57 L to Record Office forwarding AF A.21 — 80A

81

20/12/57 L from AERE reply to 73A — 81A

82

6/1/58 L.M. from Task Force Grapple — medical examination details — 82A

83

10/1/58 L to AWRE re 82A — 83A

84

3/1/58 Memo from Army Leg 2 re field photography — 84A

85

14/1/58 L from Shirrock forwarding No 1 Gp letter re rad. dosage — 85ABC

86.

16/1/58 L to Shirrock reply to 85A — 86A

87

Draft Advice - Health Control of workers [illegible] R/A material 87A
Transferred to R16

88

16/1/58 Letter to Stanmore Whitehouse forwarding draft Advice — 88AB
Transferred to R16.

H90638 Wt.63778-BM.4320 200M 1/57 Gp.840 P. & C. Ltd.

17/1/58 L to G/C Ross re 85 A — 89A

89

17/1/58 L to AVM Hill re blood exams — 90A

90

20/1/58 L to A/Cdre Wilson forwarding list of Antler dosages — 91A

91

27/1/58 L from Melksham re med exams C/F Martin — 92A

92

30/1/58 Lm from OS26 re AFS A20 & 21 — 93A

93

5.2.58 L. TO AVM Daley — 94A

94

95

5/2/58 L. from AWRE re integr. rad. dosages — 95A

96

6/2/58 L from Melksham re C/F Martin — 96A

97

10/2/58 L from Reasf. Welch re urine testing etc — 97A

98

13/2/58 L to Reasf. Welch reply to 97A — 98A

99

19/2/58 L from Reasf. Welch reply to 98A — 99A

100

16/2/58 Lm from DofPA reply to 82A — 100A

101

25/2/58 L to R. Welch — 101A

102

26/2/58 L.M. from DdP(G) re Enc. 82A — 102A

103

28/2/58 Lm from TF Sweeting

104

17.3.58 L. from AVM. Daley in reply to 94A — 104A

105

20.2.58 L. from AVM Daley — 105A

106

31.3.58 L TO AVM. Daley — 106A

107

2.4.58 Memo re Xmas Christmas Island with forms — 107A

MINUTE SHEET — Air Ministry File No.

108

24.3.58 L.M. from Task Force Capple — 108A

109

8.4.58 Memo. to Record office Plans — 109A

110

23.4.58 L. from RPS Sutton with forms — 110A

111

23.4.58 L.M. to MA3 for payment of fees — 111A

112

12 5/58 Memo to MA7 + APF5 re AF. A20 + 21 — 112A

113

23 5/58 S. P. 139 from 76 Sqdn re F/L Spatches — 113A

114

24 5/58. S. P.140 from 76 Sqdn re radiation dosages — 114A

115

27 5/58 S. P.141 from HQ BC re F/L Spatches — 115A

116.

2 5/58 L. from AWRE re radiation does — 116A

117.

29 5/58 S. MS060 from AWRE re rad. dosages — 117A

118

4 6/58 L from AWRE re radiation dosages — 118A

119

3/7/58 L to A/Cdr Shannon re suggested blood count for Christmas Island — 119A

120

3/7/58 L to A/Cdr DA Wilson will copy of 119A for commodel — 120A

121

22/8/58 Memo. from Radio Introduction Unit RRE will attached papers — 121A

122

28/8/58 L from RPS. Sutton re excessive dosage Aden — 122A

123

27/8/58 ~~L.M. from Rod. Eng. 9~~ enclosing App. E to R.I.U Report — 123A

Transferred to C 99755/57

(6929) Wt. 35903—BM4058 300m 7/57 A.O.St.

126 transferred to C.9975 5/57

1/9/58 L.M. to Rad Safety Off re reply to Ltr. 123A — 126A

125

3/9/58 Reply To Pmo BFPO 69 Ref Enclosure 122A 125A

126

23/9/58 Phys letter on Radiological Safety Precautions at Xmas Is — 126A

127

24/9/58 L from Staff re 126A — 127A

128

25/9/58 HQTC l re Encl 126A — 128A

129

26/9/58 MA 2 memo re Xmas Isle postings - civilians ref AMF 1928 & F Med 12 of MR Kingston. — 129A

130

3/10/58 L. to HQ HC re ~~reply~~ prec. Xmas Island — 130A

~~130~~

131

3/10/58 L to AOC in C HC further to 126A — 131A

132

13/10/58 L to Cds etc amending 126A — 132A

133

List of radiation dosages Grapple personnel 133A

134

27/10/58 L from TF Grapple re med exam of personnel — 134A

135

24/11/58 L from 14 Sqn. re med. exam personnel — 135A

136

5/12/58 L to 14 Sqn. reply to 135A — 136A

137

5/12/58 L to HQ MC forwarding Comments 135A & 136A — 137A

138

12/1/58 L from W.O re discussion on medical exam. policy 138A

139

16/1/59 L to W.O. reply to 138A — 139A

140

15/1/58 L to G/C Howell BTSM re blood exam — 140A

MINUTE SHEET — Air Ministry File No.

141

30/1/59 L. to A/Cdre Stamm advising — 141A
Cocked for comment
"The Total Fencocyte Count" AWRE

142

4/2/59 L. from A/Cdre Stamm in reply to 141A — 142A

143

16/2/59 L from Wo. (AMD8) re rad. protection — 143A

144

17/2/59 L to AMD8 (WO) re rad. protection — 144A

145

17/2/59 L to A/Cdre Stamm re rad. protection — 145A

146

23/2/59 L to AMD8 reply to 143a — 146A

147

19/3/59 L from Surg Cdr Ellis - admiralty. further to 143A dtd — 147A

148

26/4/59. L from SMO St Mawgan forwarding FMed 447 to 144 Cpl Kent. with queries. — 148A

149

6.5.59 L To St. Mawgan returning FMed 4.7 Cpl Kent — 149A

150

CLOSED
NO FURTHER MINUTES OR ENCLOSURES MUST BE PLACED IN THIS FILE

Support H agreed.
1/7/59

(6929) Wt. 35903—BM4058 300m 7/57 A.O.St.

Enclosures

6 A B C D 7 A B C 15 A B C

65 A 70 A B 71 A B 72 A 73 A B

77 A 78 A 81 A 95 A

108 A 109 A B 114 A 116 A 117 A

118 A 122 A 133 A

Transferred to

B/E R 15

Radiation Medical Effects of

Including records of

Dosages received

MEMORANDUM

R.A.F. Form

...y M.A.4. ...ole Square, ...don, W.C.1.	TO Senior Medical Officer R.A.F. St. Mawgan. Copy to: P.M.O. Coastal Cd.
Extn. BUS. 5040 327	Our ref. £.95567/59/MAS Date 6th May 1959
	Your ref. SM/7427/1/MED. Dated 22nd April 1959

SUBJECT: 5931944 Corporal KENT. B.S. - SUPP. I. USA

1. Form Med 4 in respect of the above-named is returned herewith: Group Captain Muir (M.A.5) states that he does not require further medical examination.

2. It should be noted that on receipt in this Branch, Enclosure No 4, Form 4061, Dental Record Card was missing from the F Med 4.

Signature of Sender: D.M.Horne
Name in Block Letters: D.M.HORNE
Rank/Appointment: W/O M.A.4

NOTES
1.—Continue overleaf if necessary, annotating "P.T.O.".
2.—This form is normally to be completed in manuscript.

390 25/BJ/20. Wt. 39025. 100M Pads. B.& S. 51-8501.

4/5.

(W.B.KENNEDY)
Squadron Leader
Senior Medical O
Royal Air Force,

Air Ministry M.A.4.

1484

M/7427/1/Med.

Royal Air Force,
St. Mawgan,
Newquay,
Cornwall.

22 April, 1959

Sir,

593194 Cpl. Kent, B.S. - Supp. I
Royal Air Force, St. Mawgan

I have the honour to refer to the case of the above named airman who has been selected for posting to R.A.F. Christmas Island.

2. A blood count was carried out on 16. 4. 59. in accordance with A.M.O. A.129/58 and Air Ministry letter C.95567/57/M.A4 dated 13th October, 1958. It is noted from the report of the blood count that both the Total White Cell Count and the Neutrophil Count are below the warning level as indicated in the A.M.O.

3. It has been recommended by Headquarters Coastal Command that the case be reported to Air Ministry M.A4 before rejecting the airman for service in Christmas Island. Form Med. 4 and a copy of the Blood Count report are enclosed.

I have the honour to be,

Sir,

Your obedient Servant,

BF
4/5.

(W.B.KENNEDY)
Squadron Leader
Senior Medical Officer
Royal Air Force, St.Mawgan

Air Ministry M.A.4,
2/8, Richmond Terrace,
London. S.W.1.

149A.

Copy to:- ~~P.M.O. Headquarters Coastal~~ Command.

Phoned CMSO (in Pmo's absence) Coastal Cd and asked him to check if this man is going into the Controlled area. His trade suggests that he would not. and does not therefore require med. exam. If he is then I have suggested a check blood count. HQCC. to refer in due course.

From: Surgeon Commander F. P. Ellis, O.B.E., Royal Navy,

Medical Department of the Navy,
(Admiralty),
Queen Anne's Mansions,
St. James's Park,
London, S.W. 1.

19th March, 1959.

Dear Lush,

As you requested, I have discussed the wording of the request from the three Medical Directors-General to the Medical Research Council which was transmitted by Admiral May to Sir Harold in his letter dated 31st December, 1958, (M.D.G. 3737/58/SSB) with Group Captain Muir of the Air Ministry and Lieutenant Colonel Whitcher of the War Office.

We are in agreement that the wording of the request as it was originally transmitted is too broad and that it is also inappropriate to ask the Council to advise on policy for the Services.

We therefore suggest that the request should be re-stated as follows:

"What are the medical examinations which can determine whether a member of the Armed Forces may prove unduly sensitive to ionising radiations?"

I hope this will provide a more satisfactory basis for discussion by the Nuclear Hazards (Military) Committee than the question posed previously. If you agree would you like the re-phrased question to be transmitted officially to Sir Harold, or will this letter provide you with all that you need.

Yours sincerely,

Dr. B.B. Lush,
Medical Research Council,
38 Old Queen Street,
Westminster, S.W.1.

Copies to
/Addressees over

286

CONFIDENTIAL

Lieutenant Colonel H. W. Whitcher, T.D.,M.A.,M.B.,R.A.M.C.,
A.D.G. - A.M.D.S.,
The War Office,

Copies to:- Group Captain A. Muir, Royal Air Force,
Directorate General Medical Services,
Air Ministry, (M.A. 5),
1-6 Tavistock Square,
London, W.C. 1.

Lieutenant Colonel H. Whitcher, R.A.M.C.,
The War Office A.M.D. (8),
Lansdowne House,
Berkeley Square,
London, W. 1.

F.R.C.P., D.C.P., D.T.M.& H. T.M.

13

146A

UAR

C.95567/57/M.A.5 ✓ 23rd February, 1959.

CONFIDENTIAL

The Under Secretary of State (A.M.D.8),
The War Office,
London, S.W.1.

143A

1. Re your 24/Misc/4258(AMD8) of 16th February, it is suggested that the question be as follows:

"Will the M.R.C. please advise on the physical examinations, particularly of the blood and chest, it considers valuable in screening personnel from ionising radiation encountered as (a) an occupational risk and as (b) an operational hazard such as unexpected fallout in field trials with atomic weapons."

2. This definition of our problem should assist the council in its deliberations, and enable the services to frame a policy that will be practicable in the conditions to which they are specially subject.

Adam Lewis Capt.
MA 5.

Copy to: Consultant in Pathology and Tropical Medicine,
Royal Air Force.

CONFIDENTIAL

Adam Lewis Capt.

C.95567/57/M.A.5 ✓ 23rd February, 1959.

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Adam Wm Surg. Capt.
MA 5.

Copy to: Consultant in Pathology and Tropical Medicine,
Royal Air Force.

CONFIDENTIAL

Adam W...

Lieutenant Colonel H. W. Whitcher, T.D., M.A., M.B., R.A.M.C.,
A.D.G. - A.M.D.8.,
The War Office,
S.W.1.

CONFIDENTIAL

F.R.C.P., D.C.P., D.T.M.& H.

C.95567/57/M.A.5

23rd February, 1959.

CONFIDENTIAL

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Adam Linn Sup. Capt
MA5.

Copy to: Consultant in Pathology and Tropical Medicine,
Royal Air Force.

CONFIDENTIAL

Yours

Adam Linn.

Lieutenant Colonel H. W. Whitcher, T.D.,M.A.,M.B.,R.A.M.C.,
A.D.G. - A.M.D.8.,

F.R.C.P., D.C.P., D.T.M.& H.

From: Group Captain A. Muir, M.A.,B.Sc.,M.B.,Ch.B.,M.R.C.P.(Edin),
D.T.M.& H.,R.A.F.

145A

Ref: C.95567/57

17th February, 1959.

CONFIDENTIAL

Dear Air Commodore,

I have now received the War Office proposal concerning the question to the M.R.C. about which I wrote to you last week. Here it is:

"Will the M.R.C. give advice concerning the physical examinations they consider valuable for service personnel who may be exposed to ionising radiations, with particular reference to blood counts and chest X-Rays."

2. The War Office suggests that this will give the M.R.C. a wide brief and they, in the course of their deliberations can determine

(a) What examinations can determine if a man is susceptible to ionising radiations

(b) Whether blood counts and chest X-Rays have any place in monitoring exposure to ionising radiations.

3. I hope you may find this information useful when giving me your opinion on the subject.

Yours Sincerely

Adam Muir.

Air Commodore W.P. Stamm, M.B.,B.S.,F.R.C.P.(London),D.C.P.,D.T.M.& H.
Consultant in Pathology and Tropical Medicine,
Institute of Pathology and Tropical Medicine,
R.A.F. Halton, Bucks.

Yours

Adam Muir.

Lieutenant Colonel H. W. Whitcher, T.D.,M.A.,M.B.,R.A.M.C.,
A.D.G. - A.M.D.8.,
The War Office,

F.R.C.P., D.C.P., D.T.M.& H.

1444

17th February, 1959.

Dear Harold,

Thank you for the letter on the joint service approach to the M.R.C.

Before sending you a formal reply I should like to get advice from our Consultant in Pathology, Air Commodore W.P. Stamm. You may remember he furnished an opinion on the value of blood examinations for monitoring exposure to radiation, when the subject was discussed last summer with the Commander of Task Force Grapple.

I shall be writing again in due course.

Yours ever

Adam Kuin

Lieutenant Colonel H.W. Whitcher,
A.D.G. - A.M.D.8,
The War Office,
S.W.1.

Yours ever

Adam Kuin.

D.C.P., D.T.M.& H.

143A

TEL. No. GROsvenor 8040
EXTN. 464

Further correspondence on this subject should be addressed to:
The Under-Secretary of State (AMD 8)
THE WAR OFFICE,
LONDON,
S.W.1.

Please quote in any reply:
24/Misc/4258 (AMD 8)

16 February, 1959.

Memorandum for:-

The Under Secretary of State,
The Air Ministry (MA5),
London.

Radiological Protection.

139A

Reference C 95567/57/MA5 dated 14th January, 1959.

1. It is considered by us that we should ask the MRC the following:

"Will the MRC give advice concerning the physical examinations they consider valuable for service personnel who may be exposed to ionising radiations, with particular reference to blood counts and chest X Rays."

2. This will give the MRC a wide brief and they, in the course of their deliberations can determine

(a) What examinations can determine if a man is susceptible to ionising radiations

(b) Whether blood counts and chest X Rays have any place in monitoring exposure to ionising radiations.

/3.

Yours ever

Adam Hill.

3. We consider a unified Service approach to the MRC should be made, and perhaps, in your reply, you would care to indicate specifically what you consider should be sought if you disagree with paragraph 1 above.

H. W. Whitaker
for Director-General, Lt-Col.
Army Medical Services.

SG

From: Air Commodore W.P. Stamm, M.B., B.S., F.R.C.P., D.C.P., D.T.M.& H.

R.A.F. INSTITUTE OF
PATHOLOGY AND TROPICAL MEDICINE
Halton, Aylesbury, Bucks.
Telephone: Wendover 2261 Ext. 120

1624

In any reply please quote: CP/62/1

Your reference:

4th February, 1959.

Dear Tommy.

Thank you for your letter dated 30th January, 1959, and the enclosed report on Total Leucocyte Count. I think this method has definite possibilities for the particular circumstances for which it is designed, i.e. rough checking of leucocyte counts after an atomic disaster, although I think we should have to try it out ourselves to be sure of its value. I feel a little sceptical of the accuracy claimed, particularly the results reported in Table 3 where quite frequently three out of four technicians seem to get the results exactly the same as the true count. I don't know if you want the report back, but in the hope that you don't I am hanging on to it and when the time permits we will have a go at trying it out.

Yours ever,

Air Commodore J. S. Wilson,
Director of Hygiene and Research,
Air Ministry,
1-6 Tavistock Square,
London, W.C.1.

Yours ever

Adam Linton.

Lieutenant Colonel H. W. Whitcher, T.D.,M.A.,M.B.,R.A.M.C.,
A.D.G. - A.M.D.S.,
The War Office,
S.W.1.

164A

C.95567/57/D.of H. & R.

30th January, 1959.

Dear Bill,

Would you look at the attached, and let me have your comments on the value of the technique.

We will not be requiring blood examination for troops going overseas for quite a long time now.

Yours sincerely,

S D Clark

(Dictated by Air Commodore J.S. Wilson, and signed in his absence)

Air Commodore W.P. Stamm, MB., BS., FRCP.,
Consultant in Pathology & Tropical Medicine,
R.A.F. Institute of Pathology & Tropical Medicine,
Halton,
Bucks.

Yours ever

Adam Linn

Lieutenant Colonel H. W. Whitcher, T.D.,M.A.,M.B.,R.A.M.C.,
A.D.G. - A.M.D.8.,
The War Office,
S.W.1.

From: Group Captain A. MUIR, M.A.,B.Sc.,M.B.,Ch.B.,M.R.C.P.(Edin),
D.T.M. & H.(Eng)

140A 13

CONFIDENTIAL

EUSTON 5040

Ref. C.95567/57/M.A.5

1-6 Tavistock Square,

London, W.C.1.

15th January 1959.

Dear Johnie,

Thank you for your letter.

2. I shall be very pleased to learn in due course the result of your conversations with George Knauf.

3. And I should be grateful for your help in finding the answer to another problem. When I visited the Walter Reed in October, I met a civilian radiologist Dr. J. J. Nickson from New York, who was lecturing to the Medical Officers' Course that day. He told me the National Commission for Radiological Protection, the American counterpart of the I.C.R.P., either had just abolished or were about to do so the requirement for blood examinations in the monitoring of possible exposure to ionising radiation. After my return to this country I wrote to him at his New York address asking him for further information, but so far I have had no reply. So could you look into the question, and if possible send me over a copy of the original legislation and the suggested amendment. It is of importance, because new regulations to include blood examinations have been proposed for U.K. Many people, myself among them, feel this should not be allowed to pass into law, so the evidence from the U.S.A. may help in preventing it.

Yours sincerely
Adam Muir.

Group Captain J. S. Howitt, A.F.C.,M.R.C.S.,L.R.C.P.,
British Joint Service Mission (Air Force Staff),
Washington, D.C.,
B.A.P.O.2

Yours ever
Adam Muir.

Lieutenant Colonel H. W. Whitcher, T.D.,M.A.,M.B.,R.A.M.C.,

From: Group Captain A. Muir, M.A., B.Sc., M.B., Ch.B., M.R.C.P.(Edin), D.T.M.& H., R.A.F.

139A

Tel.No. Euston 5040
Ext. 314.

AIR MINISTRY,
1-6 TAVISTOCK SQUARE,
LONDON, W.C.1.

Ref: C.95567/57/M.A.5

14th January, 1959.

CONFIDENTIAL

Dear Harold,

Thank you for your letter of 12th January.

2. It is always a pleasure to discuss these 'medico-scientific' questions with you, so I leave it to you to name the date, (I shall be at Aldermaston all next week from 19th to 23rd January).

3. But may not some misunderstanding have arisen concerning the approach to the M.R.C.? All we (certainly I) wished them to consider was the value of blood examinations in the problem of monitoring ionising radiation.

4. We know that Harwell have practically abandoned them, that our American colleagues do not use them, unless perhaps in a very minor way, for those taking part in Atomic Trials, and that the American National Committee for Radiological Protection have taken or are about to take action to delete them from their statutory requirements.

5. You have also seen or heard written opinions to the Task Force Commander Grapple from Air Commodore Stamm and myself. Neither he or I have subsequently heard any arguments that would make us alter those opinions which more or less coincided.

6. In my view it would be unfair to ask the M.R.C. to decide policy for us. That surely is the responsibility of the services themselves, who must apply accepted medical doctrine to the special circumstances on land, sea, and in the air, on which we can reasonably claim to be 'experts', and of which the M.R.C. as a body may be largely unaware.

7. But an official expression of opinion from the M.R.C. on the scientific question involved may result (one hopes!) in altering the proposed new regulations under the Factories Act which, although they are not legally applicable to the services, appear to furnish one of our main difficulties in framing a common polic

Yours ever

Adam Muir.

Lieutenant Colonel H. W. Whitcher, T.D., M.A., M.B., R.A.M.C.,
A.D.C. - A.M.D.8.,
The War Office,
S.W.1.

CONFIDENTIAL

Tel.No. GRO.8040 From: Lt.Col. H.W.Whitaker, T.D., M.A., M.B., RAMC.

138A

CONFIDENTIAL

THE WAR OFFICE,
LONDON, S.W.1.

12 January, 1959.

Ref.No.

Dear Adam

I would like to discuss with you the drafting of a short paper for our respective Chiefs, prior to approach to the MRC, on the following:-

" A unified policy for the Services concerning blood and other medical examinations for personnel who will be , or might be exposed in the course of their duties, to radiation levels exceeding those normally acquired from background sources."

Will you please suggest an initial date when we may begin discussion of the problem.

Yours sincerely

Harold.

Group Captain A. Muir, OBE, MB, MRCPE,
DTM & H.
Air Ministry (MA5),
Tavistock Square,
London.

MDF

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(a) ascertaining wha... areas and locations, which coula ...

(i) prediction in the case of those normally the controlled areas or locations (mainly airc health physics and decontamination personnel) personnel need be examined before departure fo the remainder on arrival at the Island;

(ii) selection in the case of those not nor the controlled areas or locations (mainly sur ional personnel - trades and numbers being de ...operational requirements at t...

136A

137A

From: Group Captain A. Muir, M.A.,B.Sc.,M.B.,Ch.B.,M.R.C.P.(E), D.T.M.& H.

EUSTON 5040

Ref. C.95567/57/M.A.5

1-6 Tavistock Square,

London, W.C.1

5 December, 1958.

Dear Air Commodore.

Here is a copy of a letter I am sending to No.14 Maintenance Unit in answer to their query enclosed for your information.

I should like to know more about the extent of the work with Radio Active Sources performed by the Unit. If you are agreeable I shall instruct Squadron Leader Sturrock of M.T.E. & D. Warton to inspect the Unit from this point of view, and report his findings to us.

Yours sincerely

Adam Muir.

Air Commodore G. W. McAleer,
Headquarters,
Maintenance Command,
Royal Air Force,
Amport,
Andover,
Hampshire.

examination to ...

(a) ascertaining what personnel are required ... areas and locations, which could be done by,

(i) prediction in the case of those normally empl... the controlled areas or locations (mainly aircrew, A... health physics and decontamination personnel) - only ... personnel need be examined before departure for the ... the remainder on arrival at the Island;

(ii) selection in the case of those not normally ... the controlled areas or locations (mainly survey a... ional personnel - trades and numbers being depende... damage and the operational requirements at the tim... personnel would have to be both selected and exami... Island;

136A

C.95567/57/M.A.5 ✓ 5 December, 1958

Sir,

In reply to your letter 14/523/2/3/P.C. GRA/S.104/ of 1st December, 1958, I am to state that Medical Examinations of Workers exposed to Radio Active Materials are to be conducted in accordance with A.M.O. A.129 of 1958.

I am, Sir,
Your obedient Servant,

(A. MUIR)
Group Captain
for Director of Hygiene and Research

The Officer Commanding,
No.14 Maintenance Unit,
Royal Air Force,
Carlisle

Copy to: Air Officer Commanding in Chief,
Maintenance Command (P.M.O.)

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personnel who proceed to Christmas Island and its i

3. Adoption of the course at para. 2 (a) above (i.e. c
examination to certain personnel) would entail:

(a) ascertaining what personnel are required to

1/1135A

Telephone :
Carlisle 23422-30 Extn.....
Telegraphic Address :
[redacted] Carlisle.

Correspondence on the subject of this letter should be addressed to the
OFFICER COMMANDING
and should quote the reference
14/523/2/3/P.C.

Your Reference .....

No. 14 MAINTENANCE UNIT,
ROYAL AIR FORCE,
CARLISLE,
CUMBERLAND.

C 9814R

24th November, 1958

The Director General of Medical Services,
Air Ministry,
1/6 Tavistock Square,
London, W.C.1.

Employees Subject to Radio Active Sources

It is requested that a reply may now be given to this Unit's letter reference 14/C.244/1/MED (now re-referenced 14/523/2/3/PC) dated 14th October, 1958.

D. Bryan

Civil Assistant and Accountant
For Officer Commanding
No. 14 Maintenance Unit
Royal Air Force

memo to Ill MO. Letter quoted not rec'd by MAS. Copy requested. 26/11/58
LB W/O 381

GRA/S.10

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examination to certain personnel) would entai

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H.Q. Ta
27th Oct

1355

Telephone :
Carlisle 23422-30 Extn.....
Telegraphic Address :
[redacted]in, Carlisle.
Correspondence on the subject of this letter should be addressed to the
OFFICER COMMANDING
and should quote the reference
14/523/2/3/P.C.

No. 14 MAINTENANCE UNIT,
ROYAL AIR FORCE,
CARLISLE,
CUMBERLAND.

1st December, 1958

Your Reference C.98148/57

The Director General of Medical
Services,
Air Ministry,
1/6, Tavistock Square,
London, W.C.1.

Employees Subject to Radio Active Sources

Reference Air Ministry memorandum dated 26th November, 1958. Herewith copy of this Unit's letter 14/523/2/3/P.C. dated 14th October, 1958, as requested.

Civil Assistant and Accountant
For Officer Commanding
No. 14 Maintenance Unit
Royal Air Force

Encl.

COPY.

135C

14th October, 1958

14/523/2/3/P.C.

The Director General of Medical Services,
Air Ministry,
1/6, Tavistock Square,
London, W.C.1.

Employees subject to Radio Active Sources

It is requested that in accordance with Air Ministry Order A.91/1953, paragraph 19, a copy of D.G.M.S. instructions to medical officers regarding the standards required when examining employees subject to Radio-Active Sources, may be forwarded to this Unit for the information of the Civilian Medical Practitioner, Dr. Ingall.

Original signed.

Civil Assistant and Accountant
For Officer Commanding
No. 14 Maintenance Unit
Royal Air Force

S E C R E T

LOOSE MINUTE

GRA/S.104/6/Org.

A.M./M.A.5 (Gp. Capt. MUIR) 4/11

Copy to: A.M./M.A.4 ✓

Radiological Safety Precautions - Medical Examination of Personnel Posted or attached to Christmas Island

1. Reference is made to Air Ministry letter C.95567/57/M.A.4 dated 13th October, 1958 on the above subject. As opinion on the subject and its application are not unanimous, and especially as the application detailed in the above-mentioned letter would not give the desired medico-legal coverage from either the Service or the public point of view, the following comments are made with a view to changing the present arrangements to one of two alternatives.

2. It is agreed that the problem is a 'medico-legal' one, but from the medical aspect there is doubt about the value of the examination and from the legal aspect there is doubt about the extent to which the examinations should be applied. Under these circumstances and assuming that no better examination can be devised, it is considered that only two feasible course of action are open, which are:

(a) to confine the medical examinations to only those personnel who, according to the Services, are subject to radiological risk, i.e. personnel who enter any of the so-called "controlled areas or locations" on Christmas Island;

(b) to extend the medical examination to all personnel who, in the opinion of the public, might be subject to radiological risk, i.e. all personnel who proceed to Christmas Island and its immediate vicinity.

3. Adoption of the course at para. 2 (a) above (i.e. confining the examination to certain personnel) would entail:

(a) ascertaining what personnel are required to enter the controlled areas and locations, which could be done by,

(i) prediction in the case of those normally employed in the controlled areas or locations (mainly aircrew, A.W.R.E. health physics and decontamination personnel) - only key personnel need be examined before departure for the Island the remainder on arrival at the Island;

(ii) selection in the case of those not normally employed the controlled areas or locations (mainly survey and constructional personnel - trades and numbers being dependent on bomb damage and the operational requirements at the time) - such personnel would have to be both selected and examined on the Island;

/ (b)

SECRET

(b) making available on the Island the means of doing the medical examination;

(c) issuing to each person examined and who came up to the medical standards, a special medical certificate to that effect;

(d) each person producing both his identification card and his special medical certificate to the Security Guard before being allowed to enter a controlled area or location - thus ensuring positive control of all personnel entering areas or locations of known radiological risk.

4. Adoption of the course at para 2(b) above (i.e. extending the examination to all personnel) merely involves including those R.A.F. trade groups at present omitted - the Admiralty and the War Office already having undertaken to subject all their relevant personnel to the required medical examination. Adoption of this course gives the choice of conducting the medical examination either before personnel proceed to the Island, or after arrival at the Island (except key personnel who should be examined before departure to avoid costly replacement in the event of their being found unfit).

5. The Task Force Commander has indicated that he prefers the medical examination to be applied to all personnel, on the grounds that to do so would meet both the Service and the public requirements.

6. It would be appreciated if the foregoing could be considered at an early date, and new instructions on the relevant medical examination issued accordingly.

N.S. Petch.

(N.S. PETCH)
Wing Commander,
Air Logistics/S.O.A.

H.Q. Task Force Grapple
27th October, 1958

SECRET

/32

SECRET

Tel. No. EUSton 5040
Extn. 317
Correspondence on the subject of
this letter should be addressed to:-
THE UNDER SECRETARY OF STATE,
AIR MINISTRY,
and should quote the reference:-
C.95567/57/M.A.4

AIR MINISTRY,
1-6, TAVISTOCK SQUARE,
LONDON, W.C.1.
13 OCT 1958

Sir,

Radiological Safety Precautions
Persons Selected for Service at Christmas Island

126A.

I am directed to refer to Air Ministry letter C.95567/57/D.D.Av.Med. dated 23rd September, 1958.

2. In order that all personnel proceeding to Christmas Island may be covered by this letter the preamble thereto is to be amended from "Medical Examination of Personnel posted to Christmas Island" to read "Medical Examination of Personnel posted or attached to Christmas Island".

3. I am to say with reference to paragraph 2 of the above Air Ministry letter that the reservation therein, "provided that they are required to work in the controlled area" has now been clarified and in future the posting or attachment notices of all personnel required to work in this area will be annotated to the effect that they are to be examined in accordance with Air Ministry letter C.95567/57/D.D.Av.Med. dated 23rd September, 1958.

4. I am to point out that the above arrangement will cover the cases of service and civilian personnel with the exception of certain flying and ground members of operational squadrons ordered to Christmas Island as units directly from their parent stations. All such personnel will require examination and arrangements for this are to be made at Command level.

5. Blood examinations and Chest X-Rays, (where the latter will not be routinely carried out at Personnel Holding Unit when it is known that an individual will not be passing through such a unit) are to be arranged at Service Medical establishments in all possible cases. In cases remote from Service Medical facilities every effort is to be made to ascertain the costs of civilian examination and such costs will only be entertained when the cost of transport to the nearest Service facility plus the pay of the individual concerned (to the nearest day) exceeds them.

6. Form Med. 42 is to be raised in respect of all service personnel examined. Air Ministry form 1928 is similarly to be raised for civilians.

I am, Sir,
Your obedient Servant,

Cancelled by A.M letter Rad Med 8/MAir dtd 19/11/59

(M.W.L. WHITE)
Wing Commander
for Director of Hygiene and Research

All Principal Medical Officers,
At Home and Overseas.

Senior Medical Officer,
90 Group
A.H.Q. Malta

/Copy to:-

G.10582/EC/10/58/50

SECRET

RADIATION DOSE REPORT

Copy to:-

I.P.T.M.

Air Log O,
Task Force Grapple (Rear).

A.W.R.E. (S.S.P.T.),
Aldermaston.

The Secretary,
Admiralty,
(M.D.G.),
London, S.W.1.

Secretary of State,
War Office,
(M.D.),
Whitehall, S.W.1.

Ministry of Supply,
(D.A.W.T.),
St. Giles Court,
W.C.2.

Folder G.10/M.A.5

C.E.4(k)

F.3

R.A.F. Form

...RANDUM

131A

M.A.4 SECRET 3 October 1958

G.10/S/M.A.5

SECRET

Sir,

Radiological Safety Precautions for Personnel in the United Kingdom detailed for duty at Christmas Island

126A

I am directed to refer to the attached letter to all Principal Medical Officers which details the medical examination now required for all persons selected for duty at Christmas Island.

2. It has been notified to this Directorate by Headquarters Task Force Grapple (Rear) that only members of the following branches and trades will be required to work in the controlled area:-

(a) All officers.
(b) Air and ground crews of flying squadrons.
(c) Airmen of the following trade groups:-
(i) 1-6 inclusive
(ii) 9
(iii) ~~22~~ 13
(iv) ~~30~~ 14
(v) ~~40~~ 22

A/c

3. It is requested that agencies responsible for the preparation of personnel before proceeding to Christmas Island

/may

Air Officer Commanding-in-Chief,
Home Command,
Royal Air Force,
White Waltham,
Maidenhead, Berks.

SECRET

.2200 12m pads 8/55 A.O.St. Signature of Sender.....

Your obedient Servant,

Cancelled by AM letter RAD MED 8/MA4 dtd 19/11/59

(J. S. WILSON)
Air Commodore
Director of Hygiene and Research

All Principal Medical Officers,
At Home and Overseas

SECRET

may be instructed to annotate the documents of members of the branches and trades concerned as follows: "For medical examination in accordance with paragraph 4 of Air Ministry letter C.95567/57/D.D.Av.Med. dated 23rd September 1958".

I am, Sir,
Your obedient Servant,

(M. W. L. WHITE)
Wing Commander
for Director of Hygiene and Research

SECRET

317

130A

C.95567/57/M.A.4 ✓ SECRET 3rd October 1958

Sir,

Radiological Safety Precautions at Christmas Island
Medical Examination of Personnel Posted to Christmas Island from the United Kingdom

I am directed to refer to Air Ministry letter C.95567/57/D.D.Av.Med. dated 23rd September 1958 and to request that arrangements may be made to carry out the blood examination and chest x-ray detailed therein upon any individuals at present at Christmas Island and required to work in the controlled area who may not have been so examined in the United Kingdom before departure.

I am, Sir,
Your obedient Servant,

(M. W. L. WHITE)
Wing Commander
for Director of Hygiene and Research

Principal Medical Officer,
Headquarters,
Home Command,
Royal Air Force,
White Waltham,
Maidenhead, Berks.

SECRET

,2200 12m pads 8/55 A.O.St. Signature of Sender.....

Your obedient Servant,

Cancelled by AM letter RAD MED 8/MA4 dtd 19/11/59

(J. S. WILSON)
Air Commodore
Director of Hygiene and Research

All Principal Medical Officers,
At Home and Overseas

R.A.F. Form

A.M. Form 1150 A.

AIR MINISTRY MEMORANDUM

129

M THE UNDER-SECRETARY OF STATE
AIR MINISTRY (MA2)

Tel. No. ..... Ext. .....
Ref. No. ..... Date 26.9.58

TO D.D. Av. Med. A

In reply your ref. .....
Dated .....

SUBJECT: Christmas Isle Postings

126 A

In view of your recent policy letter regarding these postings would you please advise if civilians are required to have blood tests and chest X-rays?

Replied by memo forwarding copy of 132A
15/10

Thank you

U.

...necessary.

...200 12m pads 8/55 A.O.St.

Signature of Sender .....

Your obedient Servant,

Cancelled by AM letter RAD MED 8/MAY dtd 19/11/59

(J. S. WILSON)
Air Commodore
Director of Hygiene and Research

All Principal Medical Officers,
At Home and

From: Air Vice Marshal E.A. Daley C.B.E.

1064

C.95567/57/D. of H.& R.

31st March, 1958

Air Vice Marshall E. A. Daley, C.B.E., F.R.A.C.P., Q.H.P.,
Director General of Medical Services,
Royal Australian Air Force,
Melbourne, S.C.1.

Radiochemical Urinalysis

Receipt is acknowledged of your 33/501/46 dated 17th March, 1958 and the following answers given to the questions stated -

(a) a sample of up to six specimens taken as a check,

(b) monthly or quarterly, according to exposure to radiation and findings,

(c) while servicing of radioactively contaminated aircraft continues. This may continue for some years, or cease at end of current test series. Much depends on political climate.

(d) for I 131 usually, but possibly for Sr90 upon occasion.

2. The examinations are required to act as a check on safety precautions.

J. S. WILSON

(J. S. WILSON)
Air Commodore
Director of Hygiene and Research

...health, immediately.

(E.A. DALEY)
Air Vice Marshal
Director General of Medical Ser

SECRET

and to me the easy of removal by smear (how well it is stuck on appears perhaps more important)
At Edinburgh a very

97A

105A

om: Air Vice Marshal E.A. Daley, C.B.E., F.R.A.C.P., Q.H.P.

ROYAL AUSTRALIAN AIR FORCE
MELBOURNE, S.C.1

DGMS/58/58

20th February, 1958.
Received 27/3/58

Dear Wilson,

I refer to your D.O. letter of the 5th February, in which you enquire concerning the arrangements made for examining urine of personnel exposed to the risks of ingesting or inhaling radio-active material.

We have been pressing the other Services and Departments to pursue these matters as quickly as possible, and the techniques have been reviewed. However, before giving any indication as to whether Adelaide or any other centre can meet the require-ments that you request, I have asked the Commonwealth Department of Health (that is, X-Ray and Radium Laboratories) to give me details as soon as possible.

I will forward this information to you as soon as an accurate statement has been received.

Yours sincerely,

E.A. Daley.

Air Commodore J.S. Wilson, M.B., Ch.B., D.P.H.,
Air Ministry, (D. of H.& R.),
Whitehall Gardens,
LONDON, S.W.1.

above questions, I will forward this information on to the Comm
wealth Department of Health, immediately.

E.A. Daley.

(E.A. DALEY)
Air Vice Marshal
Director General of Medical Servi

SECRET

(97A)

SECRET

COMMONWEALTH OF AUSTRALIA

(104A)

C9556/57

TELEPHONE:
MXY 550

TELEGRAPHIC ADDRESS:
"AIRFORCE MELBOURNE"

IN REPLY QUOTE 33/501/46

DEPARTMENT OF AIR

MELBOURNE, S.C.1

17 MAR 1958

Air Commodore J.S. Wilson, M.B., Ch.B., D.P.H.,
Air Ministry (D. of H.& R.),
Whitehall Gardens,
LONDON. S.W.1.

RADIOCHEMICAL URINALYSIS

1. Further to my DGMS/58/58 of the 20th February, 1958, a reply has just been received from the Commonwealth Department of Health (X-Ray and Radium Laboratory) concerning the subject matter raised in your D.O. letter of the 5th February.

2. Enquiries are being made by the Department of Health as to whether adequate facilities do exist for this work. However, in the meantime, they have requested that an estimate, if possible, be supplied to them of -

(a) the number of persons to be examined;

(b) the frequency of examinations;

(c) the period over which it is desired to maintain periodic examinations;

(d) whether tests are required for the presence of all the isotopes listed or only for some.

3. If you could let me have the details and estimates to the above questions, I will forward this information on to the Commonwealth Department of Health, immediately.

Ea Daley

(E.A. DALEY)
Air Vice Marshal
Director General of Medical Services.

SECRET

[illegible] else but strontium due to decay rates [illegible] for
and to me the easy of removal by smear (how well it is
stuck on appears perhaps more important.)
At Edinburgh a very good survey was carried out by Mr Beaver
one of Mr Dale's registrars, and a lot of mutual gain
occurred, it may be possible that Mr Dale would like to send
Beaver up with us. I should very much like to know when these
engines are going to turn up ? What will happen if we are
in Christmas ? Will David cope? Have they got an effluent
and waste disposal scheme going at 32 M.U. and enough

97A

103A

LOOSE MINUTE

GRA/S.104/6/GRG

D. of P.(G)

Copies to: D. of P. (A)
D. of H & R.

Medical Examinations - Atomic Weapons Trials
Christmas Island

1. Referring to your loose minute D.D.P(G) 1/480/58 dated 26th February, 1958, the posts for Officers of the ground branches are amended as follows:-

(a) S.T.O. (present incumbent Wg.Cdr.McKelvey)
(b) Sqn.Ldr Eng. " " Sqn Ldr Munro
(c) Sqn.Ldr Sigs " " Sqn Ldr Hine (S)
(d) Flt.Lt. Sigs " " Flt. Lt Holmes
(O.C. Radio Servicing Flight)
(e) Flt. Lt Arm. (Officer being selected)
(O.C. Arm & Photo Sect and Advisor to Task Force HQ)
(f) Flt. Lt. Eng. (present incumbent Flt.Lt. Murray
(g) Flt. Lt. " " Flt Lt Churcher
Regt. (2) Flt Lt W.H.A.Senke
(Decontamination Team)

2. Of the above Officers, Sqn.Ldr. Munro, Flt. Lt. Holmes and Flt. Lt. Murray are already at Christmas Island. The remaining officers will be proceeding to the Island within the next two weeks.

Swanwick

(G.W. SWANWICK)
Squadron Leader,
Air Log 'O'
Task Force Grapple

28th February, 1958

C9567

96

litt

done is, I think, the lack of volunteers. published works are on animals. I will keep my ears open for any scraps of information.

a 5. It should be possible to demonstrate Strontium from the engine parts by either chemical

LOOSE MINUTE

D.D.P.(G)1/480/58

Task Force Commander, Task Force Grapple

Copies to:- D. of P.(A)
D. of H. & R.

Medical Examinations - Atomic Weapons Trials, Christmas Island

In reply to your loose minute GRA/S.104/6/Org. dated 6th January, 1958, in so far as officers of the ground branches are concerned, it is understood that the posts referred to are:-

(a)	S.T.O.	(present incumbent Wg. Cdr. McKelvey)
(b)	Sqn. Ldr. Eng.	(" " Sqn. Ldr. Munro)
(c)	Sqn. Ldr. Sigs.	(" " Sqn. Ldr. Hine)
(d)	Flt. Lt. Sigs.	(Station Signals officer)
(e)	Flt. Lt. Arm.	(Advisor to Task Force H.Q.)

Perhaps you would let me know if any other posts are involved in which this Directorate is directly concerned.

2. Arrangements will be made for the examination of these officers.

T. J. HANLON

(T. J. HANLON)
Group Captain
for D. of P.(G)

26 February, 1958
BG

published works are on animals. I will keep my ears open for any scraps of information.

Para 5. It should be possible to demon

97A

101A

AL From: Gp. Capt. A. Muir, M.A.,B.Sc.,M.B.,Ch.B.,M.R.C.P.(E).
D.T.M.&H.

2-8 RICHMOND TERRACE,

C.95567/57/M.A.5

25 February, 1958

Dear

Thank you for your letter dated 19th February. I suggest then making a start on the urines. Will you please organise this and ask me for any assistance you require. It would be simpler to begin with a trial run of two selected at random, and when the snags are sorted out a more extensive series can be attempted.

The engines have not left Australia yet,but they should be arriving anytime. One signal apparently went astray - hence the delay. There should not be much difficulty at St. Athan as Sqn. Ldr. Trump, the Station Medical Officer, whom I know very well, acquired experience on the problem last time it arose there. I shall give you the E.T.A. when available.

I think it right both scientifically and practically to attempt to estimate the Strontium 90 residue, and indeed that of any other isotope thought to be a danger. Otherwise we shall not begin to have real knowledge of the extent of the health hazard we are making plans to avoid, and shall have to continue groping in the dark which is most unpleasant.

Glad to hear the young animals are doing well.

Yours ~~faithfully,~~

Sqn. Ldr. S. C. Rexford Welch,
R.A.F. Section,
A.W.R.E.,
Aldermaston, Reading, Berks.

work has been done is, I think, the lack of volonteers. published works are on animals. I will keep my ears ope for any scraps of information.

Para 5. It should be possible to demonstrate Strontium from the engine parts by either chemical or physical methods. Mic analysis and absorption curves and spectography respecti I do not quite see however

97A

99A

96A

100A

P.A.1/S.3/581

Task Force Commander, Task Force Grapple

Copies to:- D. of P.(G)
D. of H. and R.

Medical Examinations - Atomic Weapons Trials 82A

Your loose minute GRA/S.104/6/Org. dated 6th January, 1958 refers.

2. You will wish to note that no direct action is required from this Directorate. The only G.D. personnel affected by your requirement are Canberra aircrew for whom H.Q. Bomber Command is the postings authority. It is noted that the necessary instructions for the implementation of your requirement have been passed to Bomber Command.

J. M. DANIEL

(J. M. DANIEL)
Wing Commander
for D. of P.(A)

P.A.1
14th February, 1958
BG

795

published works are on animals. I will keep
for any scraps of information.

97A

96A

99A

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

TELEGRAMS ADDRESS:
ATEN, ALDERMASTON, READING
TELEPHONE: READING 0060

OUR REFERENCE:

YOUR REFERENCE:

ATOMIC WEAPONS RESEARCH ESTABLISHMENT,

ALDERMASTON,

BERKSHIRE

19th February 1957

Dear Group Captain Muir

Many thanks for your letter dated 13th February. I have been thinking about the questions that you posed and have taken some expert advice. As my answers are a little lengthy I attach them on a separate sheet.

I have injected all the piglits with iron and no further fatalities have arisen to date - I am most grateful for the tip.

Yours very sincerely,

Rexford.

work has been done is, I think, the lack of vol
published works are on animals. I will keep my
for any scraps of information.

Para 5. It should be possible to demonstrate Strontium
engine parts by either chemical or physical met
analysis and absorption curves and spectography

Answering Questions in Order

Para 2. It appears that it will not be too difficult to get active urine back to this country if the follow ng drill is carried out. a.Carrier is added to the urine this prevents the activity being removed from the solution onto or into the walls the the vessel - polythene is particularly bad. b. Some preservative must be added to prevent bacterial decomposition and to assist the nasal organs of the people this end. c.A reasonable time lapse can be accepted - this will be upto us to see that urine gets smartly from Lynham to Aldermaston.

Para 3. The quantity of Strontium is dependent to some extent on the quantity ingested/inhaled though from a practical point of view the Body Burden 1 microcurie is a tiny quantity. The accepted rate of excreation by the kidney is 1% for the first week and then 0.1% (Half life 28 years)

Yes a considerable number of other isotopes are present. A few of the best known are -Caesium,Lanthanum,Zirconium and Barium (Fission Products cover the Periodic Table from Atomic Weights 30 to 63.) The reason why Strontium is always quoted is that it is the most unpleasent both in half life and energy and the methods of assessment precipitate all the others as well but the whole is counted as if it was strontium. This means that the worst possible view is always taken to give an inbuilt safety factor.

Para 4. Yes Strontium is a bone seeker. The reason why so little work has been done is, I think, the lack of volonteers. Most published works are on animals. I will keep my ears open for any scraps of information.

Para 5. It should be possible to demonstrate Strontium from the engine parts by either chemical or physical methods. Micro analysis and absorption curves and spectography respectively. I do not quite see however what one learns from this for it cannot be anything else but strontium due to decay rates and to me the easy of removal by smear (how well it is stuck on appears perhaps more important.)
At Edinburgh a very good survey was carried out by Mr Beaver one of Mr Dale's registrars, and a lot of mutual gain occurred, it may be possible that Mr Dale would like to send Beaver up with us. I should very much like to know when these engines are going to turn up ? What will happen if we are in Christmas ? Will David cope? Have they got an effluent and waste disposal scheme going at 32 M.U. and enough of the right sort of instruments

6. I completely agree with you that we should try and stand on our own feet and get as much information as we can from these engines. I think the hasards have been a little over played but then it is so right to err on the safety side in this game particularly as our airmen are, it must be admitted, of a slightly different calibre to the average run of scientist.

7. Cards Radiological. The Edinburgh set/up is a little difficult to predict as the population fluctuates with the trials position I think 50 might be a minimum. As long as a store of them exist it does'nt realy matter as they can be moved rapidly, by air, from U.K. - Christmas - Edinburgh.

96A

MHL/3013/I/Med.

Royal Air Force,
Melksham,
Wiltshire.

12th February, 1958

579277 Ch. Tech. Martin, C.V.

Sir,

92A

I have the honour to refer to the letters of even reference dated 27th and 28th January, 1958.

2. The report on this airman from Royal Air Force Hospital Wroughton has now been received and a copy is attached for the attention of your directorate.

I have the honour to be,

Sir,

Your obedient Servant,

(C.C.G. RAWLL)
Squadron Leader,
For Officer Commanding,
Royal Air Force Melksham.

Under Secretary of State,
Air Ministry (MA4),
Whitehall,
London.

MA5

Copy to:- Headquarters Technical Training Command (P.M.O.)
Headquarters No. 24 Group (S.M.O.)

770

Sqn. Ldr. D. St...
Medical Training Estab...
Royal Air Force,
WARTON.

MEDICAL CONFIDENTIAL

ATOMIC ENERGY AUTHORITY
97A
M.R.C.P.(E).

True Certified Copy of F. Med. 7
for Ch. Tech. Martin

28.I.58 This N.C.O. was on draft for Christmas Island.

A routine blood picture revealed a haemoglobin of 86%.
On the advice of S.M.O. 24 Group he has been taken off draft pending investigation and treatment of this finding.
Would the Physcian please see and advise on treatment and employment standard.

(Sgd) C.C.G. Rawll.
Squadron Leader,
Senior Medical Officer,
R.A.F. Melksham.

28.I.58 This S.N.C.O. had a routine blood count prior to going to Christmas Island.
White count was within normal limits, but Hb. = I2.8 gms% (86% Haldane).
He feels well. No symptoms.
Clinically there was no detectable abnormality.
Repeat Hb. = I4.I gms% (96% Haldane).
This patient is very fit and has a normal blood picture.
He is quite fit for the posting proposed. Categroy A4GI.

(Sgd) (D.J. Stoker)
Sqn. Ldr.
Medical Div.,
RAF Hosp. Wroughton

Medical Training Estab.
Royal Air Force,
WARTON.

MEDICAL CONFIDENTIAL

97A

ATOMIC ENERGY AUTHORITY

M.R.C.P.(E),

From: Group Captain A. Muir, M.A., B.Sc., M.B., Ch.B., M.R.C.P.(E), D.T.M.& H.

98A

2-8, RICHMOND TERRACE, XXXXXXXXX

C.95567/57/M.A.5 ✓

13 February, 1958

Dear

Thank you for your comments on the ~~wine~~ urine testing.

2. As Strontium is so important, we should get A.W.R.E. to do the tests if they are able to. The administrative details would have to be worked out, but it shouldn't be difficult to provide a box and bottles to be returned to Lyneham for delivery by road to Aldermaston.

3. Meanwhile it would be worth seeking answers to the following questions:-

(a) The quantity of strontium appearing in the ~~wine~~ urine after ingestion or inhalation.

(b) Are there isotopes other than 90 which should be sought, with a reasonable hope of finding them if present.

4. One has the impression that strontium lodges in bone, where it remains indefinitely, so that the quantity excreted in a given sample of urine may be too small to estimate. So any data in the possession of Mr. Barnes - there are probably people under his supervision from whom results have been obtained - would be worth unearthing.

/5.

Squadron Leader
~~Wing Commander~~ S. C. Rexford-Welch,
R.A.F. Section,
A.W.R.E.,
Aldermaston,
Berks.

Sqn. Ldr. D. Sic
Medical Training Estab.
Royal Air Force,
WARTON.

5. The next question is a chemical rather than a biological one namely to what degree are aircraft contaminated by strontium. Wouldn't it be worth trying to recover some from the engines shortly to be serviced at 32 M.U? Please enquire then if it is reasonable for a chemist to demonstrate the element if present in the interior of an engine, and if it is we might arrange for one to accompany us to 32 M.U.

6. Basic information like this is essential if health risks are to be properly assessed, so we should try to extract as much from these engines as we can.

7. I shall soon be sending the cards to Christmas, addressed to the Officer in Medical Charge. Please let me know how many should go to Edinburgh.

I am,

Yours Sincerely

Adam Kuczy

97A

UNITED KINGDOM ATOMIC ENERGY AUTHORITY
R.A.F./A.W.R.E.
ATOMIC WEAPONS RESEARCH ESTABLISHMENT,
ALDERMASTON,
BERKSHIRE

...HIC ADDRESS:
...TEN, ALDERMASTON, READING
TELEPHON... READING 0060
OUR REFERENCE:
YOUR REFERENCE:

10-II-58

Dear Group Captain ,

Many thamks for your letter it was most kind of you to answer all my vetinary questions - the little pigs get their iron tonight. I trust this will save me some P.M's in the future. I am interested in the fact that bare concrete is a bad factor as the farm where I am concerned has both earth and concrete so I should be able to get some comparisons.

Answering your questions :-
Dosage Cards. A supply at Christmas and Edinburgh perhaps also might be a good idea. Christmas could need about 60 (Aircrew 5 Canberra at crews of 4 equal 20. Active H. Flight at 30. Reserve of 10.) You may feel that a few more might be worth including.
Urinary Analysis. Its place in Health Physics - when very accurate estimations of ingestion are needed . Snag it needs a complicated setup to get the estimation. I am investigating the possibility of an easy field 'Go No Go' method but feel it is unlikely that we will get any suitable method until the efficiency of the liquid counters are improved a lot.
Who gets it. All workers potentially at hasard i.e. habitual workers with dangerous substance or those who undertake an individual hasard. Both these are obviously known and calculated in an establishment such as the AWRE.
When do they get it ? For certain substances

/the time

Sqn. Ldr. D. ...
Medical Training Estab...
Royal Air Force...

the time is a fixed one. As a rough rule the period may vary from 10 days to 3 months. This big variation is bound up in the actual Body Burden of the substances versus the chance of picking up a dose.
How many results are positive? Certainly they get some positoves but they are with very few exceptions expected before the test is done. Certain workers are contamination prone and they are usually elimated from the work - a large proportion have beenoobserved to be nail biters !

From all the above I think you will gather that though it looks very nice and tidy to tests urines and most people look on it as a simple litmus or sugar test it is infact a highly skilled business demanding considerable lab setup.

In my opinion we have little to worry on trials if the officers i.c. are round and about with the men - slackness could breed danger. Edinburgh is a very different problem men are working for upto two years on a/c which definitely have a considerable Stront hasard and I would personnaly feel happier if urines were done on them at regular intervals. These specimens could be sent back to AWRE if suitable opportunities were taken for air transit.

I am sorry that I have written so much but feel that this 'urine empire' needs a little perspective.

Yours very sincerely,

Rexford.

P.S. The stamps were unnecessary as it is a pleasure to entertain a colleague. Anyway it is only 3/6 so I return 1/- to keep the account square.

...Muir, M.A., B.Sc., ... D.T.M. & H. ... Ch.B., M.R.C.P.(E),

From: Air Commodore J. S. Wilson, M.B., Ch.B., D.P.H.
(D.of H.& R.)

94

6687

C.95567/57/D.of H.& R. 5th February, 1958

Dear

Would you please let me know if arrangements can be made for examining urine of personnel exposed to the risk of ingesting or inhaling radioactive material.

Some of those stationed at Maralinga and Edinburgh Field have to incur this hazard from time to time. Here, in the Atomic Energy Establishments, urine tests are carried out on those at risk, but these are much too elaborate and specialised for routine use in the service. Air Commodore Denis Wilson is certain that the facilities exist both in Adelaide and in other centres, and could be used if required in an emergency or when considered necessary.

If you could let me have more details, including the fee payable, I shall ask the R.A.F. liaison officer to arrange a formal contract.

Yours

Air Vice Marshal E.A. Daley, C.B.E., F.R.A.C.P., Q.H.P.,
Director General of Medical Services,
Department of Air,
MELBOURNE, S.C.1
Australia.

...81/20. Wt.

Sqn. Ldr. D. ...
Medical Training Estab...
Royal Air Force,
WARTON.

...Muir, M.A., B.Sc., ...(Rtd.), D.T.M. & H. ... Ch.B., M.R.C.P.(E),

93A

Loose Minute

O.S.2b/1506

M.A.9 (Group Captain Muir)

1. With reference to our recent telephone conversation about Army Forms A.20 and A.21, I have obtained copies of these and have arranged ~~for photographic production~~ [illegible] to produce 600 copies of each which will be forwarded direct to you.

2. You will no doubt let us know in due course if these are to become Joint Service Forms or if you are likely to require further supplies of the present ones, so that we may make the necessary arrangements with the War Office to provide them.

received 29/1 Wl. Wks

(G. G. CRAIG)
Stationery and Printing Officer.

30.1.58
AL

a.m.
3/2.

548

...81/20. Wt...

Sqn. Ldr. D. ...
Medical Training Estab...
Royal Air Force,
WARTON.

MEDICAL CONFIDENTIAL

...Muir, M.A., B.Sc.,
...(E). D.T.M. & H.
...Ch.B., M.R.C.P.(E),

92A

MEL/9013/I/Med.

Royal Air Force,
Melksham,
Wiltshire.

27th January, 1958

579277 Ch. Tech Martin, C.V.

Sir,

I have the honour to refer to the examination of the above named airman for fitness to proceed to Royal Air Force Christmas Island in accordance with the letter C.95567/57/dated 31st October, 1957.

21A

2. This airman was found to have a haemoglobin of 86% (Haldane) as shown on the attached copy of Form Med. I2.

3. The advice the Senior Medical Officer, 24 Group was sought and he advised, after consultation with IPTM, that he be taken off draft and referred to Royal Air Force Hospital Wroughton for investigation and treatment. This has been done.

4. This is referred to your directorate as requested.

I have the honour to be,

Sir,

Your obedient Servant,

(C.C.G. RAWLL)
Squadron Leader,
For Officer Commanding,
R.A.F. Melksham

The Under Secretary of State,
Air Ministry (MA4),
Whitehall,
London. W.I.

a h.
3/2.

Copy to:- H.Q. No. 24 Group (SMO) and Headquarters T.T.C. (PMO).

573
400

Sqn. Ldr. D. ...
Medical Training ...
Royal Air Force,
WARTON.

CONFIDENTIAL

REQUEST FOR SPECIAL EXAMINATION

F. Med. 12 (Gummed)
(Insert carbon to make copy of Parts I and II)

PART I. LABORATORY/X-RAY/ W roughton 446

Ward No.	Delete as necessary	Hospital (if out-patient, state unit)
	WALKING STRETCHER WARD	R.A.F. Melksham

Service No.	Rank/Rating	Name and Initials	Age
579277	CH. Tech.	Martin, C.V.	31

To :

Pathologist, R.A.F. Hospital Wroughton

Laboratory specimen : including date and hour of collection	Examination required
	H6 RBC WBC and D.H and stained film.

Diagnosis : short statement of case, including treatment and progress

Warned for duty in Christmas Island. AM letter C.9 5567/57/MA4 dated 31.II.57 refers.

Previous Report Nos. C.C.G. RAWLL Sqn. Ldr. S.M.O. 27.I.58

M.O.I.C. case — Date

W.B. & Co. Ltd. 1040.

PART II. Report No.....

Haemoglobin - I2.8 gms% (86% Haldane)
Total R.B.C. - millions
Total W.B.C. - 9,300 per cu mm
Differential - Polymorphs - 58%
Lymphocytes - 34%
Monocytes - 6%
Eosinophils - 2%

Film -

Date of report 20 JAN. I958 Signature & Appointment (Sgd) ..... Flt. Lt.

Certified True Copy

From: Group Captain A. Muir, M.A., B.Sc.,
M.B., Ch.B., M.R.C.P.(E), D.T.M. & H.

6591

91A

C.95567/57 ✓

20th January 1958

Dear Air Commodore,

Here is a list of the radiation dosage received by personnel in Operation Antler.

The Director of Hygiene wishes to know if you have any comments to make on these.

I should be grateful if you would return them in due course.

Yours Sincerely
Adam Muir.

Air Commodore D. A. Wilson, A.F.C., M.R.C.S.,
L.R.C.P., F.F.R., D.M.R.E., D.M.R., Q.H.S.,
Central Medical Establishment,
Royal Air Force,
Kelvin House,
Cleveland Street,
W.1.

...J. Hill, C.B.E., M.B., Ch.B., D.P.H.,
Principal Medical Officer,
Headquarters, Home Command,
Royal Air Force,
White...

Group Captain A. Muir, M.A., B.Sc., M.B., Ch.B., M.R.C.P.(E),
D.T.M. & H.

2-8 RICHMOND TERRACE

6591

Ref: C.95567/57/M.A.4

17th January 1958

CONFIDENTIAL

Dear Air Marshal Hill,

Re our telephone conversation concerning blood examinations for personnel posted to Grapple, I learned from Air Commodore Weir that the letter in question was sent out as a result of advice from Wing Commander Urquhart on 8th November contained in a minute (copy enclosed).

As only 25% of the technicians will be employed on these duties this figure was added by the staff at Grapple itself.

I should think it may be a difficult administrative problem to find the right 25% to examine, but I shall look into this when I visit Rexford-Welch at Aldermaston in a few days' time. It would seem to me much simpler to perform the tests at Christmas Island - presumably they have the necessary facilities there.

I shall certainly inform you of any future medical requests made to Grapple from here, and I shall be very happy to pay you a "liaison" visit when I know more about the organisation.

Yours Sincerely

Adam Muir.

Air Vice Marshal J. Hill, C.B.E., M.B., Ch.B., D.P.H.,
Principal Medical Officer,
Headquarters, Home Command,
Royal Air Force,
White Waltham,
Maidenhead, Berks.

Sqn. Ldr. D. STURROCK,
Medical Training Establishment,
Royal Air Force,
WARTON.

HRC. From: Group Captain A. Muir, M.A., B.Sc.,M.B., Ch.B., M.R.C.P.(E), D.T.M. & H.

89A

TRAfalgar 8811
XXXXX Ext. 6591

2-8, RICHMOND TERRACE,

Ref: C.95567/57/M.A.4.

17th January, 1958.

Dear John,

Squadron Leader Sturrock has forwarded to this Directorate the attached "Brief" in reply to your query in 1G/1885/15/MED. dated 9th January. I agree with the contents. So far as I am aware no definition for periods of exposure for less than one week has been attempted. It is the weekly dosage that constitutes the work safety criterion.

I hope you are enjoying life at Bawtry.

With kind regards and best wishes for 1958,

Yours ever

Adam.

Group Captain J. B. Ross, M.B., Ch.B., D.T.M. & H.,
Headquarters, No.1 Group,
Royal Air Force,
Bawtry,
Doncaster,
Yorks.

Sqn. Ldr. D. STURROCK,
Medical Training Establishment,
Royal Air Force,
WARTON.

MEDICAL CONFIDENTIAL

From: Group Captain A. Muir, M.A., B.Sc., M.B., Ch.B., M.R.C.P.(E), D.T.M. & H.

86A

6591

Ref: C.95567/57/M.A.4 ✓

16th January 1958

Dear Sturrock,

I am replying to Group Captain J. B. Ross' query on the lines forwarded to this Directorate with your letter of 14th January.

With many thanks for the brief.

Yours sincerely

Adam Muir.

Squadron Leader D. Sturrock,
Medical Training Establishment,
Royal Air Force,
Warton,
Nr. Preston,
Lancs.

ENCL.

The Under Secretary of State,
Air Ministry (D.of H.& R.)
London, S.W.1.

Sqn. Ldr. D. STURROCK, M.B., Ch. B.,
Medical Training Establishment,
Royal Air Force,
WARTON.

85A

Medical Training Establishment,
Royal Air Force,
Warton,
Nr. Preston,
Lancashire.

MTE/OFF.SCH/6022/1/Med.

14 January, 1958

Sir,

Hygiene and Sanitation - Royal Air Force
Waddington

Exposure to Radiation

85C

I have the honour to forward a copy of Headquarters No.1 Group letter 1G/1885/15/Med. dated 9th. January, 1958, together with a brief to formulate a reply.

2. Receipt of the above mentioned letter has been acknowledged.

I have the honour to be,

Sir,

Your obedient Servant,

D Sturrock.

(D. STURROCK)
Squadron Leader.
For Officer Commanding,
Medical Training Establishment

ENCL.

The Under Secretary of State,
Air Ministry (D.of H.& R.)
London, S.W.1.

400

Sqn. Ldr. D. STURROCK, M.B., Ch. B.,
Medical Training Establishment,
Royal Air Force,
WARTON.

MEDICAL CONFIDENTIAL

CONFIDENTIAL

85B

BRIEF ON LETTER 1G/1885/15/MED DATED 9th JANUARY, 1958

1. The Recommendations of the International Commission on Radiological Protection include only one dose rate, viz 300 millirad per week which interpreted means 300 millirad per seven days of a forty hour working week.

2. Reduced to an hourly dose rate this is 7.5 millirad per hour and this is sometimes called a "tolerance" of dose rate.

3. The dose rates mentioned in the above letter are 32 and 48 millirad per hour respectively. In other words are well above this unofficial tolerance mentioned in paragraph 2. This I believe is what might have raised the query.

4. There is, of course, no reason to take any other action than to ensure that the total to individuals is kept to the minimum and it should be less than 300 millirad per week of seven days.

Sqn. Ldr. D. STURROCK,
Medical Training Establishment,
Royal Air Force,
WARTON.

MEDICAL CONFIDENTIAL

85C

MEDICAL CONFIDENTIAL

COPY

1G/1885/15/Med.

From:- Gp.Capt. J.B. ROSS, M.B., Ch.B., D.T.M.& H.

Headquarters, No.1 Group,
Royal Air Force,
BAWTRY,
Doncaster,
Yorks.

9th. January, 1958.

Hygiene and Sanitation - Royal Air Force, Waddington
Exposure to Radiation

At Waddington the other day I was visiting together with the Principal Medical Officer, Bomber Command when we were asked to give an opinion on the acceptibility or otherwise of radiation dosages being received by certain radio technicians who spend some time in contact with calibration sources.

2. Total weekly doses were all well under the 0.3 rad.

3. The question of whether or not dose rates were excessive was then raised. The highest dose/times were of the order of 40 millirad in 75 minutes and 32 millirad in 40 minutes in any one day.

4. I gave the opinion that the radiation doses were within the laid down, accepted safety limits but the P.M.O. (Air Commodore McDonald) considered it would be best to get your opinion. Please may I, therefore, have your views? No panic.

Sgd. J.B. ROSS, Gp. Capt.

Sqn. Ldr. D. STURROCK, M.B., Ch. B.,
Medical Training Establishment,
Royal Air Force,
WARTON.

MEDICAL CONFIDENTIAL

LOOSE MINUTE

S.104/6/Org.

SECRET

MEMORANDUM

95567

R.A.F. Form 1150

FROM: Air Ministry, Arm.Eng.2.
Public Trustee Bldg. 6th Floor,
Stamford Street, Kingsway,
London, W.C.2.

Tel. No. TEM. 1215 Our ref. A.123802/52

Ext. 3145 Date 3.1.58.

TO: The Secretary, J.S.C.B.D.M.,
The War Office (E.S.2b.)

Copy to:- A.M.(M.A.4)
ADMIRALTY (D.U.W.M.)

Your ref. E.S.2/BM/BD/5

Dated 26 11. 57.

B.i. Etc Ruin on return

SUBJECT: Project E/BD/10 - Field Photography

1. Referring to your above quoted Memorandum and confirming telecon. of the 17th December, 1957, Harrison - Haynes spoke.

2. The overall question of the exposure of R.A.F. personnel to the various types of radiation emanating from radio-active sources has been thoroughly considered by the Air Ministry Directorate General of R.A.F. Medical Services. Air Ministry Orders setting out the limits to which R.A.F. personnel may be exposed to radiation, the responsibilities which devolve upon the R.A.F. Medical Service in connection with the use of radio-active sources in the R.A.F., etc., etc., are issued and amended as required.

3. I am to say that the present limits of exposure to radiation authorised for R.A.F. personnel are similar to those set out at Serial 1 of the Table contained in the Schedule attached to the Preliminary Draft of Regulations, Factories (Ionising Radiations) Special Regulations (Factories Acts 1937 & 1948)and, as such, the latter are acceptable to the R.A.F. Any deviation from these limits will, in so far as they are applicable to the R.A.F., be authorised by the Air Ministry (D.G.M.S.).

4. It is confirmed that, allowing for any differences between Service and Industrial Medicine, the requirements of paragraph 11 of Part 2 and paragraph 22 of Part 3 of the Preliminary Draft Regulations are adequately covered by the arrangements laid down for the R.A.F. in Air Ministry Orders. Referring to para,11 of the draft Regulations however, it is

/considered

NOTES
1.—Continue overleaf if necessary, annotating "P.T.O.".
2.—This form is normally to be completed in manuscript.
390 25/BJ/20. Wt. 39025. 100M Pads. B.& S. 51-8501.

Signature of Sender
Name in Block Letters 302
Rank/Appointment

SECRET

Aldermaston,
Nr. Reading,
Berks.

for Task Force Commander
Task Force Grapple

6th January, 1958

SECRET

considered that as B.D. personnel will only be employed occasionally in processes involving the use of radio-active sources, the issue of film badges to B.D. personnel will not be justified. This requirement will be adequately covered by the issue of a quartz-fibre dosimeter as and when required.

Signature of Sender ...E.W. Harrison.....

Name in Block Letters ...E.W. HARRISON .....

Rank/Appointment ...Head of Branch .....

SECRET

/S.104/6/Org.

of P (A)
of P (G)

From: Group Captain A. Muir, M.A., B.Sc., M.B., Ch.B., M.R.C.P.(E), D.T.M. & H.

83A

6591

2-8 RICHMOND TERRACE

Ref: C.95567/57/M.A.4

10th January 1958

Dear Rexford-Welch,

The Commander of Task Force Grapple has asked D. of P.(A) and D. of P.(G) to ensure that the following personnel are examined before leaving U.K. to ensure they have no blood diseases:-

(a) All Canberra aircrew.

(b) All technical and other personnel employed in servicing Canberra aircraft.

(c) All personnel employed on decontamination (health physics) duties.

He has also informed them that "in so far as the technical personnel posted to R.A.F. Christmas Island Establishment and the Reinforcement Party Establishment are concerned the requirement is for 25% of each trade to be examined."

Urquhart has told me that in his view only those included under (a), (b) and (c) above need be done and that the request for 25% of each trade to be included was probably decided on advice from Aldermaston.

/Would

Squadron Leader S. C. Rexford-Welch, M.R.C.S., L.R.C.P.,
A.W.R.E.,
Aldermaston,
Nr. Reading,
Berks.

6th January, 1958

for Task Force Commander
Task Force Grapple

Would you please let me know if this assumption is correct. If it is, it would be interesting to hear why this figure was chosen and also if you think it would be practicable to select 25% of those ordered to proceed. Our concern at Air Ministry is naturally that all exposed to risk will be examined but perhaps the 25% will be selected as those who are to handle the contaminated aircraft.

I hope to visit you at Aldermaston during the week beginning Monday, 20th January, if this is convenient to you. Let me know the best two days in that week and be so kind as to book accommodation for me for one night "at the local".

Best wishes for 1958.

Yours sincerely,

Adam Kane.

LOOSE MINUTE

GRA/S.104/6/Org.

D. of P (A)
D. of P (G)

Info:- D. of H. & R.

Medical Examinations - Atomic Weapons Trials
Christmas Island

1. Certain personnel forming part of a task force to assist Atomic Weapons Trials are liable to be exposed to radiation. It is necessary therefore to make sure before they leave this country that they are not suffering from any disease of the blood which might be aggravated by this exposure. No facilities are available in Christmas Island for this examination to be carried out there. It is therefore necessary for such personnel to have the examination before leaving this country.

2. The personnel concerned are the following:-

(a) All Canberra aircrew.

(b) All technical and other personnel employed in servicing Canberra aircraft.

(c) All personnel employed on Decontamination (Health Physics) duties.

3. In so far as the technical personnel posted to R.A.F. Christmas Island Establishment and the Reinforcement Party Establishment are concerned the requirement is for 25% of each trade to be examined.

4. It will be necessary for the result of the examination to be entered in the medical documents of the personnel concerned. The Posting Notice or Draft Note in each case should be annotated to show that the examination has been made

5. The attention of Medical Officers should be drawn to Air Ministry letter C.95567/57/M.A.4 dated 31st October, 1957, which gives the standards below which personnel should not be accepted for this duty.

6. It is requested that action be taken to implement the foregoing requirement.

7. The necessary instructions have been passed to the appropriate Command Headquarters and to the Record Office.

(G.W. SWANWICK)
Squadron Leader,
for Task Force Commander
Task Force Grapple

6th January, 1958

80A

3-8 Richmond Terrace,
[illegible]

W.Hab

C.955C2/57/W.Hab ✓

23 December, 1957.

Sir,

Personal Record of Exposure to Radio Activity

I am directed to enclose Army Forms A24 for Royal Air Force personnel exposed to radiation in recent operations.

2. I am to request that these forms be forwarded to the units at which the airmen are serving for inclusion in P.R.H.s.

I am, Sir,
Your obedient Servant,

for (J. W. [illegible])
Wing Commander
for Director of Hygiene and Research

The Air Officer Commanding,
R.A.F. Record Office,
Royal Air Force,
Gloucester.

V

(by Only a very limited number will be affected + these o
a few Tech officers employed on specialised duties at BWRE.
be covered easily by notifying BC who allocate cases

(79A) 76A

NOTE of RETION

DRAFT Para 10

Consultants recommendation regarding limiting of blood examination for RADIATION workers in line with PARA 11 of ICRP only RETICED for RADIOGRAPHERS in hospitals.

Not RETICED for others as doubtful of supervision & recording of dosage. Position to be reviewed in 2-3 years

20 Dec 57.

79A

LOOSE MINUTE

GRA/S.104/6/ORG.

M.A.4

Master Register of Radiation received by R.A.F. Personnel on Atomic Trials

43A

1. Reference your loose minute C.95567/57/M.A.4 dated 20th November, 1957 (received 17th December, 1957) the following is the information you require in respect of the named officer:-

Flying Officer F.G. PERRY (4089529)

2. It is regretted that no information is available on Squadron Leader N.S. Pouley. ~~as~~ This Headquarters has no record of an officer of this name having taken part in Grapple operations.

H.Q. Task Force Grapple

19 Dec 57

(G.W. SWANWICK)
Squadron Leader,
Air Log. O.

Mr P.
Please file this on Estbmdy F21.
Two others 5877748 Cpl FISKE M C. } Both
& 4166589 SAC DIXON J W } Spenlds
AWRE

196

(b) Only a very limited number will be affected & those a few Tech officers employed on special duties at AWRE. be covered easily by notifying BC who allocate Tech people for the very occasional AWRE

(c) The hazards the personnel AWRE would fall into

R.A.F. Form 1150

MEMORANDUM

FROM Wg Cdr J M URQUHART

TO Air Commodore D A WILSON

Tel. No. ..... Our ref. .....

Ext. ..... Date .....

Your ref. .....

Dated .....

SUBJECT: Consultants opinion re. DRAFT AMO.

Sir Air Commodore,

Herewith draft AMO, copy of Engrs Report + certain other papers which I have circulated. I shall send a copy of my DIRECT paper when it has been retyped

Yours

Agreed but see Recommendation of I.C.P.R.

for Chief Insp Scientific

NOTES

1.—Continue overleaf if necessary, annotating "P.T.O.".

2.—This form is normally to be completed in manuscript.

390 25/BJ/20. Wt. 39025. 100M Pads. B.& S. 51-8501.

Signature of Sender .....

Name in Block Letters .....

Rank/Appointment .....

(b) Only a very limited number will be affected + the a few Tech officers employed on special duties at RN be covered easily by notifying BC who allocates Tech people for the very occasional DURE.

(c) In practice the occasional DURE would fall in [illegible] of highly trained personnel for whom A[illegible]

CONFIDENTIAL

78A

From:- R.A.F./A.W.R.E., Aldermaston, Berks.

To:- Wg. Cdr. J.H. Urquhart, Air Ministry, M.A.4, 2-8 Richmond Terrace, London S.W.1.

Date:- 29th November, 1957.

Ref:- RAF/AWRE/S.1230

Radiation Exposure Records

1. Enclosed please find the radiation exposure records of R.A.F. personnel for Operation 'Antler'.

2. I have not been able as yet to obtain fuller information regarding the personal particulars of the personnel but will continue to try.

3. In the meantime I thought it best to forward these lists as they are.

I.R. Lindsay.

(I.R. Lindsay) Sqn. Ldr.

R.A.F./A.W.R.E.

Service No's requested 20/1/58 from Lindsay & lists returned to him

Building D29,
Aldermaston.

CONFIDENTIAL

(b) Only a very limited number will be affected & those of a few Tech officers employed on special duties at AWRE. be covered easily by notifying RC who allocate crew Tech people for the very occasional AWRE

(c) In practice the occasional AWRE would fall into the category of highly trained personnel for whom a saving

(See Para 2 of Air Cdre D. Wilson letter

NOTE OF ACTION

76A

Ref 74A-75A. Register checked. No 25R. 3-4 officers 19R-22R. No action necessary

If after CRIPPLE X received any over 25R

(a) For Non Crew "P" BC.
For other appropriate P staff
&
Air Sec. be requested to annotate personnel records "NOT TO BE employed ON duties which require exposure to RADIATION IN PEACE TIME"

(b) Register annotated that has been done

J Mayer

LOOSE MINUTE

(ISP) C 95567/57/MMP

~~Dep Sec~~ ~~Dir~~ ~~Dir~~ 3(a) fyi

1 Please see attached letter from Consultant in Radiation Medicine. You will note that he agrees with the policy which I had already given to B.C.

2 The Master Register held in this Directorate is now in being & the addition of the latest Patient Compatible X integrated data system brings some half dozen officers either up to or within a few "R" of the maximum.

3 I have given some thought to what action is now required. There are 2 alternatives each of which has got points for & against. Would you let me know which you think the choice

(a) Annotate Master Register & Notify B.C. or appropriate Officers branch and/or Min Secretary

(b) Annotate Master Register Annotate F. Med. 4. Notify Min Sec. & Record Office. Issue AMO on the subject.

4. The second (b) was my first thought but

(a) we do not wish to lay down a maximum which shall be common knowledge for peace time use which will probably be exceeded in wartime We can explain a few the reason for peace maximum of 25R but when such a level becomes generally known the majority will take it as a MAXIMUM ~~dose~~ without considering the qualification. This might be a source of major trouble in war

(b) Only a very limited number will be affected & these all divers or a few Tech officers employed on special duties at AWRE. They can be covered easily by notifying BC who allocate crews & the appropriate Tech people for the very occasional AWRE.

(c) In practice the occasional AWRE would fall into the special category of highly trained personnel for whom a saving clause has been included. (See Para 2 of Min Con D. Wilson letter)

5 Will you please advise ~~if~~ if you agree that we decide on ~~3(b)~~ 3(a) above.

MMM
13 Dec 57

From : Air Commodore D.A. Wilson, A.F.C., F.F.R., Q.H.S.

No. : [redacted]—Seum 4651

Reference CME/137/42/Med

Reference C.95567/57/M.A.

CENTRAL MEDICAL ESTABLISHMENT
POST OFFICE BOX 22
ROYAL AIR FORCE
KELVIN HOUSE
CLEVELAND STREET
LONDON, W.1.

12th December, 1957

Dear Urquhart.

Integrated Radiation Doses (Atomic Trials)

Thank you for your letter dated 10th December, 1957. I entirely agree with Dr. Lynch that for the highest integrated dose (75 rad) no allowance should be made for recovery in sampling personnel. This was the reason that I let the draft in the Maralinga Safety Regulations stand since it was extremely unlikely that aircrew would be employed again on sampling duties after three years. It was not intended really to suggest a recovery factor - at least for the Royal Air Force.

I am of the opinion, therefore, that we should stick to the "no recovery" regulation for the reasons that you laid down but add also, as you suggest, that where a particular case arises permission must be obtained from you, or your successors, and in any case of doubt or difficulty further reference should be made to the Consultant.

Thank you very much for coping with the Home Office re the Royal Observer Corps.

/I

Wing Commander J.M. Urquhart, M.B., Ch.B., D.P.H.,
Air Ministry,
2-8, Richmond Terrace,
Whitehall,
S.W.1.

time spent five 4 hour shifts exposed to radio-activity, [illegible] intake would be about 50 r, i.e. an average of 2.5 r/hr. This means, a decay, that he would probably be safe radiologically if the dose rate a beginning of each shift did not exceed 3 r/hr. A line drawn through th points on the ground giving a reading of 3 r/hr would, therefore, give a straightforward guide to the limit up to which forces could work, w

I have received this morning a letter from Ruislip asking for Form 1369 on Sqn.Ldr. Sturrock which was required to be raised on 28th October, 1957, on posting. Did you in fact do this, or do you want me to do it. Perhaps you will let Miss Lindsay know by telephone. I am enclosing the Ruislip letter.

Yours Sincerely

Denis Gibson

C.95567/57/M.A.4

69A

Precis of War Office Paper on Nuclear Radiation Hazards - Permissible Doses for Military Personnel

The final draft of this War Office paper is in C.86487/56/G.D.5. It has been agreed by the Home Office and War Office and is being issued to all Army units. A copy has been ordered for this Directorate.

2. The aim of the Paper is stated to be to provide for the purpose of exercises and studies and in the event of a nuclear attack on the United Kingdom, guidance on the protection of military forces against gamma radiation when engaged in life saving and other work in areas of radio active fall out.

3. The paper states that the wartime safe permissible dose is not more than 25R at a single exposure of a few hours not to be repeated for at least three months subject to a maximum lifetime exposure of 200R. If the exposure is spread fairly evenly over a period of several days ~~having~~ pending further M.R.C. appreciation a larger total dose can be tolerated, the intake being increased two or three fold. The Paper states that the main life saving phase is generally estimated to last two days, if a soldier during this time spends five four-hour shifts exposed to radio activity his total intake would be about 50R e.g. an average of 2.5R per hour. This means he will probably be safe if the dose rate at the beginning of each shift did not exceed 3R per hour. If it is planned that he takes his complete dose in one tour of duty e.g. 25R in four hours, this means an average of $6\frac{1}{4}$R per hour and a starting dose rate of 10R per hour. These two contours, 10R and 3R, are made the basis of all Army and Civil Defence planning. The Paper has one short paragraph stating operational necessity might arise when an integrated dose of 75 or more may have to be accepted.

be taken that, pending ... a larger total dose can be tolerated without radiation ... that the intake can be increased two or threefold. The main life ... it is generally estimated, will last about two days. If a soldier ... time spent five 4 hour shifts exposed to radio-activity, his total ... intake would be about 50 r, i.e. an average of 2.5 r/hr. This ... that he would probably be safe radiologically if the dose ... line drawn th...

69A

RESTRICTED

DRAFT OPERATIONAL PLANNING INSTRUCTION No.

Nuclear Radiation Hazards - Permissible Doses for Military Personnel

Aim

1. The aim of this planning instruction is to provide, for the purpose of exercises and studies, and in the event of a nuclear attack on the United Kingdom, guidance on the protection of military forces against gamma-radiation when engaged in life saving and other work in areas of radio-active fall-out.

Policy

2. In the event of thermo-nuclear attack the Army's task will be to support the Civil Authorities. The Army's ability to meet any conventional threat that might follow such an attack will be directly dependent upon the degree to which the country as a whole has survived such an attack. It will therefore be essential for the Army to give the Civil Authorities the maximum possible support. The only limitation to be placed on that support will be the degree to which commanders will be prepared to accept casualties caused by gamma-radiation or other hazards. This will be a matter for judgement by commanders in the event according to the circumstances. The following paragraphs state the radiation dosage that can be accepted without serious risk and describe various ways in which that dosage can be accumulated.

Permissible Dose Rates

3. The Government has recently issued a manual of Civil Defence setting out a provisional scheme of public control in conditions of radioactive fall-out.+ Account has been taken of the principles set out in that manual, and they have been applied to the conduct of military life saving and other operations in the damaged area; account has also been taken of the likely trend of Civil Defence Corps instructions to be issued on this subject.

4. The wartime safe permissible dose is not more than 25 r at a single exposure of a few hours, not to be repeated for at least three months, subject to a maximum life-time exposure of 200 r. If the radiation is absorbed in a number of exposures spread fairly evenly over a period of several days, it can be taken that, pending a further appreciation by the Medical Research Council, a larger total dose can be tolerated without radiation sickness developing, so that the intake can be increased two or threefold. The main life-saving phase, it is generally estimated, will last about two days. If a soldier during that time spent five 4 hour shifts exposed to radio-activity, his total permissible intake would be about 50 r, i.e. an average of 2.5 r/hr. This means, allowing for decay, that he would probably be safe radiologically if the dose rate at the beginning of each shift did not exceed 3 r/hr. A line drawn through the various points on the ground giving a reading of 3 r/hr would, therefore, give a simple and straightforward guide to the limit up to which forces could work, without undue risk, in shifts for a period as long as they are likely to be wanted or capable of carrying on without withdrawal for rest. The 3 r/hr line will, because of decay, contract inwards towards the centre of damage, thus continually opening up new areas for operations.

5. There may be circumstances, however, where it would be intolerable to restrict operations to areas where the dose-rate was below 3 r/hr. In such cases it would be possible to allow the whole of the permissible dose of 25 r to be taken in one shift of about 4 hours. This would mean an average dose-rate of 6¼ r/hr. Allowing again for decay, the starting rate could be somewhat higher than that average, the precise excess depending on the time after burst. For simplicity the starting rate can be taken at 10 r/hr, this rate being the inner limit for urgent operations by forces who are to work one shift only.

/6.....

+Manual of Civil Defence, Vol 1, Pamphlet No. 2 - Radioactive Fall-out.

6. Operational necessity might arise where an integrated dose of 75 r or more may have to be accepted.

Equipment

7. It is appreciated that in order to control dose rates in the way described above it will be necessary to equip each individual or group of individuals with a personal dosimeter in order to check his or their own radiological safety, and, in addition, every organised unit or sub-unit with a survey meter.

B44. 21/11

COPY

CONFIDENTIAL

67A

C.95567/57/M.A.4

LOOSE MINUTE

D. of H. and R.

Integrated Radiation Doses - Atomic Trials

You may remember that some months ago the question of the total integrated doses which could be allowed for R.A.F. personnel employed on atomic trials was raised by Ops.(A.W.T.) and Bomber Command. At that time I consulted Dr. Lynch, the Principal Medical Officer, A.W.R.E., who gave a ruling that for service personnel who were not normally exposed to radiation the maximum ~~was~~ 75R, of which not more than 25R. should be gamma, was the limit and that no allowance could be made for recovery. I circulated this as our official policy to Bomber Command and Ops. (A.W.T.).

2. I have now received a record of certain integrated radiation doses following Antler from the Health Physics Group at A.W.R.E. and find that their regulations are at variance with this decision. They lay down that the maximum shall be a special higher integrated dose of up to 75R of which gamma radiation components must not exceed 25R, which is in agreement with the above, but they then go on to state that personnel who have received this dose will not be subjected to further exposure during a period of three years. You will see therefore that they do allow for recovery.

3. I should like a ruling on which of these two alternatives shall be Air Ministry policy. My own view is that we should stick to our first statement that we do not take any account of recovery times for the following reasons:

(a) The degree of recovery varies with circumstances and is still scientifically somewhat uncertain.

(b) The numbers of personnel at risk are not large and 99 times out of 100 it should not be impossible to find some other person of equivalent rank and training who can do the job starting with a clean radiation sheet.

/(c)

CONFIDENTIAL

by the [illegible]
in F Med 29 (Central Medical [illegible]

(b) Special health register. In addition to the above docu
each A.D.P. will keep a special register in which will b
each successive blood examination.

7. Medical officers and A.D.Ps. will scrutinise the reports on the
examinations, and their subsequent action will be guided by the fol
standards:-

(c) The whole field of radiation damage with particular reference to the genetic effects is still so uncertain that where we can provide alternative personnel we are not justified in increasing the maximum dose to above 25R.

4. In the event of the very occasional specially trained man being required to exceed this dose, I am thinking in particular of officers seconded to A.W.R.E. for special duties, we could add a rider that, with your authority, the dose might be exceeded.

(J. M. URQUHART)
Wing Commander

M.A.4
29.11.57

COPY

Wing Commander J. M. Urquhart, M.B., Ch.B., D.P.H.

Trafalgar 8811
=== 6668

2-8 RICHMOND TERRACE

66A

Ref: C.95567/57/M.A.4

29th November 1957

Dear

We discussed some time ago the question of my exposure to radiation in September 1956 and whether it would be worth my sitting under your machines to check the existing position. I have been looking up the original records and the following details may be of value in deciding whether any whole body readings at this stage would give results.

I was exposed to mixed fision products by inhalation from F + 5 hours 30 minutes to F + 12 hours 10 minutes. 18 hours later my thyroid gave a reading showing content 1.87 x 10 microcuries and at 60 hours 0.161 microcuries.

I go to the Staff College on the 14th January and thereafter will not be available but I shall be in the Abingdon area until then. If you are interested you might get in touch with me either at the above telephone number or at Drayton 13 in the evenings when we can arrange a time.

Hoping everything went successfully and that your wife has now recovered.

Yours

J. Rundo, Esq.,
Health Physics Group,
A.E.R.E.,
Harwell,
Near Didcot, Berks.

by the [illegible]
in F Med 29 (Central [illegible]

(b) Special health register. In addition to the a
each A.D.P. will keep a special register in whi
successive blood examination.

COPY

163A

2-8, RICHMOND TERRACE,

M.A.4

59726/53/M.A.4

24 June, 1957.

Sir,

Medical Examination of Personnel exposed to Sources of Radioactivity

I am directed to refer to your letter AHQM/C510/6/Med. dated 6th June, 1957, and to state that the relevant R.A.F. regulations are contained in A.M.O's. A.51/53 (at present under revision), A.91/53, and A.18/55.

2. I am to state that the documentation of special medical examinations and of blood examinations is to be carried out as for other such examination, the disposal of card and flimsy form being in no way altered.

3. I am to add that where exposure to radiation is in excess of the limit as recorded or when routine blood examination fall below the levels laid down a short report on the circumstances and the action taken is to be forwarded to the competent medical authority with a copy to Air Ministry (Director of Hygiene and Research).

I am, Sir,
Your obedient Servant,

(J. M. URQUHART)
Wing Commander
for Director of Hygiene and Reserch

Senior Medical Officer,
Air Headquarters,
Royal Air Force,
British Forces P.O. 51
Malta.

through the ... by the Director of Pathology.
in F Med 29 (Central medical envelope).

(b) Special health register. In addition to the above do ... special register in which will

COPY

162/A
63A

A.169726/53 /M.A.4

Loose Minute

M.A.2.

Copy to:- D.3/M.A.4

Joint Services Medical Documentation
Recording of Radiation Dose to Personnel

1. Reference your memorandum dated 30th May, 1957, on the above subject herewith the information you require:-

IN PEACE

(a) Radiac Training Sources (A.M.O.A.51/53 at present under review) (A.91/53)
Radio-Active sources in aircraft instruments (A.M.O. A.18/55)

Recorded on A.20 and A.21 Army Forms (If made F.Med. we should like to be consulted)

A.20 Only used for (i) those regularly at risk e.g.:-
Instructors
Storemen
Instrument repairer etc.

(ii) Trainees only when they receive radiation as recorded on G.F. dosimeter in excess of half maximum permissible daily dose (at present 50 milliroentgen/ diem)

/Recorded

through the ...-
by the Director of Pathology.
in F Med 29 (Central medical envelope).

filed by AM

(b) Special health register. In addition to the above documen
each A.D.P. will keep a special register in which will be
each successive blood examination.

Recorded on this form immediately ~~on~~ dosimeter read (e.g. in section ~~one~~ where A.20 must be filed)

(i) Date and time of exposure

(ii) Dosimeter reading received

Form sent to Unit M.O. once a week.

A.21. Medical Confidential, kept solely by M.O., enclosed in F.Med.4. made up once a week from A.20 or as necessary,

Recorded on this form

(a) Weekly total dose
(b) Date of medicals
(c) Blood examination
(d) Dates of any periods of suspension from duty with R/A. sources

(b) ATOMIC TRIALS In process of compilation from A.W.R.E. records.
A.21. Completed from A.W.R.E. Records and enclosed in F.Med.4. Master Record held in D. of H. & R.

IN WAR

No arrangements agreed at present. Awaiting discussion

(J. M. URQUHART)
Wing Commander

M.A.4.
24/6/57
HRC.

AHQM/C.510/6/Med.

Air Headquarters,
Royal Air Force,
Valetta,
B.F.P.O. 51

6th June, 1957.

Sir,

Medical Examination of Personnel
Exposed to Sources of Radioactivity

I have the honour to refer to the attached copy of a letter received from D.D.M.S. H.Q. Troops Malta with a copy of War Office Memo 24/Gen/3774 (AMD 7) dated 28th May, 1952.

2. It is requested that this Headquarters may be informed of any policy or directive which may have been issued on the above subject.

I have the honour to be,

Sir,

Your obedient Servant,

E.S. Odbert

(E.S. ODBERT)
Wing Commander
for Air Officer Commanding
Royal Air Force, MALTA

The Under-Secretary of State,
Air Ministry D. of M. and R.,
2 - 8 Richmond Terrace,
Whitehall, London

through the ...
by the Director of Pathology.
in F Med 29 (Central medical envelope).

(b) Special health register. In addition to the abo
each A.D.P. will keep a special register in which

C O P Y

(1613)

Headquarters
Troops, Malta
B.F.P.O. 51

Tel No CAS 59
CRM/1020/M8

23rd May, 1957.

Group Medical Officer RAF.

Subject:- Medical Examination of Personnel exposed to sources of radioactivity

Ref encl copy of Appx 'A' to War Office Memo 24/Gen/3774(AMD 7) dated 28 May 52.

1. The Specialist in Pathology, DBMH, would like to know what action should be taken in respect of RAF personnel, with particular reference to para 6(a) of this Memorandum.

2. Kindly advise us.

(M.M. LEWIS) Lt Col RAMC,
for Col DMS HQ Troops MALTA

/MM

inclusion in F Med 4 (Medical envelope). The card copy will through the A.D.P. Command to the War Office (AMD 8) for insp by the Director of Pathology. It will then be filed by AMD in F Med 29 (Central medical envelope).

(b) Special health register. In addition to the above documents

COPY

APPENDIX 'A' to W.O.M.
24/Gen/3774/(AMD 7) dated
28th May, 1952.

INSTRUCTIONS FOR THE MEDICAL EXAMINATION OF PERSONNEL EXPOSED TO SOURCES OF RADIOACTIVITY

1. In all depots where personnel work regularly with radioactive sources a medical officer will be appointed to supervise the medical arrangements for the prevention or detection of over-exposure to radiation.

2. This medical officer will make a weekly inspection of the unit's record of the doses of radiation received to ensure that no individual is subjected to doses of radiation exceeding 0.3 ROTGEN DURING ANY ONE WEEK. When a total dose of more than 0.3 roetgen is received in one week he will report this to the D.D.M.S. Command through normal channels.

3. All personnel working regularly with radioactive sources will have an initial medical examination, which will include the red cell count, the packed cell volume, the haemoglobin percentage, the total white cell count and a differential count of absolute numbers and not as percentages, and a note will be made as to the frequency or absence of abnormal cells.

4. No person will be employed on duties entailing exposure to radiation whose general health or the state of whose blood is unsatisfactory. If two total white cell counts and lymphocyte counts are below the lower limits of the average normal (see para. 7), the individual will not be permitted to take up such duties.

5. While continuously employed on such duties the examinations mentioned in para 3 will be carried out every six months. These blood examinations on a group of individuals in the same unit should, preferably, be carried out by the same person each time so as to ensure a uniform and comparable technique.

6. Documentation

(a) F Med 12 (Request for special examination) will be initiated by the officer responsible for supervision of the individual's medical condition. When the examination has been carried out, Part 2 of F Med 12 will be completed by the pathologist who will also arrange for a copy or extract to be typed on F Med 7 Outpatient record. The flimsy copy of F Med 7 will be sent to the individual's unit for inclusion in F Med 4 (Medical envelope). The card copy will be sent through the A.D.P. Command to the War Office (AMD 8) for inspection by the Director of Pathology. It will then be filed by AMD Stats in F Med 29 (Central medical envelope).

(b) Special health register. In addition to the above documentation, each A.D.P. will keep a special register in which will be recorded each successive blood examination.

7. Medical officers and A.D.Ps. will scrutinise the reports on the blood examinations, and their subsequent action will be guided by the following standards:-

	Total W.B.C.	Total PMNs.	Total lymphs	Abnormal cells
Average normal	4500-12100	2250-8200	1100-3800	Nil
Warning level	4500	3000	1000	Nil
Rejection level	3000	2000	750	Present

/Cont.

It should be noted that, even within the range of 'average normal' a decided and progressive drop in either the total leucocyte of the lymphocyte count should be considered a warning. Should any worker with radioactive sources show a fall in his white blood cell count to the 'warning' level, a progressive fall in successive counts, development of anaemia or general ill-health, he will be admitted to hospital forthwith for investigation.

24/Gen/3774 (AMD 7).

A.49/27/5.

Loose Minute

M.A.7/41

G.D.5.

Copy to:- D.D. of H. & R.

Forms for recording Radiation Exposure

The forms which you forwarded with your loose minute C.56350/53 of 28th March, 1956, seem quite suitable.

2. They are, however, so little different from the Army Form that there seems to be excellent reason for standardising on a joint form, as has already been suggested to me by the Army.

3. This would only entail a few alternative headings - e.g.
"Service/personal number"
"Initials medical/ABC office" etc.

4. I would, however, question whether the Personal Record Card need be Confidential; it does not really make any serious personal revelations (which would justify the medical category of Personal and Confidential), nor does it seem to reveal any service secrets.

all med forms should be confidential. Blood counts abnormal cells usually are confidential

Wing Commander
(J.D. TONKINSON)

M.A.7.
2/5/56.
JB

Spoke MAT 3/5/56. They will cancel above minute

MAC. Have you told MAT that I want to talk to him about this. It is important that we speak the same language on this subject. MAC is away today.

3/5/56

1578

Re: 15/AT/8

LOOSE MINUTE

C.56380/53

M.A.7
Copy to: D.D. of H. & R. ✓

Forms for Recording Radiation Exposures

1. I am forwarding to you a draft Air Ministry Order on the regulations for "The Use, Storage and Transportation of Radio-active Sources issued for Passive Defence Training". The medical paragraphs in this order were written by D.D. of H. & R. You will see in paragraphs 39 and 40, dealing with documentation, that records of exposure to radiation are required to be kept on Army Forms A.20 and A.21. The Royal Air Force has not as yet provisioned these forms, in any quantity, and as, in any case, they require slight amendment to suit our purposes, it is proposed to replace them by suitable R.A.F. forms, and amend the A.M.O. accordingly.

2. Will you please examine the amended forms which are attached and, in the light of the requirements of the draft Air Ministry Order, give your approval to their design so that printing action may be taken.

E J B Brown

(E. J. B. BROWN)
Wing Commander

G.D.5
28.3.56

1094

Individual Dosimeter Registered Number (d)

CONFIDENTIAL.

RECORD OF BLOOD EXAMINATION

(For Medical Officer's use only)

No.	Date	Hb	Rbc	PCV	Wbc	POLYS	Lymphs	Mons	EOS	BAS	Abnormal Cells

E&D

CONFIDENTIAL

RAF
Army Form ~~A81~~

PERSONAL RECORD OF EXPOSURE TO RADIO ACTIVITY

Surname

Christian or Fore Name(s)

Unit / wing

Radiac Duties Commenced / /195

Rank or ~~Grade~~

Station

Service ~~Army or Clock~~ No.

Routine of Medical Examinations						Periods of Suspension due to Excess Dosage			
No.	Date	Officer's Initials	No.	Date	Officer's Initials	From	To	From	To
1			4						
2			5						
3			6						

Weekly Totals — Dosimeter Readings (from Col.(s) — ~~Army~~ RAF Form A20)

Week Commencing	Reading	Initials Medical Officer	Week Commencing	Reading	Initials Medical Officer	Week Commencing	Reading	Initials Medical Officer

(2123) Wt.25693/4546 6m 11/53 Gp.697 G.B.&Co.Ltd.

WEEKLY RECORD OF INDIVIDUAL DOSIMETER READINGS

223 Unit / Wing ..... Station ..... Week Commencing 195

Service Identification Number	Rank Gender	Name	Individual Dosimeter Registered Number	DAILY READING & CUMULATIVE TOTAL FOR PREVIOUS 7 DAYS														Initials Officer	Initials Medical Officer
				Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday			
				Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)

Unit Wing

WEEKLY RECORD OF INDIVIDUAL DOSIMETER READINGS

RAF
Army Form

195

Service Identification Number	Rank or Grade	Name	Individual Dosimeter Registered Number	DAILY READING & CUMULATIVE TOTAL FOR PREVIOUS 7 DAYS														Initials RADAC Officer	Initials Medical Officer
				Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday			
				Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total	Day's Reading	Cum. Total		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)

11.500 7 - 1

RESTRICTED
Not to be communicated to anyone outside H.M. Service

A.46 to A.56
1953

AIR MINISTRY ORDERS

CLASS A. STANDING ORDERS

AIR MINISTRY,
19*th February*, 1953

The following Orders are hereby promulgated for information and guidance and necessary action.

By Command of the Air Council,

J. H. Barnes.

RESTRICTED

Medical Control within the R.A.F.

3. We give special medical supervision to pers

I. PERSONNEL—R.A.F. AND W.R.A.F.

A.46.—LEAVE OF AIR FORCE PERSONNEL

[A.998938/49/S.10(a).—19th February, 1953.]

1. Consideration has been given to the position of officers holding permanent commissions who are retired compulsorily by reason of age or absence of suitable employment, following service in an appointment abroad during which they were not entitled to leave in the United Kingdom at public expense.

2. In future the officers concerned will be granted 56 days terminal leave, instead of 28 days, as an alternative to premature return to the United Kingdom. It is emphasized that this concession is limited to the class of officer described in para. 1 above, and will only apply when they return to the United Kingdom for direct retirement. The position of other officers and regular airmen is not affected by this order.

3. For amendments to A.M.O. A.653/49 *see* A.M.O. A.56/53 and Supplement.

A.47.—RE-ENLISTMENT, EXTENSION, AND RE-ENGAGEMENT BOUNTY SCHEMES

[A.82281/51/S.10(a).—19th February, 1953.]

(*This order replaces A.M.Os. A.629/50, A.642/50, and A.91/52, as amended.*)

PART I—INTRODUCTION

1. As already notified in Air Ministry signals P.4648 and P.4650, dated 24th December, 1952, the re-enlistment, extension, and re-engagement bounty schemes announced, respectively, in A.M.Os. A.642/50, A.91/52, and, A.629/50, as amended, are being continued until 31st December, 1953.

2. Some improvements in all three schemes have been introduced. Full details of the revised schemes, which supersede those contained in A.M.O. A.629/50, A.642/50, and A.91/52, as amended, are set out below and apply generally to airmen who re-enlist, extend their service, or re-engage on or after 1st January, 1953 (*but see* para. 15 below). The changes are as follows :—

(*a*) *Re-enlistment Bounty Scheme.*

(i) Airmen who were discharged or transferred to the Reserve before 1st January, 1953, are now eligible instead of only those who left the Service before 1st September, 1950 [*see* para. 3, sub-para. (*b*), below].

(ii) An airman who formerly served on a bounty engagement is now eligible if he re-enlists on an engagement for ten or twelve years regular service [*see* para. 3, sub-para. (*d*), below].

(iii) The requirement that an airman must not have had a break of more than four years in whole-time service is abolished.

(iv) Administrative orderlies will not be eligible for re-enlistment bounty [*see* para. 3, sub-para. (*f*), below].

(*b*) *Extension Bounty.* The requirement that airmen must have been serving on a regular engagement on 7th February, 1952, is abolished.

(*c*) *Re-engagement Bounty.*

(i) The requirement that airmen must have served without a break, on a regular engagement, since 1st September, 1950, is abolished.

(ii) £75 of the £100 re-engagement bounty will be paid immediately the airman is re-engaged (*see* para. 13 below). The remaining £25 will be paid on the date on which the airman begins the thirteenth year of service reckonable for pension.

(iii) The concession mentioned in sub-para. (ii) above will be extended to airmen who have already qualified for re-engagement bounty (*see* para. 15 below).

within the R.A.F.

PART II—RE-ENLISTMENT BOUNTY SCHEME

3. **Conditions of Eligibility.** To be eligible for enlistment under the re-enlistment bounty scheme an ex-airman must—

(*a*) have previously completed a minimum of two years whole-time service ;

(*b*) have been discharged, or transferred to the Reserve, before 1st January, 1953 ;

(*c*) be medically fit for the duties of his trade or aircrew category in any part of the world ;

(*d*) if he formerly served on a bounty engagement under the provisions of A.M.O. A.445/46, as amended, or A.553/48, as amended (both orders since cancelled), enlist on an engagement for ten or twelve years regular service ;

(*e*) not be in receipt of a disability or service pension ;

(*f*) if a tradesman, be qualified, by virtue of his former trade mustering, for entry to a skilled or advanced trade in which there are suitable vacancies, or be able to pass a trade test for direct entry to such a trade (An airman who re-enlists as an administrative orderly will not be eligible for this bounty.) ; and

(*g*) if an airman (aircrew), have been awarded his flying badge before he was discharged or transferred to the Reserve, provided there are vacancies for airmen (aircrew) in his category.

4. **Periods of Engagement.** Subject to the provisions of para. 3, sub-para. (*d*), above, ex-airmen will be required to re-enlist for one of the standard periods which are as follows :—

(*a*) *For Ground Tradesmen.*

(i) Five years regular service followed by four years service in Class E of the Reserve.

(ii) Ten years regular service followed by two years service in Class E of the Reserve.

(iii) Twelve years regular service.

Note. For musicians the periods are five, ten, or twelve years regular service only.

(*b*) *For Aircrew.*

(i) Pilots, navigators, signallers, and engineers . . . eight years regular service followed by four years service in Class E of the Reserve.

(ii) Gunners . . . five years regular service followed by four years service in Class E of the Reserve.

5. **Rank on Re-enlistment.** Ex-airmen accepted under the provisions of this scheme will be re-enlisted in the rank of aircraftman 2. Those who are re-enlisted as ground tradesmen will be immediately promoted to any higher rank, including technician rank, for which they are eligible, and will be informed of the rank they can be offered before enlistment. Ex-aircrew will be promoted to the rank of sergeant immediately, regardless of their former aircrew rank, and their subsequent promotion will be as laid down in para. 6 of A.M.O. A.545/50, as amended.

6. **Re-enlistment Bounty.** Ex-airmen re-enlisted under the provisions of this scheme will be paid a tax-free bounty of £50, £20 of which will be paid immediately on re-enlistment and the balance of £30 on the completion of three months service on the new enagement. The bounty will not have to be refunded if airmen subsequently extend their service or re-engage, or be deducted from any extension or re-engagement bounty for which the airman may subsequently qualify.

PART III—EXTENSION BOUNTY SCHEME

7. A tax-free extension bounty of £50 will, except as provided in paras. 8 and 9 below, be payable to airmen [excluding airmen (aircrew) and boy entrants while classified as such] serving on regular engagements who apply under the terms of A.M.O. A.779/50, as amended, to extend that engagement to one of twelve years regular service, and whose extensions of service are promulgated before the end of 1953.

8. The extension bounty will be payable on the date on which the regular portion of the airman's engagement would have expired had he not extended his service. When the regular portion of the airman's engagement has already been completed, payment will be authorized immediately the extension of service has been promulgated. As stated in paras. 18 and 19 of A.M.O. A.709/50, as amended, the extension of service of M.T. drivers is conditional upon their qualifying as M.T. driver mechanics or M.T. fitters (servicing), as appropriate, when called upon to do so ; for such airmen, payment of the extension bounty will also be conditional upon their qualifying for transfer.

9. Airmen serving on engagements under the terms of A.M.O. A.445/46, as amended (since cancelled), who extend their engagement to twelve years regular service, will be eligible for the special gratuity of £25 under the provisions of para. 32 of that order, as well as the extension bounty under the terms of this order. Those airmen who have completed their engagement under the terms of A.M.O. A.445/46, as amended, and have been paid their terminal gratuity, although retained in the Service under the provisions of A.M.O. N.360/52, are not eligible for the extension bounty. The extension bounty will not be payable to airmen who at the end of their engagement will complete 22 or more years total service reckonable for pension.

10. The extension bounty is in the nature of an advance, and, except for an airman who is invalided, will be deducted from whatever terminal gratuity, re-engagement bounty, or terminal grant, may first become payable at any later date.

PART IV—RE-ENGAGEMENT BOUNTY SCHEME

11. A tax-free bounty of £100 will be payable to any airman (including an airman mustered as aircrew) who is serving on the Active List portion of a regular engagement of twelve years or less (provided he would not complete 22 or more years service reckonable for pension by the end of that engagement), and who, before the end of 1953, is re-engaged to complete either 22 years service under the terms of A.M.O. A.335/49, as amended, or to the age of 55 under the terms of A.M.O. A.327/51, as amended.

12. Certain airmen are eligible for re-engagement under the terms of the orders mentioned in para. 11 above, although their service on a current regular engagement may have been prolonged for rather more than twelve years, under, for example, the provisions of A.M.O. A.445/46, as amended, or A.705/49 (both orders since cancelled). Such airmen will also be eligible for the re-engagement bounty, provided they are re-engaged within the prescribed period and, by so doing, will be undertaking normally to serve for at least a further ten years from the date their re-engagement is authorized by the Air Officer Commanding, R.A.F. Record Office. The name of any airman in this category who cannot complete ten years further service by re-engaging is to be submitted to the Air Ministry (P.3) who will decide whether or not he will be eligible for the re-engagement bounty.

13. **Date of Payment.** £75 of the re-engagement bounty will be payable immediately the airman's re-engagement is promulgated in personnel occurrence reports. The balance of £25 will be paid on the date on which the airman begins the thirteenth year of service reckonable for pension. Where the airman has already been paid the extension bounty of £50 under the terms of A.M.O. A.91/52, as amended, or part III of this order, £25 instead of £75 will be payable on re-engagement, as the extension

bounty is an advance of re-engagement bounty. If the airman has qualified for the extension bounty, but this is not due to be paid before promulgation of the date of the re-engagement in personnel occurrence reports, the £75 will be paid in full at that date; the extension bounty will not then be paid. (*See* para. 16 below, however, about payment of re-engagement bounty to M.T. drivers.)

14. For the airmen referred to in para. 13 above, who have already completed twelve years service, the re-engagement bounty will be payable in full immediately their re-engagement is promulgated.

15. Airmen who have already qualified for re-engagement bounty under the provisions of A.M.O. A.629/50, as amended, and have not already been paid the bounty will be eligible for immediate payment of £75 under the terms of para. 13 above. Individual authorities for payment will be issued by the Air Officer Commanding, R.A.F. Record Office, as soon as possible.

16. In accordance with paras. 18 and 19 of A.M.O. A.709/50, as amended, the re-engagement of certain M.T. drivers is conditional upon their qualifying as M.T. driver mechanics or M.T. fitters (servicing), as appropriate, when called upon to do so; for such airmen, payment of the re-engagement bounty will also be conditional upon their qualifying for transfer.

PART V.—GENERAL

17. When notifying C.Os. that an airman's extension of service or re-engagement has been approved, the Air Officer Commanding, R.A.F. Record Office, will also state whether there is an entitlement to a bounty payment and, if so, when the payment or payments will become due. The C.O. is to inform the airman accordingly, and is to arrange for a suitable note to be made on R.A.F. Form 678 (in the space immediately below the record of ground defence training).

18. Neither the extension bounty nor any part of the re-enlistment or re-engagement bounties is to be paid until written authority is received from the Air Officer Commanding, R.A.F. Record Office. The letter of authorization will bear the authenticating stamp of that office and will not be valid without it. The letter will give details of the annotations to be made on the airman's R.A.F. Form 280.

19. Airmen should be advised and assisted to invest in National Savings any amount of bounty that is surplus to their immediate needs.

20. When an airman is due to refund, or is refunding, by deductions from pay, any terminal gratuity (including terminal gratuity under the provisions of A.M.O. A. 445/46, as amended) previously received, he will be required to accept the offset, in whole or in part, of any bounty received under this order against the outstanding balance owed.

21. An airman who receives re-enlistment, extension, or re-engagement bounty, and subsequently wishes to purchase his discharge under the provisions of A.M.O. A.675/49, as amended, will be required normally to refund the bounty, or any lesser sum that may be determined by the Air Ministry. In fixing a lesser amount, the Air Ministry will take into consideration the amount of service given since extension of service, as well as any compassionate or other circumstances.

22. In view of exchange control restrictions, the payment of any bounty to an airman serving outside the scheduled territories (*i.e.* outside the sterling area) is not to be made locally unless the airman authorizes, at the time of payment, the remittance of the bounty, by R.A.F. Form 889 procedure, to a post office savings or other banking account in the United Kingdom or to a nominee in the United Kingdom.

23. The provisions of this order do not apply to locally enlisted personnel abroad. The position concerning airwomen is still under consideration.

PART VI—SPECIAL PROVISIONS FOR AIRMEN SERVING ON EXTENDED SERVICE BOUNTY ENGAGEMENTS UNDER THE TERMS OF A.M.O. A.445/46, AS AMENDED (SINCE CANCELLED)

24. Airmen who are serving on engagements under the terms of A.M.O. A.445/46, as amended (since cancelled), and who, during the currency of their engagements under the terms of that order, extend their service or are re-engaged in accordance with current regulations, will continue to be eligible for a special gratuity of £25 on the day when their engagements under the provisions of A.M.O. A.445/46, as amended, would have expired, in addition to any extension or re-engagement bounty for which they may qualify under the terms of parts III and IV of this order.

25. Airmen on extended service bounty engagements under the terms of A.M.O. A.445/46, as amended, who extend their service as detailed in para. 24 above, will, on discharge, or transfer to the Reserve, be eligible for normal service gratuity at the rates and under the conditions laid down in A.M.O. A.101/52. If airmen on extended service bounty engagements re-engage with a view to pension as detailed in para. 24 above, their service under the terms of A.M.O. A.445/46, as amended, and any other previous service (*e.g.*, war-time service) will be reckonable for pension, subject to the conditions of A.M.O. A.101/52.

26. If an airman on an engagement under the terms of A.M.O. A.445/46, as amended, does not wish to extend his service or to re-engage in accordance with para. 24 above, he may, on the termination of his extended service bounty engagement, be allowed immediately to re-enlist on an engagement for five years regular service followed by four years reserve service. Such an airman will be eligible to receive full terminal benefits (including gratuity) under the provisions of A.M.O. A.445/46, as amended, but he will not be eligible for the re-enlistment bounty mentioned in part II of this order, nor for the £25 special gratuity mentioned in para. 24 above. On completion of his new engagement all his continuous service will be counted for the purpose of reckoning normal service gratuity under the terms of A.M.O. A.101/52, but the amount of his service gratuity will be abated by the amount of the terminal gratuity previously received under the extended service bounty scheme.

(*A.M.O. A.629/50 and amending orders A.198/51, A.331/51, A.418/51, A.480/51, and A.92/52, A.M.O. A.642/50, and amending orders A.687/50, A.742/50, A.199/51, A.479/51, and A.93/52, and A.M.O. A.91/52 and amending order A.150/52, cancelled.*)

II. PERSONNEL—CIVILIAN

A.48.—INDUSTRIAL EMPLOYEES AT AIR MINISTRY ESTABLISHMENTS AT HOME—GRANT OF SPECIAL LEAVE WITH PAY ON MARRIAGE

[Y.43460/52/S.3(d).—19th February, 1953.]

(*This order affects A.P. 826.*)

1. The Joint Co-ordinating Committee for Government Industrial Establishments has agreed that, with effect from 1st March, 1953, special leave with pay, within the undermentioned limits, may be granted to industrial employees on the occasion of their marriage :—

(*a*) For established employees . . up to five days (for those working a five-day week) or six days (for those working a six-day week).

(*b*) For unestablished employees . . up to three days.

2. Where women employees are concerned, only those whose services it is intended to retain after marriage will be eligible for special leave with pay.

3. A.P. 826 will be amended in due course.

A.49.—INDUSTRIAL EMPLOYEES AT AIR MINISTRY ESTABLISHMENTS AT HOME—GRANT OF SPECIAL LEAVE WITH PAY FOR BEREAVEMENT

[A.966904/48/S.3(d).—19th February, 1953.]

(*This order affects A.P. 826.*)

1. The Joint Co-ordinating Committee for Government Industrial Establishments has agreed that, with effect from 1st March, 1953, industrial employees may normally be granted up to three days special leave, with pay, for absences necessitated by family bereavement.

2. This leave may be granted to an employee on the death of a husband or wife, mother or father (or person standing in the place of a parent), son or daughter, or brother or sister.

3. When the C.O. or head of establishment is satisfied that there is special hardship, the period of paid leave granted under the provisions of para. 1 above may, with the prior sanction of the Air Ministry, be extended within a maximum inclusive total of five days (for employees working a five-day week) or six days (for employees working a six-day week).

4. This order supersedes the instructions contained in para. 139 of A.P. 826 (5th Edition), which will be amended in due course.

A.50.—CIVILIAN INDUSTRIAL EMPLOYEES AT R.A.F. AND A.M.W.D. ESTABLISHMENTS AT HOME—REVISED RATES OF PAY FOR LEADING STOREMEN

[Y.46777/53/S.3(a).—19th February, 1953.]

1. Following an award of the Industrial Court, the " lead " rate payable to civilian leading storemen at R.A.F. and A.M.W.D. establishments at home is to be increased from 15*s.* 0*d.* to 18*s.* 0*d.* a week, with effect, for all pay purposes, from the beginning of the pay week containing the date of this order.

2. In addition, with effect from the beginning of the pay week containing 27th June, 1952, up to the date of operation of the revised rates for all pay purposes, each adult male employee of the grade concerned will be paid a flat amount represented by the difference between the old and new " leads ". Payment is to be made irrespective of the hours actually worked, *i.e.*, no account is to be taken of overtime, shift working, sick leave, or other approved absences, whether paid or unpaid, *provided that the employee was borne continuously on the books of the establishment and received either wages or sick pay for any period since the beginning of the pay week containing 27th June, 1952.* Employees engaged since that date are to be paid arrears appropriate to their period of employment.

3. Any case of doubt or difficulty is to be referred to the Air Ministry [S.3(a)] for decision.

IV. ORGANIZATION

A.51.—INSTRUCTIONS FOR THE STORAGE AND USE OF RADIO-ACTIVE SOURCES ISSUED FOR PASSIVE DEFENCE TRAINING

(C.50118/52/D.G.D.—19th February, 1953.)

General.

1. Radio-active sources are shortly to be introduced into the Royal Air Force so that personnel may be trained to operate radiac equipment, and exercised in defence against the radiation effects of atomic weapons.

2. Radio-active sources emit continously a flow of invisible penetrating radiations. These radiations cannot be detected by the ordinary senses, and, in quantity, are injurious. Small doses however may be tolerated by the body without harmful effect ;

their intensity is reduced by distance and by the interspersion of screens of some dense material, such as lead, closely packed earth, etc.

Radio-Active Sources—Description.

3. Radio-active sources consist of capsules containing radio-active material, carrying rods, and containers in which the carrying rods and capsules are stored.

4. The container and the carrying rod are marked with an identification letter according to the capsule concerned. Where radio-active sources, types A, C, and D are concerned, the capsule is attached to the carrying rod and is painted RED. For the radio-active source type B, several capsules, each attached to its own carrying rod, are contained in a single container which is painted RED.

Storage.

5. The following instructions refer only to the storage of radio-active sources issued to units for training purposes. Instructions regarding the bulk storage and transportation of radio-active materials other than those issued for training will be the subject of a separate Air Ministry Order to be issued later.

6. Each radio-active source is to be stored in its correct container and is to remain there when not in use.

7. Radio-active sources in their containers are to be stored in a building—or, when numbers permit, in a large petrol or oil drum sunk into the ground and adequately covered—in such a way that the radiation at all points immediately outside the selected store when closed does not exceed a rate of 100 milliroentgen for 24 hours. The store is to be kept closed and locked.

8. The selected store is to be marked in accordance with the instructions contained in A.M.O. A.30/53. Additionally, all exits and entrances to the store are to be marked by notices, in letters at least two inches high, as follows :—

"WARNING. RADIO ACTIVITY.
NO ADMITTANCE TO UNAUTHORIZED PERSONS.
NO LOITERING."

Usage.

9. Radio-active sources are to be used only for training under the personal supervision of the officer in charge of radio-active training equipment. (*See* para. 20 below.)

10. Radio-active sources are to be retained and carried in their appropriate containers. When they are required for actual use radio-active capsules are to be removed from these containers only by means of the correct carrying rods. At no time is a capsule to be touched by hand, or the radio-active material removed from its capsule.

11. All personnel using radio-active sources for training are to be equipped with a serviceable individual dosimeter, the use and reading of which MUST be understood by the wearer.

12. The maximum tolerance dose to which personnel are to be exposed in peace is not to exceed ·1 roentgen (100 milliroentgen) for each working day, or ·5 roentgen (500 milliroentgen) for each working week, whichever is the less.

13. Personnel are not to expose themselves deliberately to radiation in excess of the tolerance doses specified in para. 12 above.

14. Areas in which radio-active sources are exposed are to be protected by a substantial fence, or barrier, marked at 20-yard intervals in accordance with the instructions contained in A.M.O. A.30/53. Additionally all entrances and exits to those areas are to be marked by notices bearing the following warning in letters not less than two inches high :—

"WARNING. RADIO ACTIVITY.
NO ADMITTANCE TO UNAUTHORIZED PERSONS.
NO LOITERING."

15. If radio-active sources are to be used indoors, all entrances and exits to the building are to be marked by notices similar to those described in para. 14 above, except that the letters are to be not less than one inch high.

Calibration of Radiac Instruments.

16. All radiac instruments used in connection with the detection, measurement, or computation of the radiation from radio-active sources used for training are to be calibrated at least once every working week. Individual dosimeters are to be inspected for serviceability, correctly charged, and adjusted immediately before each issue and not less frequently than once every working week.

Recording the Radiation Received by Personnel.

17. A record is to be maintained of the radiation doses received by all personnel (including trainees) using radio-active sources for training. This record is to show the date and time at which the individual was exposed, and the dose received as recorded by the dosimeter issued to the individual. This record is to be compiled immediately after the period of exposure.

18. Record cards are to be completed and submitted weekly to the unit medical officer for inspection and signature.

19. A person who is found to have been exposed to radiation in excess of 500 milli-roentgen in any one working week is to be instructed to report immediately to the unit medical officer.

Appointment of an Officer in Charge of Radio-Active Training Equipment.

20. Each commanding officer is to appoint an officer to be in charge of the radio-active training equipment issued to the unit. The officer appointed must have qualified within the preceding three years on the Atomic, Biological and Chemical Warfare Unit Instructors Course at the Joint School of Chemical Warfare.

Responsibility of the Officer in Charge of Radio-Active Training Equipment.

21. The officer in charge of radio-active training equipment is to be responsible to the commanding officer for ensuring that the foregoing instructions are followed. In particular he is to ensure that radio-active sources are kept in safe custody at all times, and that when in use, the prescribed safety precautions are observed.

22. He is personally to supervise all training with radio-active sources, and the maintenance of records of the radiation received by personnel, in accordance with the instructions contained in paras. 17, 18, and 19 above.

Responsibility of Unit Medical Officers.

23. The unit medical officer is to supervise the health standards of all personnel working with radio-active sources.

24. He is to inspect weekly the record of radiation received by personnel; should any have been exposed to radiation in excess of 500 milliroentgen a week, he is immediately to report the details by signal to the Air Ministry (D. of H.). Details of personnel who have received total radiation doses in excess of 200 milliroentgen a week are to be reported to the principal medical officer of the command concerned.

25. The unit medical officer is also to arrange for personnel working regularly with radio-active sources to undergo a blood test when he considers this necessary. Such tests should be repeated at intervals depending upon the intensity of the training programme. The medical supervision and the blood testing of personnel working regularly with radio-active sources are to be in accordance with the instructions set out for radiographers in A.P. 1269, para. 445, clauses 1 and 3.

26. At units where the medical officer has attended a Medical Officers Course at the Joint School of Chemical Warfare, he is to be responsible for checking frequently the conduct of exercises and demonstrations in which radio-active sources are used; at units where the medical officer has not attended an appropriate course at the Joint School of Chemical Warfare this responsibility is to be undertaken by the principal medical officer of the command concerned, who is to arrange for training with radio-active sources at the unit to be inspected from the medical aspect at least once every three months.

A.52.—WORKS SERVICES AND PREPARATION OF ESTIMATES

(A.958887/48/D.D.O. 1.—19th February, 1953.)

(*This order replaces A.M.O. A.161/48.*)

1. The procedure described below is always to be followed by station commanders when initiating part II services.

2. Station commanders are in the first instance to call only for an approximate statement of probable cost; detailed estimates and drawings are not to be asked for. When the approximate statement has been received, the group or command headquarters (as appropriate), is to be consulted to ascertain whether or not the service is approved in principle, having regard to the availability of funds and to other approved services.

3. When the service has been approved in principle by the command, the section officer, or for services costing over £1,000, the superintending engineer, is to prepare the necessary sketch plans and a detailed estimate for formal submission to the command.

(*A.M.O. A.161/48 expired.*)

V. TECHNICAL AND SERVICING

A.53.—SERVICING DEMONSTRATION PARTIES

(A.126778/52/Eng.Plans 1.—19th February, 1953.)

(*This order replaces A.M.O. A.732/50.*)

Purpose

1. When a unit is re-equipped with a type of aircraft, or other technical equipment, new to a command, there is a transition period during which difficulties arise owing to lack of detailed knowledge of the equipment concerned.

2. To minimise these difficulties a limited number of servicing demonstration parties are established on the strength of the Central Servicing Development Establishment, and others may be established, if required, in commands at home.

3. Before introducing a new type of aircraft, or other technical equipment, into the Royal Air Force, arrangements will be made for a servicing demonstration party to be instructed in the servicing requirements of the equipment concerned, so that when a unit subsequently receives the equipment the servicing demonstration party can be attached to the station for the purpose of instructing unit servicing personnel by means of practical demonstrations given, as far as possible, on the actual item of equipment itself. This instruction will be confined to adapting existing skill in a trade to the needs of the new equipment. Servicing demonstration parties will not undertake basic trade training.

Medical Control within the R.A.F.

Responsibilities

4. **The Central Servicing Development Establishment.** Servicing demonstration parties established on the strength of the Central Servicing Development Establishment are responsible for—

(*a*) advising all concerned on servicing details, before the general introduction of the new aircraft or equipment into the service by—

(i) investigating and reporting on the servicing requirements during the prototype stage ;

(ii) supplying data for use during the compilation of servicing schedules ; and

(iii) providing assistance to units during the servicing of aircraft undergoing flying trials ;

(*b*) demonstrating servicing techniques to all commands during the introduction of new specialist equipment ; and

(*c*) demonstrating servicing techniques to commands abroad during re-equipment with new types of aircraft.

5. **Commands at Home.** Servicing demonstration parties, when established in commands at home are, during the period of re-equipment with a new type of aircraft, responsible for—

(*a*) demonstrating servicing techniques on airframes, engines, and their associated equipments, to stations within the command ; and

(*b*) advising stations within the command on installation details of specialist equipment as far as they affect the servicing of the equipment.

Planning and Specialized Training of Servicing Demonstration Parties

6. **Parties Established at the Central Servicing Development Establishment.** Specialist branches of the Air Ministry and the Ministry of Supply will advise the Commanding Officer, Central Servicing Development Establishment, through the Air Ministry (D.D.Eng.Plans), of technical developments, projects, and re-arming commitments, likely to require the services of, or special study by, servicing demonstration parties, and will state, where possible, the expected date of introduction of the equipment into the Royal Air Force.

7. **Parties Required by Commands at Home.** About four months before re-equipment with a new type of aircraft starts in a command at home, the command concerned is to send a request to the Air Ministry (D.D.Eng.Plans) (with copies to D.O.Est. and D.D.Tech.Serv.) for advice on the composition and training requirement of the servicing demonstration party for the new type of aircraft. Acting on the information received, the command will then apply to the Air Ministry (D.O.Est.), for a temporary increase in establishment to cover the commitment. This increase in establishment will be subject to periodic review by the Air Ministry (D.O.Est.) according to the scale of re-equipment.

8. **Training.** The training of servicing demonstration parties will usually be undertaken at the manufacturer's works, and requests for the attachment of a party to a firm for this purpose are to be sent to the Ministry of Supply (Serv.R.D.2) [a copy being sent to the Air Ministry (D.D.Eng.Plans)] in the form shown at the Appendix to this order.

Requests for Servicing Demonstration Parties of the Central Servicing Development Establishment

9. Requests for the services of servicing demonstration parties borne on the establishment of the Central Servicing Development Establishment are to be made through the usual channels to the Air Ministry (D.D.Eng.Plans). Normally, these servicing demonstration parties will be attached to stations for a period of four weeks.

Appendix

From :— .....

To :—MINISTRY OF SUPPLY, [SERV.R.D.2(b)] [COPY TO AIR MINISTRY, (D.D.ENG.PLANS)]

Date :— .....

Reference :— .....

APPLICATION FOR AUTHORITY TO VISIT MINISTRY OF SUPPLY ESTABLISHMENTS OR CONTRACTORS WORKS

Authority is requested for the undermentioned personnel to visit (*state here* establishment or firm to be visited).....

.....

for the purpose of (*state here* reason for visit).....

.....

The date proposed for the visit is.....

Estimated duration.....

No.	Rank	Name	Branch or trade
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Signature.....

(*A.M.O. A.732/50 cancelled.*)

Medical Control within the R.A.F.

VI. TRAINING AND EDUCATIONAL

A.54.—INITIAL ADMINISTRATION, SERVICE ACCOUNTANCY, AND EQUIPMENT OFFICERS COURSES

(A.970991/48/Pt.II/D.D.T.T.2.—19th February, 1953.)

1. **Location.** The Initial Administration, Service Accountancy, and Equipment Officers Courses are held at the R.A.F. School of Administration, Bircham Newton.

2. **Details and Duration of the Courses.**

(*a*) *The Initial Administration Course.* This course, which is of seven weeks duration, provides—

(i) initial training in R.A.F. administration for officers of the Secretarial Branch ; and

(ii) pre-O.C.T.U. training for N.S.A. cadets and for airmen and airwomen granted short service commissions in the Secretarial Branch.

(*b*) *The Service Accountancy Course.* This course, which is of eleven weeks duration, provides initial training in service accountancy for officers of the Secretarial Branch who have not previously qualified for employment on accountant duties, and for certain N.S.A. cadets and for airmen and airwomen candidates for commissions in the Secretarial Branch.

(*c*) *The Equipment Officers Course.* This course, which is of 13½ weeks duration, provides initial training in equipment organization and procedures, with some instruction on R.A.F. movements and certain technical subjects for newly commissioned officers, re-entrant officers, officers transferring from other branches, and short service and national service officer cadets.

Joining Instructions

3. Officers attending the Service Accountancy Course or the Initial Administration Course will normally be attached to the school. Those attending the Equipment Officers Course will normally be posted to the school. Officer cadets attending any of the three courses will be posted to the school.

4. Officers are to report to No. 2 Officers' Mess, and cadets are to report to the Cadet Block, between 1400 hours and 1900 hours on the day of assembly. Students travelling by train are to be given a single railway warrant to Heacham, Norfolk. Transport will meet the undermentioned trains on course assembly days :—

Departure from Liverpool Street	*Arrival at Heacham*
1150 hours	1530 hours
1425 hours	1810 hours

Living Out.

5. Married officers are advised that it will be to their advantage to live in the mess for the period of the course, so that they may derive full benefit from the instruction given, but permission to live out may be granted when circumstances warrant. When such permission is given, officers must make their own living-out arrangements and they are warned that accommodation in the vicinity of the school is not readily available.

Dress.

6. Officers are to take with them No. 1 and No. 2 (home) dress, greatcoats (during the winter months), gloves, service dress caps and berets, and the insignia of any orders, decorations, and medals, which they are entitled to wear. Officers in possession of mess undress may wear it on dining-in nights. Officer cadets are to be kitted to scale before their departure for Bircham Newton ; they are to take the insignia of any decorations and medals which they are entitled to wear.

Sport.

7. Facilities are available for golf, squash, tennis, cricket, rugby and association football, hockey, and swimming, according to season, and officers and cadets are expected to take part in at least one of those sports. Officers are required to bring their own sports kit; kit and equipment are provided by the school for the use of cadets.

Manuals and Textbooks.

8. All the necessary manuals and textbooks are available at the school.

Examinations and Reports.

9. Final examinations are held at the end of each course, and reports are forwarded in accordance with the instructions contained in A.M.O. A.112/52, as amended.

VII. EQUIPMENT AND SUPPLIES

A.55.—DISPOSAL OF ABANDONED R.A.F. MATERIAL RECOVERED FROM THE SEA

(A.130189/52/E.17.—19th February, 1953.)

1. Receivers of Wreck at the main ports in the United Kingdom communicate with the Air Ministry when they are advised of, or have handed to them, material thought to be R.A.F. property. Before claiming the material, the Air Ministry must decide whether it is R.A.F. property and, if so, whether it is of sufficient use and value to justify the cost of recovery, which may involve a payment of salvage remuneration to the finder for services rendered and possibly compensation for loss of or damage to his property.

2. All reports received from Receivers of Wreck will therefore be considered by the Air Ministry, who will, if necessary, instruct the R.A.F. station nearest the port concerned to send a representative, by arrangement with the Receiver of Wreck, to view the material and prepare a report giving as much information as possible under the following headings :—

(*a*) Description of item(s) including condition and estimated weight.

(*b*) Opinion on whether the material is R.A.F. property.

(*c*) Type of aircraft concerned.

(*d*) Opinion on whether the material should be claimed by the Royal Air Force, having regard to its possible use or value.

(*e*) Where the material was found and by whom.

A copy of the report is to be submitted by the R.A.F. station concerned to the Air Ministry (E.17).

3. When reports submitted in accordance with para. 2 above have been examined, the Air Ministry will decide if the salvaged material is or is not to be claimed by the Royal Air Force.

4. If the material is to be claimed, the Air Ministry will instruct the R.A.F. station concerned to arrange for the material to be collected and for a receipt to be given to the Receiver of Wreck. The R.A.F. station is to be responsible for the safe custody of the material until further instructions are received from the Air Ministry. A statement showing expenses incurred in collecting the material, etc., is to be sent to the Air Ministry (E.17).

5. If it is decided that the material is not to be claimed, the Air Ministry will advise the Receiver of Wreck accordingly.

Medical Control within the R.A.F.

3. We give special medical supervision to

AMENDMENTS

A.56.—AMENDMENTS TO PREVIOUS AIR MINISTRY ORDERS

(C.51705/52/S.T.9.—19th February, 1953.)

The undermentioned Air Ministry Orders are to be amended as shown in the Amendment Supplement at the end of this issue :—

A.789/48. Carriage of R.A.F. *Matériel* by Road by Civilian Vehicles—Home Units

A.653/49. Leave of Air Force Personnel

A.666/50. Destruction of " Black-Listed " Explosives by Armament Senior N.C.Os.

A.31/51. Concessional Travel on Civil Airlines

A.76/51. National Service Personnel—Procedure for Transition from Whole-Time to Part-Time Service and Alternative Forms of Voluntary Part-Time Service

A.241/51. Ministry of Supply Equipment Accounting Centres

A.406/51. Outbreak of Fire on Air Ministry Premises and at R.A.F. Units—Procedure for Notification and Holding Courts of Inquiry and Investigations

A.603/51. Rations to be Carried by Marine Craft

A.101/52. Post-War Code (1950) of Retired Pay, Pensions, Terminal Grants, and Gratuities, for Service in the Royal Air Force, the Women's Royal Air Force, and Princess Mary's Royal Air Force Nursing Service

A.572/52. Educational Qualifications for Promotion in Ground Trades—Introduction of Certain Modifications

A.1/53. Dress Regulations for Airmen and Airwomen of the Royal Air Force, the Women's Royal Air Force, and the Auxiliary and Reserve Air Forces

A.23/53. Disposal of Food Unfit for Human Consumption at Stations in the United Kingdom

(56860-3) Wt. 8019/N.2602 12,530 2/53 Hw.

AMENDMENT SUPPLEMENT

A.789/48.—CARRIAGE OF R.A.F. *MATÉRIEL* BY ROAD BY CIVILIAN VEHICLES—HOME UNITS

A.M.O. A.789/48 is further amended as follows :—

Para. 7, sub-para. (*a*) (ii), line 2. *Delete* from " arrangements " to end of paragraph and *substitute* :—

" instructions issued by the Director of Contracts, Air Ministry ".

(*A.M.O. A.56/53.*)

(*A.M.O. A.789/48, as amended by A.886/48, A.295/49, A.837/49, A.613/51, and A.709/51, amended.*)

A.653/49.—LEAVE OF AIR FORCE PERSONNEL

A.M.O. A.653/49 is further amended as follows :—

Para. 28 (as amended), sub-para. (*a*) (i). *Add* at end :—

" Exceptionally, officers holding permanent commissions who are retired compulsorily by reason of age or absence of suitable employment, following service in an appointment abroad during which they were not entitled to leave in the United Kingdom at public expense, will be granted 56 days terminal leave on retirement. The grant of 56 days terminal leave will absorb or cancel any other leave to which the officers may be entitled."

(*A.M.O. A.56/53.*)

(*A.M.O. A.653/49, as amended by A.675/50, A.165/51, A.82/52, and A.486/52, amended.*)

A.666/50.—DESTRUCTION OF " BLACK-LISTED " EXPLOSIVES BY ARMAMENT SENIOR N.C.Os.

A.M.O. A.666/50 is amended as follows :—

Title. *Delete* " ' **BLACK-LISTED** ' ".

(*A.M.O. A.56/53.*)

(*A.M.O. A.666/50 amended.*)

A.31/51.—CONCESSIONAL TRAVEL ON CIVIL AIRLINES

A.M.O. A.31/51 is further amended as follows :—

Para. 2, sub-para. (*a*). *Delete* last sentence and *substitute* :—

" The rebates are not available for journeys between the United Kingdom and—

(i) North America ;

(ii) Caribbean (this also applies to the sector Kingston—Bermuda) ;

(iii) South America ;

(iv) Australia (this also applies to journeys to and from Australian Territory)."

(*A.M.O. A.56/53.*)

(*A.M.O. A.31/51 amended. A.M.O. A.511/52 cancelled.*)

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A.76/51.—NATIONAL SERVICE PERSONNEL—PROCEDURE FOR TRANSITION FROM WHOLE-TIME TO PART-TIME SERVICE AND ALTERNATIVE FORMS OF VOLUNTARY PART-TIME SERVICE

A.M.O. A.76/51 is further amended as follows :—

Appendix C, part I, Counties in which Reservists Reside column.

Lines 3 and 4. *Delete* " and the County of Surrey ". and *substitute* :—
", the Counties of Surrey and Sussex ".

Line 8. *Delete* " Sussex,".

(*A.M.O. A.56/53.*)

(*A.M.O. A.76/51, as amended by A.201/51, A.478/51, A.648/51, A.327/52, A.415/52, and A.662/52, amended. A.M.O. A.364/52 cancelled.*)

A.241/51.—MINISTRY OF SUPPLY EQUIPMENT ACCOUNTING CENTRES

A.M.O. A.241/51 is further amended as follows :—

Para. 2.

Sub-para. (*d*), line 1. *Delete* " ' air ' ".

(*A.M.O. A.56/53.*)

Sub-para. (*e*). *Delete* this sub-paragraph.

(*A.M.O. A.56/53.*)

Para. 3, Address column, lines 1 to 11. *Delete* these lines and *substitute* :—

" No. 1 Equipment Accounting Centre,
' Sylvesters ',
Berkeley Avenue,
Reading,
Berkshire.
Telephone No. :—Reading 3284

No. 2 Equipment Accounting Centre,
1, Pulteney Street,
Bath,
Somerset.
Telephone No. :—Bath 5456 ".

(*A.M.O. A.56/53.*)

(*A.M.O. A.241/51, as amended by A.626/51, amended.*)

A.406/51—OUTBREAK OF FIRE ON AIR MINISTRY PREMISES AND AT R.A.F. UNITS—PROCEDURE FOR NOTIFICATION AND HOLDING COURTS OF INQUIRY AND INVESTIGATIONS

A.M.O. A.406/51 is further amended as follows :—

Para. 2, sub-para. (*b*), line 7. *Delete* " as a result of flying " and *substitute* " in flight ".

(*A.M.O. A.56/53.*)

(*A.M.O. A.406/51, as amended by A.75/52, amended.*)

A.603/51.—RATIONS TO BE CARRIED BY MARINE CRAFT

A.M.O. A.603/51 is further amended as follows :—

Para. 5. *Delete* " 21 Ration, special, type C .. 12 12 6 "

and *substitute* :—

" 21	Waterproof packets containing Dry biscuits (6 ozs.) Sweet biscuits (3 ozs.) Chocolate (4 ozs.)	12	12	6
	Tins preserved meat (5 ozs.)	12	12	6
	Tins cheese (1½ ozs.)	12	12	6 "

(*A.M.O. A.56/53.*)

Para. 6, sub-para. (*c*). *Delete* this sub-paragraph and *substitute* :—

" (*c*) The items specified in para. 5 above are to be demanded, as necessary, as follows :—

(i) Soup in self-heating cans (Stores Ref. 27P/12) is to be demanded by the catering officer from the equipment officer of the parent station, who will obtain it from the appropriate maintenance unit in accordance with normal procedure. On receipt of the items by the equipment officer, they are to be brought on charge on Form 1640 and transferred to the catering officer on Form 21.

(ii) The waterproof packets (and contents) and the tins of preserved meat, and of cheese, are to be demanded by the catering officer from the R.A.F. Supplies Depot, Halton."

(*A.M.O. A.56/53.*)

(*A.M.O. A.603/51, as amended by A.324/52, amended.*)

A.101/52.—POST-WAR CODE (1950) OF RETIRED PAY, PENSIONS, TERMINAL GRANTS, AND GRATUITIES, FOR SERVICE IN THE ROYAL AIR FORCE, THE WOMEN'S ROYAL AIR FORCE, AND PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

A.M.O. A.101/52 is amended as follows :—

Para. 7, sub-para. (*b*), column (iii). *Delete* asterisk before " Male officer " and *delete* footnote.

(*A.M.O. A.56/53.*)

Para. 21, lines 2 to 4. *Delete* from " part " to end of paragraph and *substitute* :—

" part ; on the termination of his further service he may receive additional terminal grant of the difference between the amount assessed under the provisions of para. 20, sub-para. (*a*) above, on the basis of his total reckonable service, and the grant he had received for his former service."

(*A.M.O. A.56/53.*)

Para. 22, lines 5 and 6. *Delete* from " promulgated " to end of paragraph and *substitute* :—

" found in part V below ".

(*A.M.O. A.56/53.*)

Para. 28, sub-para. (*b*), lines 2, 4, and 5. *Delete* " 1952 " and *substitute* " 1954 " in each instance.

(*A.M.O. A.56/53.*)

Para. 29, lines 3 to 5. *Delete* from " continue " to end of paragraph and *substitute* :—
" also reckon for additions to retired pay under the terms of para. 28 above."
(*A.M.O. A.56/53.*)

Para. 49, sub-para. (*a*) (ii) (2).
Lines 8 and 9. *Delete* from " rank " to " £240 " and *substitute* :—
" additional rank element of £120 ".
(*A.M.O. A.56/53.*)

Line 14. After " maximum " *insert* " rank element ".
(*A.M.O. A.56/53.*)

Para. 50.
Line 2. *Delete* " sub-para. (*a*) (ii) " and *substitute* " sub-paras. (*a*) (ii) and (*b*) (i) ".
(*A.M.O. A.56/53.*)

Lines 7 to 9. *Delete* from " only " to " Forces." and *substitute* :—
" as provided under the conditions of part V below."
(*A.M.O. A.56/53.*)

Line 10. After " cent " *insert* :—
", but the Air Council may in certain circumstances waive the penalty when the officer's premature retirement is within six months of the expiry of the period of Active List service undertaken by him ".
(*A.M.O. A.56/53.*)

Para. 56, lines 9 and 10. *Delete* these lines.

Below para. 56 *insert* the following new paragraph :—
" 56A. The retired pay or gratuity of an officer permitted to retire at his own request will be reduced by 10 per cent, but the Air Council may in certain circumstances waive the penalty when the officer's retirement is within six months of the expiry of the Active List service undertaken by him."
(*A.M.O. A.56/53.*)

Para. 57. *Delete* this paragraph and *renumber* paras. 58 to 62 as 57 to 61.

Para. 59 (as renumbered), line 1. *Delete* " para. 59 " and *substitute* " para. 58 ".
(*A.M.O. A.56/53.*)

Para. 60 (as renumbered), line 1. *Delete* " para. 59 " and *substitute* " para. 58 ".
(*A.M.O. A.56/53.*)

Insert the following new paragraph 62 :—
" 62. (*a*) An officer whose service retired pay has been suspended under the provisions of para. 60 above, will receive, on reversion to the retired list, retired pay assessed on the basis of former service added to re-employed service, if more favourable than his former rate of retired pay, as follows :—

(i) If the period of re-employment is not less than three years, or the date of the officer's original retirement was on or after 1st September, 1950—under the regulations for officers retiring from the Active List on or after 1st September, 1950.

(ii) If the period of re-employment is less than three years and the officer's original retirement was before 1st September, 1950—under the regulations for officers retiring from the Active List on or after 19th December, 1945, but before 1st September, 1950.

(*b*) If the officer had originally retired from the service voluntarily, re-assessed retired pay under either the conditions of sub-para. (i) or (ii) above will be on the basis of voluntary retirement, unless he is invalided from re-employment.

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(*c*) An officer whose retired pay has been suspended under the conditions of para. 60 above may receive, on his reversion to the Retired List, a terminal grant of one-tenth of the terminal grant for which he would have qualified under the provisions of para. 20 or 50 above on his original retirement had the provision then existed, for each complete year of re-employed service rendered after 31st August, 1950, subject to a maximum of ten tenths.

Para. 83. (*A.M.O. A.56/53.*)

After " 83." *insert* " (*a*) ".

Line 4. *Delete* " at the following rates " and *substitute* :—

" on the following scale ".

Renumber sub-paras. (*a*), (*b*), and (*c*) as (i), (ii), and (iii).

(*A.M.O. A.56/53.*)

Add the following new sub-para. (*b*) :—

" (*b*) Gratuity will be calculated on qualifying service as for service pension under the terms of para. 73 above."

(*A.M.O. A.56/53.*)

Para. 84, line 4. After " (for airwomen) " *insert*

", calculated on qualifying service as for service pension under the terms of para. 73 above,".

Para. 89. (*A.M.O. A.56/53.*)

After " 89." *insert* " (*a*) ".

Renumber sub-paras. (*a*), (*b*), and (*c*) as (i), (ii), and (iii).

(*A.M.O. A.56/53.*)

Add the following new sub-para. (*b*) :—

" (*b*) Gratuity will be calculated on qualifying service as for service pension under the terms of para. 73 above."

(*A.M.O. A.56/53.*)

Para. 94. *Reletter* sub-para. (*b*) as (*c*) and *insert* the following sub-para. (*b*) :—

" (*b*) Gratuity will be calçulated on qualifying service as for service pension under the terms of para. 73 above."

(*A.M.O. A.56/53.*)

Para. 96, line 4. After " rates " *insert* :—

", calculated on qualifying service as for service pension under the terms of para. 73 above ".

(*A.M.O. A.56/53.*)

(*A.M.O. A.101/52 amended.*)

A.572/52.—EDUCATIONAL QUALIFICATIONS FOR PROMOTION IN GROUND TRADES—INTRODUCTION OF CERTAIN MODIFICATIONS

A.M.O. A.572/52 is amended as follows :—

Para. 2, sub-para. (*b*), line 1. After " corporal " *insert* :—

" or corporal technician ".

(*A.M.O. A.56/53.*)

(*A.M.O. A.572/52 amended.*)

A.1/53.—DRESS REGULATIONS FOR AIRMEN AND AIRWOMEN OF THE ROYAL AIR FORCE, THE WOMEN'S ROYAL AIR FORCE, AND THE AUXILIARY AND RESERVE AIR FORCES

A.M.O. A.1/53 is amended as follows :—

Para. 18, lines 4 to 7. *Delete* from " (but not " to end of paragraph and *substitute :*— " . This badge is to be stitched on both sleeves of Nos. 1, 2, and 6 dresses, the greatcoat, and the W.R.A.F. raincoat, with the eagle facing to the rear. The centre of the top edge of the background is to be 1¼ inches below the shoulder seam, except for airmen of the R.A.F. Regiment, who are to wear it immediately below the R.A.F. Regiment arm badge (*see* para. 19 below)."

(*A.M.O. A.56/53.*)

Para. 19. *Delete* last sentence and *substitute :*—

" The badge is to be worn on both sleeves, with the centre point of the top edge ¼ inch below the sleeve head seam."

(*A.M.O. A.56/53.*)

(*A.M.O. A.1/53 amended.*)

A.23/53.—DISPOSAL OF FOOD UNFIT FOR HUMAN CONSUMPTION AT STATIONS IN THE UNITED KINGDOM

A.M.O. A.23/53 is amended as follows :—

Para. 4, sub-para. (*e*) (iii), line 9. *Delete* " 484 " and *substitute* " 848 ".

(*A.M.O. A.56/53.*)

(*A.M.O. A.23/53 amended.*)

(56860-5) Wt. 8019/N.2072 12,530 2/53 Hw.

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A.169726/53/D.D. of H. & R. 20th March, 1956.

The War Office (A.M.D.5)
S.W.1.

Recording of Individual Exposure to Ionising Radiation

Reference is made to the use of Army Forms A.20 and A.21 in the supervision of personnel exposed to ionising radiation.

2. At present the R.A.F. use registers to record individual dosages and medical information, but have recently had under consideration the use of forms similar to Army Forms A.20 and 21 These forms would fulfil the purpose required by the R.A.F., shou you agree that they could be made available for inter-service use.

3. A minor difference would be that the Royal Air Force would use Form A.21 as a confidential medical document which would be kept solely in the possession of the Unit Medical Officer, and would be enclosed in Form Med.4 on posting of the individual concerned. The forms are otherwise acceptable in their present form.

4. It is requested that your agreement be given to the proposal to include Army Forms 20 and 21 in the list of forms in common use by the Services,' in order that appropriate action may be initiated.

(J. S. WILSON)
Group Captain
Deputy Director of Hygiene and Research.

(d) Storage and handling of R/A components
Arrangements and instructions are as l
by A.W.R.E.

(e) Disposal of R/A Waste. Not applicable
but might provide problems in war. T
is being considered at present within
and by contact with Ministry of Housin
Local Government.

Medical Control within the R.A.F.

CONFIDENTIAL

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DGMS/5184

S.6.(B.S.)

Copy to D.D. of H.& R.

COMMENT BY D.G.M.S. ON PAPER R.A.(56) 1
DATED 8th MARCH 1956

1. Certain aspects of the problem of civil regulational control of radioactive (R/A) substances may be relevant to the R.A.F.

Analysis of R.A.F. Commitment

2. The R.A.F. is concerned with R/A sources in the following ways :-

(a) Luminising Processes. In these processes (e.g. dial painting in Maintenance Command) we conform with the Factories (Luminising) Special Regulations 1947. It is of interest that these Regulations were largely derived from instructions laid down in the R.A.F. in the mid-thirties when there were no civil regulations.

(b) R/A Sources in Passive Defence Training. The Ground Defence organisation handles small R/A sources for training purposes. Air Ministry Orders govern storage and handli The risk is to the permanent staff and not to trainees.

(c) Servicing of Radiac Instruments and use of Operational R/A Instruments. The quantities of R/A sources used for these purposes are sma Storage and handling are governed by A.M.O. and by a Technical Publication.

(d) Storage and handling of R/A components of Weapon Arrangements and instructions are as laid down by A.W.R.E.

(e) Disposal of R/A Waste. Not applicable in peace but might provide problems in war. The matter is being considered at present within Air Minis and by contact with Ministry of Housing and Local Government.

Medical Control within the R.A.F.

3. We give special medical supervision to personnel employed in handling R/A sources.

4. Medical officers responsible for preservation of health where R/A risks exist are instructed at Harwell and Wittering.

Application/...

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Application of Future Civil Regulations within the R.A.F.

5. We should conform with any civil regulations applicable to our tasks.

6. Access of civilian Inspectors would be impossible where security is demanded.

7. I see no essential objection to access of civil Inspectors to R.A.F. installations where problems of security do not arise. But generally in other comparable fields - public health and industrial - the R.A.F. carries out its own inspections and enforcement of regulations. We are always ready to ask for advice in these fields, and especially we co-ordinate with the civil authority where any question arises of risk to the health of the civil population. A similar arrangement might be suitable in the R/A field.

19th March 1956

(SGD.) J. M. KILPATRICK.
D.G.M.S.

CONFIDENTIAL

04

LOOSE MINUTE

A.169726/53/D.D.of H&R

D.D.G.D.

Regulations for Use, Care and Storage of Radio-Active Sources issued for Passive Defence Training

I have the following comments and suggestions on your draft A.M.O. on this subject.

Page 2 - Para. 7(d) Would it be necessary here to include "and for reporting dosage in excess of max. permissible levels"?

Para. 8. I do not like "rendering innocuous" as no radiation of this type can be innocuous. One could say "of lessening the danger to personnel in the vicinity except by shielding or keeping at a safe distance."

Page 4 - Para. 19. The term "use" might be better replaced by "handle or move"

Para. 22. Heading - "Permissible levels of exposure to radiation" - Suggest as follows. No instructor or other authorised person is to expose himself or any trainee to radiation except when required to do so during instruction or other duty when he will ensure that the time of exposure is no greater than that essential for immediate training or other authorised purpose. The maximum peacetime permissible dose to which personnel may be exposed is not to exceed 0.1 roentgen (100 millie roentgens) for any working day or a total of 0.3 roentgen (300 millie roentgens) for a period of any 7 consecutive days.

Para. 23. Add at end. "The Radiac Officer will notify the unit Medical Officer and instruct the individual exposed to report to him."

Para. 24. Is it intended to use the Army forms. I think we should do so and get them made into interservice forms. I have written the medical paragraphs on this assumption.

"Personnel dosimeter adjusted to zero is to be issued each day, when exposure to radiation is expected, before training or other duty commences to each person (including trainees) at risk. A record is to be kept on Army Form A20 (weekly record of individual dosimeter readings) of the radiation received by all personnel except trainees. Only when trainees receive radiation in excess of half of the maximum permissible daily dose will this be recorded. That is above 50 mr per day. Dosimeters are to be read when handed in and recorded immediately after the period of exposure normally at the end of the working day. The recorder must fully understand the operation of the dosimeter and be able to read it accurately."

(I think it a mistake to allow personnel to read their own dosimeters. In my experience the average airman does not do it properly and mistakes will frequently occur unless someone experienced does it.)

"Record sheets are to be completed and passed to the medical officer for scrutiny and signature at the end of each week.

Omit last paragraph.

Para. 27(b). I do not think personnel need know how to use them if you agree they will not be reading them.

Para. 27(f). He is personally to supervise the arrangements for reading dosimeters and the maintenance of records of the radiation received by personnel. He is to ensure that the weekly records of individual exposure to radiation are sent to the unit medical off after completion.

Para.28 Medical officers responsibilities to be centre heading.

/(f)

Delete paras. 28 -

) the following paras. 28 - 40.

Medical Officers Responsibility

Para. 28. The unit medical officer is to supervise as described below the health of all persons regulary exposed to radiation, namely training staff, storekeepers and others who are regularly handling or working in proximity to radio-active sources. This order does not however apply to those casually so employed when the occasional dose of radiation received is within permissible limits or to personnel undergoing station passive defence training.

Para. 29. He is to ensure that all personnel before regular employment are in good general health and have undergone a blood examination, that they are subsequently examined periodically while at risk and that medical records of radiation exposure, medical examinations and blood tests are kept.

Para. 30. He is to satisfy himself frequently that the health physics arrangements during exercises and demonstrations in which radio-active sources are used are satisfactory. If he has not attended an appropriate course of instruction in the use of radiac instruments the Principal Medical officer of the Command concerned is to arrange for such supervision to be exercised at least once every quarter by a suitably trained medical officer.

Para. 31. He is to notify the competent medical authority when personnel are exposed to radiation in excess of the limits given in paragraph 22. A short report of the circumstances and of action taken is also to be sent to the competent medical authority with a copy to Air Ministry (D. of H. and R).

Para. 32. Similar action (to para. 31) is to be taken in the event of an unsatisfactory or doubtful routine blood test.

Blood examination

Para. 33. Examination of the blood is to include red cell count, haemoglobin estimation and differential white cell count in total cells per c.b. mm. A note is to be made of any abnormal cells.

Para. 34. Pre- employment blood counts on the borderline of abnormality may be repeated on one or two successive days or at intervals of a few days before a decision regarding fitness is made.

Para. 35. Provided radiation monitoring (both site monitoring and personnel monitoring) are satisfactorily carried out routine blood examinations are to be carried out every six months. More frequent examinations will be required when monitoring has been observed to be unsatisfactory, when radiation of personnel has been above permissible levels or when indicated by the intensity of the training programme or the state of health of any exposed individual.

Para. 36. The white cell count provides the only practical indication at present of sensitivity to ionising radiation but it will not in all cases give early warning of adverse biological effects. The following critical levels of white blood cells in totals per c.b. mm. are accepted for guidance.

	Normal	Warning level	Rejection level
Neutrophils	2,250 - 8,200	3,000	2,000
Lymphocytes	1,100 - 3,800	1,000	750
Leucocyte total	4,500 - 12,100	4,500	3,000
Abnormal cells	nil	nil	present

/37.

Para. 37. Personnel having blood count at or below warning level are not to be exposed to further radiation. When a routine blood count shows an appreciable fall to near warning level it is to be repeated weekly and if the fall is progressive the individual is to be removed from exposure to radiation until further examination indicates fitness for such duty.

Excessive radiation dosage

Para. 38. When an individual is found to have been exposed to radiation in excess of the weekly maximum permissible level of 0.3 r he is to be removed from the risk of further exposure until the average weekly dose taken over the preceding 13 weeks has fallen to below 0.3. r. If the amount of excess radiation received has been small it may, hereafter, not be necessary to remove the individual from duty involving further exposure.

Documentation

Para. 39. A personal record of exposure to radiation (Army Form A21) is to be raised by the unit medical officer for all persons under health surveillance for radiation. This form which is a confidential record is to be maintained from the weekly record of individual dosimeter readings (Army Form A20), when this is passed for scrutiny to the medical officer at the end of each week by the Station Radiac Officer.

Para. 40. Dates of medical examinations, periods of suspension from duty involving radiation and details of blood examinations are also to be entered on the personal record cards (Army Form A21). When an individual leaves the unit on posting his record card is to be given an enclosure number and placed in F. Med. 4.

Renumber paras. 32 onwards.

Para. 42. - (new numbering)
2nd line after table 'that' should be 'at'

I take it that limitation on the numbers of sources stacked together is inapplicable here and refers only to bulk storage.

Para. 47. Add "from these sources in the quantities held."

Para. 49(b) - Add 'per hour'

Para. 49 (c) - line 3 - New sentence from "The' address."

Para. 50 Suggest omit "and know how to use it." add at end of para. "by the Radiac Officer's representative on return to the parent unit."

(J.S. WILSON)
Group Captain
D.D. of H.& R.

February, 1956
IMW

From: Group Captain J. S. WILSON, M.B., Ch.B., D.P.H.
TEL. : HOLBORN 3434 Extn. 6595
Correspondence on the subject of this letter should be addressed to :—
THE UNDER SECRETARY OF STATE,
AIR MINISTRY (D.D.of H. & R.)
and should quote the reference :—
C.68698/55/D.D.of H. & R
Your Ref. .....

1464
55.7

AIR MINISTRY,
LONDON, W.C.2.

29th November, 1955.

Dear Tonks

Would you please consider the attached Army forms. We also require similar records of radiation dosage, and at present these are contained in registers without any personal record being kept. However, it will be necessary to include in each individual's form Med.4 record of radiation dosage in those trades where there is a definite risk. The only criticism which I have, apart from the fact that the blood components are sometimes in capital letters and sometimes in small ones, is that it is difficult to keep an accurate figure which indicates the total radiation received over the previous seven days. The weekly record shows an accumulating dose which presumably is added up at the end of the seventh day, but this rather neglects the fact that permissible levels of radiation dosage are calculated on seven consecutive days, which in fact may be Wednesday to Wednesday, and not always Monday to Sunday. In other words you can have two weekly totals, both of which are below the maximum permissible dose, and yet have experienced an overdose between one Wednesday and the next. This form does not cover this point and indeed I can think of no way of designing a form so that one can overcome this criticism. I assume that the Army could not cover the point, and came to the conclusion that it would be sufficient in practice to calculate total dosages by calendar weeks. I asked Thorburn to think out some way round this problem, and I attach his attempt at a form. I am afraid it takes up far too much space, and is too complicated for the average airman to understand. I should think that, even so, it is still the simplest way of doing it.

To sum up, if you cannot think of a better way, we will probably just accept the Army form.

Yours

J S Wilson

Wing Commander J. D. Tonkinson, MRCS., LRCP., DPH.,
Air Ministry (M.A.7),
London Road,
Stanmore,
Middlesex.

? Substitute 1-7 for Mon-Sun

A 169726/53

143B
54A

A

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

D.C.D.

September, 1953.

Regulations for the Use, Care and Storage of Radioactive Sources issued for Passive Defence Training

C.56380/53

51 1953

This order is concerned with the safe use, storage and transportation of radioactive sources issued for Passive Defence training. The bulk storage and transportation of radioactive materials are dealt with in A.P.830, Vol.II Leaflet C.2

GENERAL

Types of Radioactive Sources

2. The type of radioactive sources issued to the R.A.F. and the purposes for which they are used are described in Appendix "A" to Precautions Against Atomic Attack (W.O. Code No. 8769).

3. A.P.3111 Part B lists the radioactive sources which are issued in a radiac training set, namely:-

Ref.No.	Description	Quantity
14	Sources, R.A., B No.1	10
19	Sources, R.A., C No.1	1
23	Sources, R.A., D No.1	2

Radiac Instruments

4. The following instruments are also included in the radiac training set:-

Ref.No.	Description	Quantity
110117	Calculator Radiac No.1	2
110004	Charging Units	1
110001	Dosimeters Q.F. No. 1	8
110101	Dosimeter Q.F. No.2A	1

/110003

/(f)

Ref.No.	Description	Quantity
110003	Dosimeter Q.F. No.3	1
110012	Meters, contamination No.1	1
110010	Meters, survey, portable trainer No. 1	4

Hazards Associated with the Use of Radioactive Sources

5. The sources listed in para. 3 are radiocobalt (Co^{60}); these sources give off gamma rays continuously, and ~~These rays~~ are even more penetrating than X-Rays - but as with X-Rays - their effect is reduced by distance and shielding in the way which is shown in paragraphs 55 and 56. Gamma rays are harmful to living matter. They cannot be detected by ordinary senses and Radiac instruments must be used. These rays are injurious if they enter the human body in excessive quantities; ~~these sources are potentially dangerous~~, therefore personal exposure to these radiations must be kept within safe limits. The limits are defined in paragraph 22.

6. It is essential to limit doses of radiation by:-

(a) Good discipline

(b) Simple, unambiguous orders which are easy to remember.

(c) Reliable individual dosimeters which are well maintained and serviced and which are checked frequently against standard sources.

7. Wherever radioactive sources are used in the R.A.F. the following measures are necessary:-

(a) A set of regulations for the use of radioactive sources.

(b) An instructor to be in charge of the sources and radiac instruments and to be responsible for them to the Commanding Officer.

(c) An individual dosimeter for each person who could receive more than 100 milliroentgens during the course of a day.

(d) A system of recording all individual dosimeter readings at the end of periods of exposure.

(e) A suitable store for the instruments, and a suitable store for the sources and their containers.

Summary

8. Radioactive sources are potentially dangerous. There is no way of rendering them innocous, except by shielding and distance.

/9...

9. Safety for instructors, trainees and other persons ~~should be~~ is ensured by good discipline and strict adherence to safety regulations.

10. There should be no difficulty in obtaining adequate training by using the training instruments in conjunction with small sources without infringing those regulations.

11. ~~The observance of the regulations is, in itself, a useful training for following similar orders which would be given in war.~~

USE OF RADIOACTIVE SOURCES FOR PASSIVE DEFENCE TRAINING

Definitions

12. In these regulations the word "instructor" means:-

(a) An officer, Warrant Officer, or Senior N.C.O. who has qualified within the preceding three years on a Unit Instructors' Course at the Joint School of Chemical Warfare, and whose Course Report is annotated, "Qualified in the use, care and storage of radioactive sources".

(b) A Warrant Officer or Senior N.C.O. who has qualified within the preceding three years on an Assistant Unit Instructors' Course at the Joint School of Chemical Warfare, and whose course report is annotated "Qualified in the use, care and storage of radioactive sources".

(c) An officer who has qualified within the preceding three years on a Junior Regiment Officers' Course at the R.A.F. Regiment Depot, R.A.F. Catterick, and whose course report is annotated as in (a).

(d) An N.C.O. who has qualified in the preceding three years on a Senior Gunner Instructors' Course and whose course report is annotated as in (a).

(e) A Civil Defence Instructor who is in possession of a valid Civil Defence General Instructors Certificate issued to him on completion of a course at one of the Home Office Civil Defence Technical Training Schools: provided that the course commenced after the 1st March, 1952, or the instructor concerned has successfully completed a Refresher General Course at one of those Schools since that date.

13. The expression "Radiac Officer" means the instructor who has been appointed by the Commanding Officer to be responsible to him for the duties enumerated in paragraph 27.

/14.

Conduct of Demonstrations, etc.

14. Demonstrations or exercises involving the use of radioactive sources are to be conducted by an instructor who will be responsible for ensuring compliance with these regulations. Where several instructors are co-operating in a demonstration or exercise, responsibility will fall on the instructor nominated for the prupose by the Radiac Officer.

15. Outdoor demonstrations or exercises are to take place in an area from which the general public and other unauthorized persons can be excluded. Warning notices are to be displayed in conspicuous positions, bearing the words in letters at least two inches high,

WARNING RADIOACTIVITY

NO ADMITTANCE TO UNAUTHORIZED PERSONS

NO LOITERING.

16. If radioactive sources are to be used INDOORS, all entrances and exits to the building are to be marked by notices as in para. 15, ~~except that the letters are to be not less than one inch high.~~

Use of Radioactive Sources

17. Each source and each container is marked with an identification number. A source must be carried or stored only in its own container.

18. No person shall remove the actual radioactive material from its capsule or touch the capsule with the fingers at any time. Sources must always be moved by means of the carrying rod and must always be kept inside their appropriate containers until they are needed for use.

19. No person is to use radioactive sources unless authorized to do so by the ~~Radiac Officer~~. responsible instructor

20. A single type B source may be handled in a manner directed by an instructor.

21. Personnel using radioactive sources for training purposes must be in possession of a serviceable Dosimeter, Q.F. No. 1. The use and reading of which must be understood by the wearer.

Permissable Amount of Exposure to Radiation — ~~Permissible Levels~~

22. No instructor is to expose himself or any trainee to a dose of radiation except when required to do so during instruction when he will ensure that the time of exposure is no greater than that essential for immediate training purposes. The maximum peacetime permissible dose to which personnel may are to be exposed is not to exceed 0.1 roentgen (100 milliroentgens) for each working day of 8 hours or 0.3 roentgen up to a limit of no total of 0.3 roentgen (300 milliroentgens) for each working week of 5 days (40 hours). a period of any consecutive days.

/23...

23. The responsible instructor must notify immediately the Radiac Officer if he or any other person is accidentally exposed to radiation exceeding the permissible limits in para. 22. His report must state the dosimeter reading s and the reason for the occurrence.

Recording the radiation received by personnel

24. A record is to be maintained of the radiation received by all personnel (including trainees) using radioactive sources for training. This record is to show the date and time at which the individual was exposed, and the dose received as recorded by the dosimeter issued to the individual. This record is to be compiled immediately after the period of exposure.

Record cards are to be completed and submitted weekly to the unit medical officer for inspection and signature .....

A person who is found to have been exposed to radiation in excess of 300 milliroentgen in any one working week is to be instructed to report immediately to the unit medical officer.

Storage of Radioactive Sources and Radiac Training Instruments

25. Radioactive sources, when not in use, are to be kept in the Radioactive Source Store, which must bear a notice "Warning Radioactivity - No admittance to Unauthorised Persons - No Loitering".

26. Radiac training instruments, when not in use, are to be locked in the Instruments Store to prevent loss or damage.

Appointment and Responsibilities of the Radiac Officer

27. A Commanding Officer is to appoint a Radiac Officer to be responsible to him for:-

(a) Ensuring that all radioactive sources are stored and carried in their correct containers, and that they are locked in the radioactive sources store when not in use.

(b) Ensuring that all persons using radioactive sources, including drivers and passengers in vehicles in which radioactive sources are being transported are provided with serviceable dosimeters.

(c) Ensuring that the regulations prescribed in this order are observed.

(d) Notifying the Commanding Officer immediately a report is made to him in accordance with para. 23.

(e) Ensuring that the Radiac instruments are maintained in good order and are tested at least once a week. In particular he is to make sure that technical dosimeters have been checked for serviceability and are properly charged and adjusted before each issue.

/(f)

(f) He is personally to supervise the maintenance of records of the radiation received by personnel.

Responsibility of Unit Medical Officers

28. The unit medical officer is to supervise the health standards of all personnel working with radioactive sources.

29. He is to inspect weekly the record of radiation received by personnel; should any have been exposed to radiation in excess of 300 milliroentgen a week, he is immediately to report the details by signal to the Air Ministry (D. of H.P.). Details of personnel who have received total radiation doses in excess of 200 milliroentgen a week are to be reported to the principal medical officers of the command concerned.

30. The unit medical officer is also to arrange for personnel working regularly with radioactive sources to undergo a blood test when he considers this necessary. Such tests should be repeated at intervals depending upon the intensity of the training programme. The medical supervision and the blood testing of personnel working regularly with radio-active sources are to be in accordance with the instructions set out for radiographers in A.P. 1269, para. 445, clauses 1 and 3.

31. At units where the medical officer has attended a Medical Officers Course at the Joint School of Chemical Warfare he is to be responsible for checking frequently the conduct of exercises and demonstrations in which radio-active sources are used; at units where the medical officer has not attended an appropriate course at the Joint School of Chemical Warfare this responsibility is to be undertaken by the principal medical officer of the command concerned, who is to arrange for training with radioactive sources at the unit to be inspected from the medical aspect at least once every three months.

STORAGE AND TRANSPORTATION OF RADIOACTIVE SOURCES ISSUED FOR PASSIVE DEFENCE TRAINING

Radiac Instruments

32. No unit is to take delivery or custody of radioactive sources unless it has the measuring and detecting instruments; as laid down in the current scale of issue, and the means of maintaining the instruments in a serviceable condition.

/33.

Storage for Radioactive Sources

41 35. The radioactive sources included in the training set comprise the following:-

Sources	Dose rate at one yard (milliroentgens per hour) (when out of their respective containers) Per Source	Total
10 Type "B"	.16	1.6
1 Type "C"	1.6	1.6
2 Type "D"	7.8	15.6
		18.8

42 36. Inside the containers for Types "C" and "D" sources blocks of lead are placed to shield the sources and attenuate the dose rate by 0.50 and 0.14 respectively. The resultant dose rate at one yard is therefore:-

Sources	Dose Rate (milliroentgens per hour)	Reduction Factor	Resultant Dose Rate
10 Type "B"	1.6	-	1.6
1 Type "C"	1.6	0.5	.8
2 Type "D"	15.6	0.14	2.2
			4.6

The source containers have been designed so that the dose rate at the surface of the containers shall not be more than 200 milliroentgens per hour and that at one yard not more than 12 milliroentgens per hour. Therefore elaborate arrangements for the storage of sources are unnecessary. The main requirements to be met in storage are:-

(a) That the containers and sources shall be kept dry to prevent corrosion.

(b) That persons shall not work or live in close proximity to them without being sufficiently shielded from radiation.

(c) That it should not be possible for unauthorised persons to tamper with them.

43 37. The standard of protection is that the dose rate at any point on the outside of the store must not exceed 100 milliroentgen in 24 hours (~~300 milliroentgens per week~~), this being the peacetime permissible exposure. Storage should, as far as possible, be provided in existing accommodation; use being made of a separate store or of a suitable room in a building. If a room inside the building is used care must be taken to ensure that the radiation to adjacent rooms does not exceed the prescribed limits. The dose rate on the outer sides of the walls and roof is to be checked by means of the training type of survey meter, contamination meter or a technical dosimeter.

44 38. When a suitable building is not available, radioactive sources may be

/stored

stored in specially prepared pits. The pits are to be dry and covered. They are to be within a small fenced area which is to be marked as in para. 38. The fence should be located so that the dose rate does not exceed 0.1 roentgen (100 milliroentgen) per 24 hours at any point on the perimeter.

~~37.~~ Radioactive sources are not to be stored with ammunition or explosives. The safety distances given in A.P.2608A, Part 2, Leaflet No.5 are to be applied when radioactive sources are stored in the vicinity of explosives or chemical weapons.

~~38.~~ Radioactive sources stores and/or fences surrounding the store are to be clearly marked, in letters at least ~~an~~ two inch high -

"WARNING - RADIOACTIVITY, NO ADMITTANCE

TO UNAUTHORISED PERSONS, NO LOITERING."

~~39.~~ Providing that the foregoing paragraphs are applied there is little danger, if any, from radiation.

Transport of Radioactive Sources

~~40.~~ Radioactive sources ~~should~~ are not be carried by hired transport, rail or other forms of public transport. The movement of radioactive sources should be confined to the minimum necessary for training purposes.

Carriage by Service M.T. Vehicles

~~41.~~ When radioactive materials are carried by Service M.T. vehicles the following precautions ~~will~~ are to be observed:-

(a) Radiation level at the driver's seat or at any seat occupied by a passenger ~~will~~ shall not be greater than 0.1 roentgen (100 milliroentgens) per 8 hours.

(b) The radiation limit at any point on the outside of the vehicle will not exceed .2 roentgen (200 milliroentgen).

(c) A notice ~~will~~ shall be carried in a conspicuous position on the vehicle indicating that the radioactive sources are packed in sealed containers and indicating their location in the vehicle the address and telephone number should be included so that the police/public may contact the unit concerned in the case of an accident.

(d) It is forbidden to carry unauthorised passengers.

(e) Sensitive photographic materials will not be allowed in the same vehicles as radioactive materials.

A notice in the form of the example below will comply with the requirements of 41(c).

/WARNING

WARNING

THIS VEHICLE IS CARRYING RADIOACTIVE MATERIAL
IT IS CARRIED IN CONTAINERS AT THE BACK OF
THE VEHICLE.

THE CONTAINERS ARE SAFE TO HANDLE FOR SHORT
PERIODS IF THEY ARE UNDAMAGED. IN CASE OF
ACCIDENT TO THIS VEHICLE COMMUNICATE AT ONCE
WITH RADIAC OFFICER ..... TEL NO.....

50

42. The driver of the vehicle, and any authorized passengers must carry a serviceable Dosimeter Q.F. No. 1, ~~the reading of which must be recorded at the end of the tour of duty.~~ and know how to use it. The amount of radiation registered at the end of the journey is to be recorded on his record card by the Radiac Officer or his representative on return to his parent unit.

Carriage in Service Aircraft

57

43. When properly packed in limited quantities, radio-active materials cannot endanger the safety of an aircraft or its equipment, or persons on board the aircraft. For the purpose of carriage by air, radio-active materials are to be treated as restricted freight, and the instructions laid down in A.P. 3150, part 2, section 4, chapter 7, for this class of material, are to be observed. The radio-active materials are to be packed in their special containers, which must be sealed. The containers are to be packed either in strong wooden cases having a minimum dimension of four inches on any one side, or in wicker baskets braced with steel straining wires, of a design complying with the requirements of para. 26 above.

44. The "Certificate of Safety" required under the provisions of A.P. 3150, part 2, section 4, chapter 2, para. 8, signed by a responsible persons, is to accompany each package. In addition, a label worded as follows is to be attached to each package:-

"RADIO-ACTIVE MATERIAL

TYPE:-

PRINCIPAL RADIO-ACTIVE CONTENTS:-

ACTIVITY OF CONTENTS:-

DO NOT REMAIN IN THE
IMMEDIATE VICINITY OF THIS
CONTAINER UNNECESSARILY."

45. The undermentioned special precautions are to be taken:-

(a) Containers are to be packed as far back in the aircraft, and as far from passenger seats, as possible.

(b) The radiation level at the nearest seat occupied by a passenger or member of the crew for the duration of the flight must be below 100 mr./8 hrs.

(c) The radiation limit on the outside of the aircraft must be below 200 mr. /hr.

(d) Sensitive photographic material is on no account to be loaded in the same aircraft.

APPENDIX 'A'

TECHNICAL INFORMATION

The Roentgen Unit

46. The roentgen unit is the unit of dose of X or gamma radiation: a milli-roentgen is a one thousandth part of a roentgen, and a microroentgen one millionth part of a roentgen.

Characteristics of Radioactive Sources

47. The sources at present issued for training are radiocobalt (Cobalt 60). Radiocobalt emits a beta ray and two successive gamma rays. As the active material is encased in a metal capsule only the gamma rays are important.

48. Radiocobalt (Cobalt 60) loses about 3.2% of its remaining activity every 3 months, reaching half value in 5.3 years. A graph giving the fall-off strength of cobalt 60 is given in Appendix B, diagram 1.

49. Because of the decay, radioactive sources Type B. C and D will become unserviceable for training about 5 years after production. Instructions will be issued when a decision has been made in this respect.

Containers used for Sources

50. The containers for radioactive sources are designed to prevent personnel from being injured by the rays during transport and storage.

51. They consist of three parts:-

(a) A capsule which is sealed round the actual active materials and is fixed to the carrying rod.

/(b)

(b) A shield of lead to attenuate the radiation from the larger sources.

(c) An outer container of light material which reduces the dose-rate at its surface by the inverse square law effect.

The external dimensions of the containers are:

Types C - D Height 11 ins. Diameter 6.7 ins.

52. Attenuation could be produced by lead alone but this would add to the weight and cost. The attenuation factors for the lead shields employed are:-

Type C	1.5 cm.	lead 0.50;
" C (Twin)	3 cm.	lead 0.23;
" D	4 cm.	lead 0.14;

53. The dose-rate at 1 yd. ~~must~~ does not exceed 12 milliroentgen per hour (10 milliroentgen per hour at 1 metre) and the dose-rate at the outer surface of the outer container ~~must~~ does not exceed 200 milliroentgen per hour.

54. Photographic materials (e.g. film negatives) are likely to be affected by small doses of nuclear radiation and should, therefore, not be left or carried where they are likely to be damaged from this cause. Containers in which sources are kept when not in use do not provide complete protection as far as film negatives are concerned.

Relation Between Dose Rate and Distance

55. The dose rate received at various distances from the 'C' and 'D' sources are in the following table.

Type of Source	Dose rate received at various distances (milliroentgens per hour)						
	1 ft.	2ft.	3 ft.	6 ft.	9 ft.	30 ft.	100 ft.
C	14.4	3.6	1.6	0.4	0.18	0.016	0.0014
D	70.0	17.5	7.8	1.93	0.85	0.074	0.006

/It

It will be seen that if the distance is doubled, the dose rate is reduced to a quarter. This is "inverse square law" effect. For a number of sources aggregated so as to behave as a point source the dose rate will increase pro rata, e.g. four sources of Type "D" grouped to form a point source will produce a dose rate of 0.024 milliroentgens per hour at 100 feet. The effect due to a number of sources spread out is complex and best determined by trial.

Attenuation and Shielding

56. In addition to the attenuation afforded by distance, gamma rays are attenuated in various ways when the pass through materials of all kinds. As a general rule, the amount of attenuation caused by a material depends on the weight of that material per unit area, imagine it to be in the form of a slab through which the rays pass. The graph (Diagram 2) shows the extent to which gamma rays from radiocobalt are attenuated by various materials shown. The thickness for concrete and steel are liable to vary as the composition of these materials is not fixed. The thickness for brick and earth is not given as it is subject to great variation in composition.

57. In order to check the dose rate outside the radioactive sources store with the training type survey meter, readings will have to be taken at suitable distances, as the maximum scale readings of this instrument is 300 microroentgens per hour (or 0.3 milliroentgens per hour). For example, the dose rate at 1 yard from a set of radioactive sources in their containers is 4.6 milliroentgens per hour, which is 4600 microroentgens per hour, beyond the range of the training Survey meter, but if a measurement were to be taken at 4 yards from the set the dose rate will be $\frac{1}{16}$ i.e. $(\frac{1}{4})^2$ of the dose rate at 1 yard, therefore $\frac{1}{16} \times 4600 = 287.5$ microroentgens per hour.

Scattering of Gamma Rays

58. Most readings of dose-rate or dose taken during training will include radiation scattered into the instrument by the air or any objects in the vicinity, as well as the direct beam from the source. This scattered radiation is similar to the sunlight which is scattered into a house through the windows although the direct rays may be shining in another direction.

59. The scattered radiation usually adds to the dose-rate and dose-rate calculations based on the Table in Section I of this Appendix will be on the low side for this reason.

60. ~~It is not thought practicable to deal quantitatively with scatter here.~~

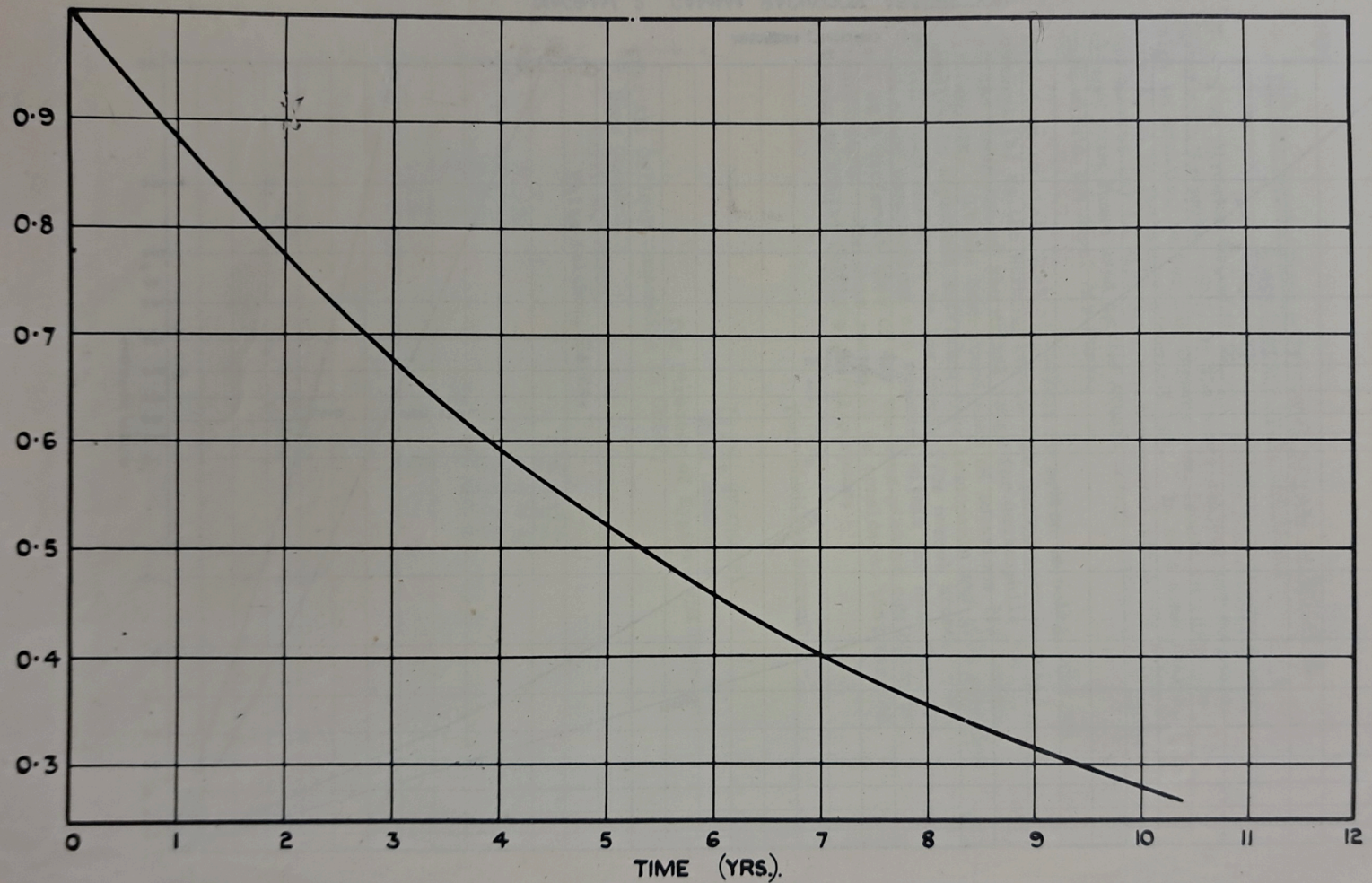

DIAGRAM 1. DECAY OF COBALT - 60 SOURCES.

DIAG. 1.

54 B

DIAG. 2.

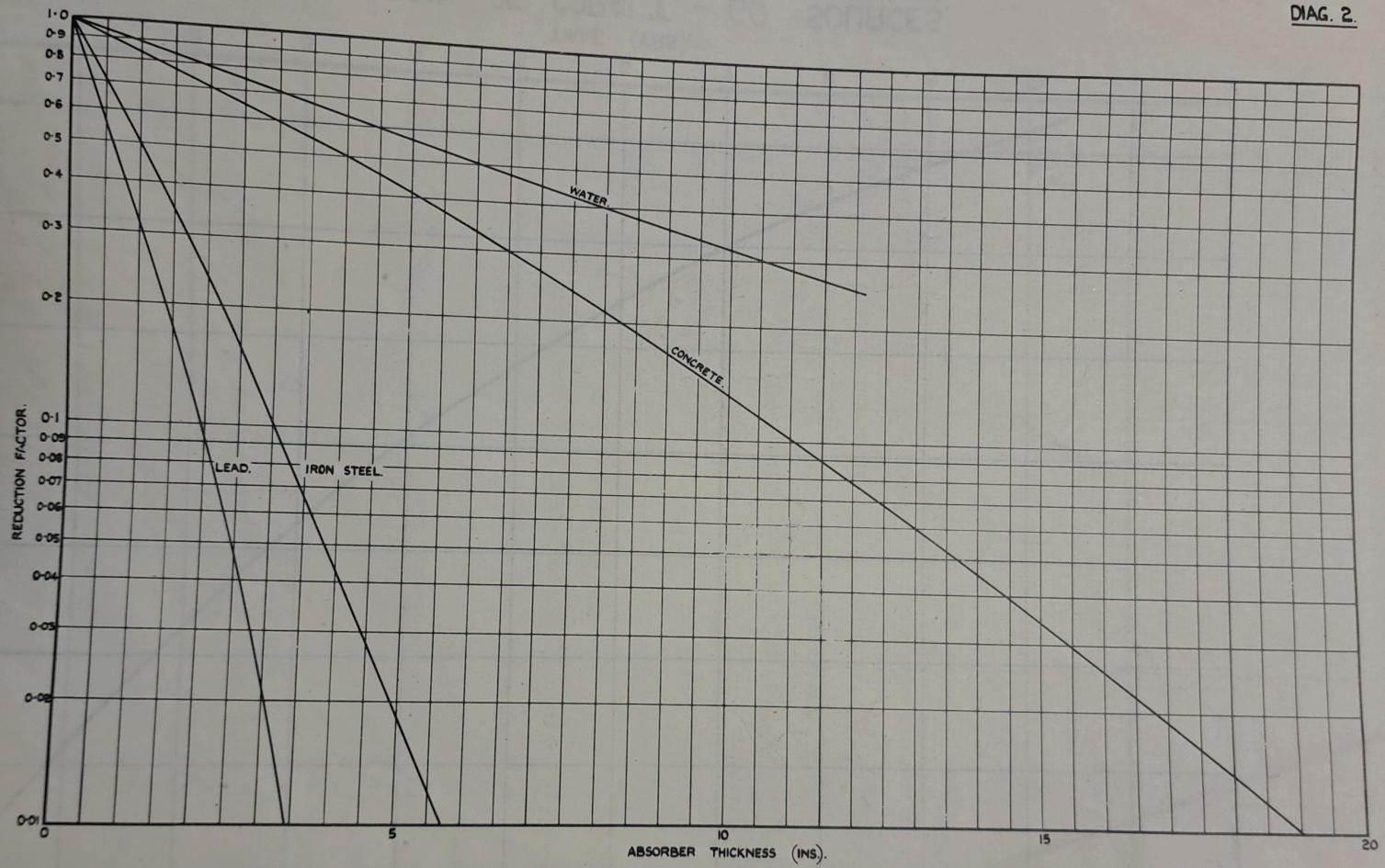

DIAGRAM 2. GAMMA RADIATION ABSORPTION.

6668

2-8 Richmond Terrace,
XXXXXXX

M.A.4

C.95567/57/M.A.4

27 November, 1957.

Sir,

Medical Examinations - Personnel exposed to Radiation
Range Support Unit, Maralinga

I am directed to refer to your letter HC/C.11898/10 Med. dated 18th November, 1957, on the above subject and to state that an amending letter has already been issued to cover the Consultant in Pathology's comment (a). In this same letter, the comment (c) is also covered, the normal standards being altered from those used by the Atomic Energy Authority to those used within the Royal Air Force.

2. I am to state that at present no action is being taken on comment (b) as the warning levels were quoted intentionally at the lower end of the normal range for neutrophils and leucocytes. It has been found that on occasions the maximum reading in a patient suffering from leucopenia may give readings which would appear to be low counts from normal blood. If such blood examinations are repeated within the next few days and at a different time of day the true picture can often be appreciated. For this reason it is considered that warning levels as stated fulfil a useful purpose.

I am, Sir,
Your obedient Servant,

(J. M. URQUHART)
Wing Commander
for Director of Hygiene and Research

The Air Officer Commanding in Chief,
Home Command,
Royal Air Force,
White Waltham, Berks.

A.176978/53

29/A
52A

From:- Major D.C. Dougherty, R.A.M.C.

Joint School of Chemical Warfare,
Winterbourne Gunner,
Salisbury,
Wiltshire

JSCW/DCD/DO

13 April, 1956

Dear Group-Captain Wilson

I found my visit to you both interesting and valuable. I enclose as you requested a copy of the list of questions and answers with a copy of the covering memorandum from the War Office, two copies of a table showing the residual value of dose of radiation over a period of 30 days to which Q.1X and the answer refer, and a further copy of the table from which the immediate whole body dose equivalent of an accumulated dose of radiation can be obtained.

2. I hope you will find these of value.

Yours sincerely,
D.C. Dougherty

Group-Captain J.S. Wilson, R.A.F.,
Deputy Director of Hygiene and Research,
Air Ministry,
London, S.W.1

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Calculation
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exposure to r

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exposure
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COPY

29/B

GRO 8040
Ext. 464

The Under Secretary of State (AMD 8),
The War Office,
LONDON, S.W.1.

Ref : 24/General/3598(AMD 8)

27 March, 1956.

Memorandum for :-

The Commandant,
Joint School of Chemical Warfare.
Winterbourne Gunner.

Subject : Conundrums

The answers to your conundrums which have been copied at Appendix 'A' to this memorandum are attached as Appendix 'B'.

(Sgd) ??????

Lt-Colonel,
Director-General,
Army Medical Services.

Calculation of the single whole body immediate dose equivalent of a total dose of radiation received as a result of continuous exposure to residual radiation.

Days of continuous exposure	Reduction factor
1	1
3	1.4
7	2
14	2.6
21	3

i.e. 300 r total dose accumulated over 21 days continuous exposure = 100 r immediate single dose, i.e. some may show early symptoms and all should be evacuated and have a long rest period.

Estimated residual value of the first dose during the next 30 days after exposure			
Days after exposure	Residual value	Days after exposure	Residual value
0	100 %	12	40 %
3	80 %	16	30 %
7	60 %	21	20 %
10	50 %	30	10 %

It should be noted that 10% of the original dose is a persistent residual effect.

Estimated residual value of the first dose during the next 30 days after exposure			
Days after exposure	Residual value	Days after exposure	Residual value
0	100 %	12	40 %
3	80 %	16	30 %
7	60 %	21	20 %
10	50 %	30	10 %

It should be noted that 10% of the original dose is a persistent residual effect.

COPY

Appendix 'A' 29c

SID

"CONUNDRUMS"

Introduction

The following questions apply to conditions of war. They are mainly concerned with the long term and cumulative effects of nuclear radiation and will have to "tie up" with any alterations in the thresholds and casualty effects tables.

As a background for these questions, it may be said that in talking to classified audiences it has become necessary to consider in some detail, the influence of the long term effects of radiation from the military point of view and also from the point of view of military and national health. This applies for training to both Army, Air Force and M.D.C.

Essentially this is the amount of residual damage likely to remain in the average healthy individual following a single immediate or residual dose. The amount of such damage an individual can be allowed to accumulate in war without a health risk in the face of further deliberate exposure, or without becoming partly or totally unfit for further service as a result of incidental immediate exposure with or without any residual exposure.

Immediate Gamma

I After what single whole body dose or accumulation of separate whole body doses is the damage :-

(a) sufficiently great to render a man unfit for further front line service ?

(b) sufficient to induce a genetic "risk" in the average healthy young male ?

II Assuming that the threshold dose for 100% casualties in 6 weeks is 200 r and that personnel subjected to this dose are worked hard, for how long must they be rested if they are relieved after 72 hours ?

III At what level can a single whole body dose be ignored for military purposes ?

IV Is it still approximately correct to state that an individual will be left with residual damage equal to 10% of the initial immediate dose ?

Residual - Gamma and Beta

V What is the maximum permissible dose ?

VI (a) What is the maximum permissible accumulated dose ?
(b) Is this based on genetic safety ?
(c) If so, is it the same as I(b) ?
(d) Or is it based on life span safety ?

VII Will the 10% rule still apply for assessing the residual damage for one operation in a R/A area. See IV ?

VIII In an emergency, by how much may the permissible dose be increased and by whom ?

IX May some indication be given as to how damage from an accumulated dose due to residual radioactivity can be roughly converted to an equivalent immediate whole body dose, with as many examples as possible.

X After reaching the permissible dose on one operation, for how long must the average healthy male be removed from R/A duty ?

XI If an average healthy male is exposed for both immediate and residual doses will this fact affect the permissible accumulated dose ?

XII How is chance exposure but particularly deliberate exposure to be recorded in war ?

Appendix 'B'

Answers to Appendix 'A'

Immediate Gamma

I (a) About 75 to 100 r. This dose will produce radiation sickness in about half the men exposed. It depends upon the military situation and whether radiation nausea and vomiting renders a man unfit for front line service.

By reference to Chapter 5 of Notes on Nuclear Warfare for Medical Officers it will be seen that much larger doses of radiation when fractionated or spread out may be considered equivalent to the figure quoted above.

(b) It is nearly impossible to give an answer to this question. Radiation damage to spermatocytes etc ranges from complete killing from high dosage (600 to 800 r) to chromosomal translocations and breakages at medium doses (200 to 300 r) and to gene mutations at low dosage. It is estimated that 40 r would double the natural mutation rate. But a single individual is of little consequence genetically, it is only if the whole army is considered in loco parentis that we might say that 40 r is significant.

II At least three months would be required even if no work were done immediately after irradiation, hence it is likely that the period would be more than three months.

III Up to including 25 r. This however cannot be ignored if there is a subsequent dose and should be included as a residual dose (see para 26 and table 8 of "Notes") in the cumulative total. Likewise gene damage and possible bone marrow damage may occur at 25 r.

IV Yes. It is still considered that 10% residual damage is left after one month (see Table 8 of "Notes").

Residual - Gamma and Beta

V This depends upon the dose rate. If immediately after the bomb, 25 r is the maximum permissible, if a few days later then the dosage permitted may be higher (see para 25, 26 and 27 of "Notes on Nuclear Warfare for Medical Officers").

VI (a) 200 r over a period of two years this may be given as 4 x 50 r every six months or as 8 x 25 r every three months.

(b) No. This is based upon general somatic effects of X radiation. Genetically it assumes that this dose would apply to less than 1% of the total population.

(c) No.

(d) Yes, this is one of the factors taken into consideration.

VII Yes.

VIII In an emergency the permissible dose may be increased by a factor of three, i.e. up to 75 r. It would be up to the Officer in command in consultati with his medical advisers to make the decision.

IX This is discussed in paras 26 and 27 of Notes on Nuclear Warfare for Medical Officers.

A series of examples based on Table 8 which is most likely to be of use in military practice where the dose rate will be variable and exposure will be intermittent is given below :-

/2.....

Day of Exposure and time in Days	Dose Received	Residual Dose
1	10a	10a
3	10b	8a
7	10c	6a + 8b
10	10d	5a + 6b + 8c
12	10e	4a + 5b + 6c + 9d
16	10f	3a + 4b + 5c + 6d + 8e
21	10g	2a + 3b + 4c + 5d + 6e + 7f
30	10h	a + 1.5b + 2c + 2.5d + 3e + 4f + 5g
60	0	a + b + c + d + e + f + g + h*

* This 10% of each dose as administered must be considered to be a persistent residual effect. By substituting actual doses in roentgen for the letters a to h a large series of examples may be rapidly constructed as desired.

X Three months.

XI Certainly. One must remember though, that the residual effect of the immediate dose decayed during the first month from 100% to 10% in accordance with the equation $d = do\ e - 0.75t$ where d is the residual effective dose at a time, t, in days up to three weeks from the original dose do, hence one should calculate the residual effective dose before adding further doses (see notes on nuclear warfare for medical officers Table 8).

XII This is a difficult enough procedure in peace time civilian practice. A method for use in the Army in war cannot be instituted until measurement of all individual dosages sustained by all personnel can be guaranteed.

46A

45A

R.A.F. Form 1150

MEMORANDUM

50A

A.162379/53/M.A.2

LOOSE MINUTE

D.D.P.(Pol)

Copy to: M.A.4 ✓

33A

1. Reference your loose minute 102/P.Pol. of 12th November 1957. A misunderstanding has arisen over the revision of the Travel Instruction. We are anxious to ensure that all officers are x-rayed before going overseas regardless of their destination.

2. May we suggest the following minor amendment to the first sentence of the proposal at paragraph 2 of your loose minute:-

"5. Medical examination (including blood examination of personnel posted to Maralinga), chest x-ray, inoculation, vaccination, etc. etc."

(R. O. YERBURY)
Wing Commander

M.A.2
22.11.57.

1010

...be noted that there is no ...level and rejection level figures.

I am, Sir,
Your obedient Servant,

(J. M. [illegible])
Wing Commander
for Director of Hygiene

46A

49A

R.A.F. Form 1150

MEMORANDUM

FROM M.A.U.

TO D.P.E. Eng 9

Tel. No. [illegible] Our ref. 29/67/Eng

Ext. 611 Date 2 Aug 43

Your ref.

Dated

SUBJECT: [illegible]

1. Wg Cdr Lucas rang me yesterday. He will write me in your name. The following have been

D. Eng 4
F 15
C.D.S.
Asst. Eng 5
M.A. 2
M.A. 3
Ass. Eng 3
Eng Mus 1
Ass Eng 1.
A.D.P.S.(P.M.)

2. You agreed to send a representative to the meeting in my office tomorrow to discuss what, if any, further general instruction may be required.

Signature of Sender [signature]

Name in Block Letters [illegible]

Rank/Appointment Wg Cdr M.A.U.

NOTES

1.—Continue overleaf if necessary, annotating "P.T.O.".
2.—This form is normally to be completed in manuscript.

390 25/BJ/20. Wt. 39025. 100M Pads. B.& S. 51-8501.

[illegible] figures have been [illegible] those [illegible] It will be noted that there is no [illegible] level and rejection level figures.

I am, Sir,
Your obedient [illegible]

46A

48A

45

W/C GE WOOLLCOMBE
S/L KW HOINES

LOOSE MINUTE

A.252894/56/Air Eng.4b

.A.4 ✓

Copy to: Rad.Eng.9

Health Control of ~~Aircraft~~ Workers with
X-Ray and Radio Active Materials

32A

Reference is made to your loose minute C.95567/57/MA.4 dated 12th November, 1957. The writer will attend the meeting at 14.00 hours on Tuesday, 26th November, 1957, in Room 330, Richmond Terrace, to consider what further action is required to confirm that all users of X-rays and radio-active materials are aware of the health hazards.

2. The existing Regulations issued on the subject by or on behalf of this Branch are as follows:-

A.M.O. A.18/55 - Storage and use of r/a sources installed in Aircraft and used in servicing certain equipment.

A.P.4555, Vol.1 - Radiac Instruments and Equipment Manual - Section 6. "Sources". Not yet written.

SD.0251A, Vol.1, Sect.3, Chapter 3,
SD.0251A, Vol.4, Part 6
} Cross refers to A.18/55.

3. In addition to the above, A.P.3158,Vol.2, Leaflet H/5 contains safety precautions for the handling of r/a Valves, which are the concern of D.Rad Eng. It is suggested that Rad.Eng.9 may have some interest in the meeting on 26th November, 1957.

W A Beedie

(W. A. BEEDIE)
Squadron Leader

Air Eng.4b
22.11.57
EMG

1037

...figures have been ...from those ...It will be noted that there is no ...level and rejection level figures.

I am, Sir,
Your obedient Servant,

46A

45A

Trafalgar 8811 Ext.6668
Correspondence on the subject of this letter should be addressed to:
THE UNDER SECRETARY OF STATE,
AIR MINISTRY, M.A.4
and should quote the reference:
C.95567/57/M.A.4

AIR MINISTRY,
2-8, RICHMOND TERRACE,
WHITEHALL,
LONDON, S.W.1.

25th November, 1957

Sir,

Medical Examinations - Personnel Exposed to Radiation, Range Support Unit, Maralinga

I am directed to refer to Air Ministry letter of even reference dated 31st October, 1957 on the above subject and to state that an undetected error was included in the table in paragraph 3. This table should therefore be cancelled and replaced by the following:-

	Normal Adult	Warning Level	Rejection Level
Neutrophils	2,500 - 7,500	3,000	2,000
Lymphocytes	1,500 - 3,500	1,000	750
Total Leucocytes	4,000 - 10,000	4,500	3,000
Abnormal Cells	Nil	Nil	Present

Normal for other cells: Monocytes 200 - 800; Eosinophils 200 - 400; Basophils 15 - 100

2. The original "normal" figures circulated were those used by the Atomic Energy Authority when examining personnel for employment in their establishments, as they show slight variations from those accepted as normal in the R.A.F., the R.A.F. figures have been substituted in the new table. It will be noted that there is no change in warning level and rejection level figures.

I am, Sir,
Your obedient Servant,

(J. M. URQUHART)
Wing Commander
for Director of Hygiene and Research

The Principal Medical Officers,
All Commands at Home,

The Senior Medical Officer,
No. 90 Group.

M.A.2

46A

45A

LOOSE MINUTE

A.252894/56/Air Eng.4b

E.18
M.A.4

Copy to: G.D.5a

Radiation Maximum Tolerance Doses

Paragraph 3 of your loose minute E.18/A.155598/53 dated 29th October, 1957 (not to M.A.4) will presumably be suitably actioned after the meeting called for 26th November, 1957 by M.A.4 in loose minute C.95567/57/MA.4 dated 12th November, 1957.

2. Reference para. 4 of your minute: Common practice appears to be to state doserate in roentgens per hour, or mr/hr, and where a distance is involved, the yard is usually quoted. The limit of 1 roentgen at 1 ft. per 24 hours laid down in A.P.830, Vol.2, Leaflet Q/1, would more commonly be quoted as 4.6 mr/hr at 1 yd. However, it is appreciated that the statement was probably chosen because it is a simple matter to position a Dosimeter 1 ft. from a stack of sources for 24 hours.

3. The choice of 1 ft. is probably satisfactory if each stack contains only sources of the same type and activity. Where a stack is of mixed sources, it is thought that a measurement at a greater distance than 1 ft. would be necessary to achieve accuracy. Perhaps M.A.4 would care to comment on the terms used in A.P.830, Vol.2, Leaflet Q/1, para. 19, and advise if any amendment is necessary.

Air Eng.4b
20.11.57
EMG

(W. A. BEEDIE)
Squadron Leader

Squadron Leader,
For Air Officer Commanding-in-Chief,
Home Command

The Under-Secretary of State,
Air Ministry (M.A.4),
2/8 Richmond Terrace,
Whitehall,
London, S.W.1.

CONFIDENTIAL

CONFIDENTIAL

45A

HC/C.11898/10/Med.

Headquarters Home Command,
Royal Air Force,
White Waltham,
Maidenhead, Berks.

18th November, 1957

AIR MINISTRY
20 NOV 57
DEPT. M.A.2.

Sir,

Medical Examinations - Personnel exposed to Radiation
Range Support Unit, Maralinga

I have the honour to refer to Air Ministry letter C.95567/57/M.A.4 dated 31st October, 1957 on the above mentioned subject and to forward the following comments by the Consultant in Pathology:-

(a) The differentiation between neutrophils and leucocytes is not only not understood, but is considered to be quite erroneous.

(b) With reference to the table, it is considered of questionable value to quote as a warning level, a figure within the quoted range e.g. Neutrophils and leucocytes.

(c) The Consultant in Pathology has also pointed out that the normal values quoted differ from those appearing in the R.A.F. Laboratory notes, and considers that the appearance of two sets of normals within the Medical Branch of the R.A.F. may be misleading.

I have the honour to be,

Sir,

Your obedient Servant,

(T.G.V. RODEN)
Squadron Leader,
For Air Officer Commanding-in-Chief,
Home Command

(a)(c) Abnormal Detected.

(b) Not agreed
? Typ level abnormal
or Low level normal
Report as check

The Under-Secretary of State,
Air Ministry (M.A.4),
2/8 Richmond Terrace,
Whitehall,
London, S.W.1.

CONFIDENTIAL

C.95567/57/M.A.4

LOOSE MINUTE C.68036/55/M.A.2

M.A.4

Your loose minute C.95567/57/M.A.4 dated 12.11.57 refers.

2. No regulations relevant to the health control of workers with radio active materials have been issued by M.A.2.

3. M.A.2 will be represented at the meeting on 26th November 1957.

for (R. C. ROBB)
Squadron Leader

M.A.2
20.11.57

Wing Commander
for Director of Hygiene and Research

Air Officer Commanding-in-Chief,
Bomber Command,

434

C.95567/57/M.A.4

LOOSE MINUTE

Lt. Rear, Air Task Force Grapple

Master Register of Radiation received by R.A.F. Personnel on Atomic Trials

Until now a record of radiation received by R.A.F. personnel employed on atomic trials has been maintained at A.W.R.E., Aldermaston. It has now been decided that a master register shall be maintained in the Directorate of Hygiene and Research which will be immediately available in Air Ministry.

2. Copies of A.W.R.E. records have been obtained but unfortunately in certain instances sufficient information is not recorded to prepare an accurate record.

3. It is requested that number and initials be supplied for the following personnel who received recorded doses of radiation on Operation Grapple:-

Flying Officer Perry (member of Sqn.Ldr. Bates' crew)

Squadron Leader N.S. Pouley

4. It has been observed that on occasion the spelling of surnames has not been absolutely accurate, it is possible that this may have happened in the two instances mentioned above.

(J. M. URQUHART)
Wing Commander

M.A.4
20.11.57

Wing Commander
for Director of Hygiene and Research

Air Officer Commanding-in-Chief,
Bomber Command,
Royal Air Force,
High Wycombe, Bucks.

424

6668

2-8 RICHMOND TERRACE

M.A.4

C.95567/57/M.A.4

20th November 1957

Sir,

Master Register of Radiation received by R.A.F. Personnel on Atomic Trials

I am directed to refer to the subject of recording of the radiation received by air force personnel who have assisted in atomic trials and to state that to date such records have been maintained as part of a composite record at the Atomic Weapons Research Establishment, Aldermaston.

2. It has now been agreed that a master register should be maintained in the Directorate of Hygiene and Research at Air Ministry for air force personnel. To this end a copy of all the relevant entries in the A.W.R.E. register have been received, unfortunately these records are incomplete, surnames showing minor errors in spelling and in many instances no number or initials being recorded.

3. A list of personnel who cannot be accurately identified from the information supplied is attached, I am to request that where possible further details be forwarded to this Directorate from your records.

I am, Sir,
Your obedient Servant,

(J. M. URQUHART)
Wing Commander
for Director of Hygiene and Research

Air Officer Commanding-in-Chief,
Bomber Command,
Royal Air Forde,
High Wycombe, Bucks.

Operation Totem

Wing Commander Anderson ✓

Operation Hurricane

Flight Lieutenant Blythe ✓
Squadron Leader Brown ✓
Wing Commander Garroway ✓
Wing Commander Humphrey ×
Flight Lieutenant Mercer ✓
Squadron Leader Mitchell ✓
Squadron Leader Prior (Pryer) ✓
Squadron Leader Skelly ✓
Warrant Officer Sparrow ✓
Flight Lieutenant Whitaker ✓

Operation Mosaic - Buffalo

Flying Officer Adams	(Canberra) ✓
Flight Lieutenant Baxter	(Varsity) ✓
Squadron Leader Boyd	(Canberra) ✓
Flight Lieutenant Brettell	(Canberra) ✓
Flight Lieutenant Burton	(Canberra) ✓
Flight Sergeant Barrell	(Whirlwind) ×
Flying Officer Clelland	(Canberra) ✓
Corporal Churchward	(Aircraft Decontamination) ✓
Flying Officer Digby	(Canberra) ✓
Flight Lieutenant Houghton	(Varsity) ✓
Corporal Jenkins	✓
Flight Lieutenant Love	(Canberra) ✓
L.A.C. Mackenzie	(Aircraft Decontamination) ×
Flying Officer Mann	(Canberra) ✓
Flight Lieutenant Moran	(Varsity) ✓
Flying Officer Pearson	(Canberra ?) ✓
Flying Officer Padley	(Varsity) ✓
Sergeant Peasey	(Whirlwind) ✓
Sergeant Prior	✓
Sergeant Reid	(Aircraft Decontamination) ✓
Flying Officer Robson	(Canberra) ✓
Flying Officer Wylie	(Varsity) possible.
Flying Officer Wilson	(Canberra) ✓
Corporal Williams	×
A.C. Wilson	(Aircraft Decontamination) possible.
Flight Sergeant Webb	✓
Master Pilot Wills	(Varsity) ✓

From: Wing Commander J. M. Urquhart, M.B., Ch.B., D.P.H.

Trafalgar 8811
6668

2-8 RICHMOND TERRACE

41A

Ref: C.95567/57/M.A.4 ✓

20th November 1957

Dear

Thank you very much for your prompt reply to my enquiry of 14th November. I have obtained a copy of the publication which you mentioned. My real problem was the clinical side as I have been out of hospital practise for so long and I was not certain of the technique of using istopes in therapy.

Yours

Dr. C. W. Wilson, Ph.D., M.Sc., F.Inst.P.,
Westminster Hospital,
Physics Department,
St. Johns Gardens,
S.W.1.

(T.B. WALKER)
Squadron Leader

E.18
19 November, 1957.

LOOSE MINUTE

P.M./1062

M.A.4.

Health Control of Workers with X-rays and Radio Active Materials

Reference your loose minute C.95567/57/M.A.4. dated 12th November, 1957, this directorate has not yet issued any instructions for R.A.F. Police in the use of X-rays.

A.D.P.S.(P.M.)
18 November, 1957

(H. MUNDY)
Wing Commander

937

Air Ministry Salvage Leaflet No.

LOOSE MINUTE

A.155598/53

M.A.4

Health Control of Workers with X-Ray Materials

1. Reference is made to your loose minute C.95567/57/M.A.4 dated 12 November.

2. We agree that the incorporation of instructions in a comprehensive publication is desirable and will arrange to attend the meeting on 26 November.

3. The publications which have been issued by D.G.E. are as follows:

A.P.830 Vol.2 Leaflet Q.1 Q.2.

Air Ministry Salvage Leaflet No.13 Issue No.1.

(W.S. NOCKLES)

E.18
18. November, 1957.

(T.B. WALKER)
Squadron Leader

E.18
19 November, 1957.

38A

LOOSE MINUTE

E.18/A.155598/53

M.A.4.
M.A.2.
M.A.3.
G.D.5.
Air.Eng.3
Eng.Plans.1
Air.Eng.1

Copy to: Arm.Eng.5

Health Control of Workers in X-Ray and Radio active Materials (23A)

1. Reference is made to your loose minute C.95567/57/M.A.4 dated 31 October, 1957, and the only comment we have to make relates to the last line of para.4 'Monitors 1257 and 1320'.

2. Both items are general health monitors which are held in very limited quantities in special areas of Bomber Command and Maintenance Command. The monitors have been provisioned only for special area use and it would not be possible to issue them for radiological survey as a general rule, but only in exceptional circumstances.

3. So far as we are aware there are no other types of 'counting' instruments available in the service but it is suggested that this be investigated with E.5b who provision general radiac instruments (Section 6Z) for passive defence purposes.

4. We do not know to what extent you will require this type of health instrument for radiological survey, but it is considered that special provision should be made for them in order not to embarrass the requirements of Monitors at the Special Storage Areas.

5. We understand that some commercial development is taking place on 'low-level' counters which may be much less expensive than the Monitors 1257 and 1320. Mr. Farningham of Ministry of Supply, A.D./L.P.M.4 is in touch with these developments and will be able to advise you.

(T.B. WALKER)
Squadron Leader

E.18
19 November, 1957.

91

36B

37A

WESTMINSTER HOSPITAL

(PHYSICS DEPT.)

ST. JOHN'S GARDENS, S.W.1

OUR REF.

YOUR REF. C. 95567/57/M.A.H. 36A

Telephone:
VICTORIA 6041
(Ext. 13)

Nov. 15th. 1957

Wing Commander J.M. Mogahert M.B., Ch.B., D.P.H.
Air Ministry
2-8 Richmond Terrace,
Whitehall, S.W.1.

Dear Dr. Mogahert,

I think that the most satisfactory way to answer your query regarding regulations for the clinical use of radioisotopes is to refer you to the recently published :- "Code of Practice for the Protection of Persons exposed to Ionising Radiations" published by H.M.S.O. 1957 from the Office of the Prime Minister and First Lord of the Treasury (Atomic Energy), the Ministry of Health, Dept. of Health for Scotland.

Part B of this publication is concerned with the "Use of radioactive isotopes" and additionally, a supplement includes a considerable amount of useful fundamental technical data.

Yours sincerely,
G. W. Welbourn

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to which personnel may be e
is as 0.1 roentgen per day and not more than 0.3 roentgen in any consecutive
period of seven days. These levels may only be exceeded

36B

Not to Encl 23A

From: Wing Commander J. M. Urquhart, M.B., Ch.B., D.P.H.

36A

6668 2-8 RICHMOND TERRACE

Ref: C.95567/57/M.A.4

14th November 1957

Dear

For the first time our clinicians have used radio active isotopes in the treatment of a patient at R.A.F. Hospital, Aden, and I find that we have no regulations for the safe handling of such isotopes in R.A.F. Hospitals. As it is probable that isotopes may be used again in any of our hospitals I should like to issue general regulations to all such units which they will have available whenever required.

I have sketched out some general points but I have not been in hospital practise for some years and have little to do with handling radio active isotopes; it is quite possible that I have missed some important precautions. Have you any standard regulations covering health safety when using radio isotopes in hospital practise and, if so, might I have a copy to check my draft?

Yours

Dr. C. W. Wilson, Ph.D., M.S.C., F.Inst.P.,
Westminster Hospital,
Horseferry Road,
S.W.1.

aximum Permissible Dosage

. The maximum permissible dosage of radiation to which personnel may be s
s as 0.1 roentgen per day and not more than 0.3 roentgens in any consecutive

1A3 Reply to Note End 23A

36B

M 182 IN A 160849/53 PT III

Para 11 Delete RPS submit A/cs to A.M.

Additional powers RADIO-ACTIVE MATERIALS for human application

"Requirements for R/A material for human application should be submitted to the Dept (M.O.H.)?"

Copies i/v & i/m

The Secretary
Clinical Advisory Panel (Isotopes)
M R C.
38 Old Queen St
London S.W.1

Extend.

Secretary
Tech Sub Committee of the Standing Advisory Committee on Cancer Radiotherapy
M of H
Savile Row
London S.W.1

Richmond Terrace,
LONDON. S.W.1.

..., M. B., D.P.H.,

852

...e materials to ...

...um Permissible Dosage

...he maximum permissible dosage of radiation to which personnel may be exposed ...

...0.1 roentgen per day and not more than 0.3 roentgen ...

...of seven days. These levels may ...

...the Director of ...

Wing Commander J. M. Urquhart, M.B., Ch.B., D.P.H.

35A

6668

2-8 RICHMOND TERRACE

Ref: C.95567/57/M.A.4

11th November 1957

Dear

I am at present making certain that all air force personnel who are liable to be exposed to radiation have a medical examination and the necessary blood examination beforehand, and I am finding this difficult for personnel posted to the various Air Task Groups formed for atomic trials. I understand from Wing Commander Murray (Ops.D.) that A.W.R.E. issues a "A.W.R.E. Requirement Plan" to each Task Force Commander when it is formed. Would it be possible to include a section in this laying down what medical and blood examinations are necessary?

The beginnings of these Task Forces are so often cloaked in secrecy that they are well under way before outside branches know that they have been formed and when I leave it is quite possible that my successor will not be as much in the picture as I have been. If this happens air force personnel might arrive at Maralinga or Christmas Island without the necessary examinations having been done. If the medical requirements are included in the A.W.R.E. Requirement Plan this difficulty should be avoided.

From our point of view if the aircrew and the ground crew, who are liable to be servicing aircraft, have a medical examination and full blood examination that will be sufficient but I gather from Dr. Whitmore that you prefer the whole Task Force to have these examinations. If this is so we would have no objection but I should like to know what exact instructions you have put in the Requirement Plan.

Dr. J. B. Lynch, M.B., Ch.B., D.P.H., D.I.H.,
Principal Medical Officer,
Atomic Weapons Research Establishment,
Aldermaston,
Nr. Reading, Berkshire.

/It

...Terrace,
LONDON. S.W.1.

852

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to which personnel may ... is as 0.1 roentgen per day and not more than 0.3 roentgen in any consec... period of seven days. These levels may only be exceeded with the direc... ment of the Director of Hygiene and Research ...

It may be of value to refer the Task Force Commander to Air Ministry letter C.95567/57/M.A.4 dated 1st November 1957 to all Principal Medical Officers, which lays down the blood standards required.

Hoping to see you in December when I hope to bring my successor to meet you all at Aldermaston.

Yours

From: Gp.Capt. R.F. Wynroe. M.B., Ch.B., D.M.R.E.

34A

X-Ray Department,
Princess Mary's R.A.F.
Hospital,
HALTON,
Nr.Aylesbury,
Bucks.

Ref: PMH/C.RFW.

November 1957.

Dear Urquhart

Health Control of Workers with X-Ray and
Radio Active Materials

28A

Thanks for your letter ref: C95567/57/MA4 of 5th.November. I would rather Air Commodore D.A. Wilson vetted this A.M.O. himself for it is such an important subject and one with which I have, outside medical work, little personal contact.

However, I can pass some comments which may or may not be helpful.

IN RAF

(1). In the opening sentence, X-rays never have been "limited to diagnostic and therapeutic radiography in hospitals": I am therefore aware that they can never be "no longer etc."

A suggested alternative is "The use of ionising radiations for non-medical purposes is extending rapidly. X-rays and radio-active materials are being used ------ "

(2). Are paras 9-24 meant to apply - as it would appear - to workers in medical X-ray Departments.? We wear film badges for two weeks, not one.

(3). I think paras 15-18 are too medically detailed for an A.M.O., though not full enough to be really helpful to a medical officer. Could not these paras be expanded and issued separately

.../for

Wing Commander J.M. Urquhart, M.B., Ch. B., D.P.H.,
Air Ministry,
2-8 Richmond Terrace,
LONDON.S.W.1.

852

active material is limited to the minimum required to carry out his task.

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to which personnel may be is as 0.1 roentgen per day and not more than 0.3 roentgen in any consecutiv period of seven days. These levels may only be exceeded with the direct a ment of the Director of Hygiene and Research, Air Ministry.

for inclusion in A.P.1269. I do not know if Supplement 6 to the B.J.R (Recommendation of the International Commission on Radiological Protection) or the M.R.C. Hazards to Man of Nuclear and Allied Radiations are available at Sick Quarters: it did take me some time to get these two important booklets for my own X-Ray Dept.

(4). Are routine blood counts much use? - I have stopped having them done. I limit counts to the pre-employment one, and to cases of known (or suspected) over-exposure. The reticulocyte count, done by an expert - as indeed all worthwhile blood counts should be - is of use in overexposure.

In general on the subject of protection in the R.A.F., I have found that whenever my interest in the subject has happened to stray beyond the confines of my own department I have been liable to be privately alarmed by what I discover - in both medical and non-medical spheres.

I do not think written regulations are of great value in dealing with something so intangible and unnoticeable as radiation. I feel that a rigid system of regular and surprise inspections (like those for the tangible non-public funds) of all establishments using ionising radiations - including medical units if need be - by an expert in the subject (not, repeat, not, the S.M.O. or D.P.M.O) must be evolved.

Yours sincerely

R. H. Mayneord.

Draft returned.

RHS

348

DRAFT A.M.O.

C.95567/57/M.A.4

Health Control of Workers with X-rays and Radio Active Materials

The use of X-rays is no longer limited to diagnostic and therapeutic radiography in hospitals. Radio active materials are being used for an increasing variety of purposes on R.A.F. stations. This Order consolidates and brings up to date the regulations for the control of the health of workers with radiation, details the method of recording dosage and lays down the limits of exposure which may be permitted without undue hazard.

General Control

2. X-rays and radio active materials are being employed in so many different ways on stations that it is impossible to lay down general safety regulations to cover all such procedures in this Order. The necessary regulations have been agreed for each use and are laid down in the relevant technical and training instructions or in Air Ministry Orders. It is the responsibility of the officer in charge of any section which uses x-rays or radio active materials to be conversant with the relevant safety regulations and to be certain that they are carried out when such x-rays plants or radio active materials are in use. He is responsible for ensuring that all personnel handling such x-ray plants or such radio active materials are aware of the hazards to themselves and to others and that they have read and understood the relevant safety regulations. As all radiations are harmful he is to take [redacted]e care to ensure that all exposure to x-ray or radio active material is limited to the minimum required to carry out his task.

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to which personnel may be exposed is as 0.1 roentgen per day and not more than 0.3 roentgen in any consecutive period of seven days. These levels may only be exceeded with the direct agreement of the Director of Hygiene and Research, Air Ministry.

4. Where equipment or material has been contaminated with radio active material the safe limits below which personnel may handle the equipment without hazard are, for fixed activity 50 counts per second and for loose activity 5 counts per second, the readings in each case being taken with A.E.R.E. type monitors 1257 or 1320.

Recording of Radiation Exposure

Radio Active Materials

5. All personnel working with radio active materials are to be equipped with a serviceable technical dosimeter (Section 62 11001) the use and reading of which must be understood by the worker.

6. A record (Army Form A20) is to be maintained of the radiation doses received by personnel using radio active sources. This record will be compiled immediately following the period of exposure and will show:

(a) the date and time at which the individual was exposed,

(b) the dose received as recorded by the dosimeter issued to the individual.

This record will be kept only when the radiation absorbed exceeds 50 milliroentgen in any one day.

7. The Army Form A20 is to be completed and submitted weekly to the Unit Medical Officer for inspection and signature.

8. Any person who is found to have been exposed to radiation in excess of 0.3 roentgen in any one period of seven consecutive days is to be instructed to report to the Unit Medical Officer.

X-rays

9. The officer in charge of a section where x-rays are employed is to ensure that all personnel regularly employed in the use, or in the vicinity, of an x-ray plant wear a photographic film badge whilst on duty for a period of one week in each quarter. Requests for film badges are to be made by the Unit Medical Officer to Air Ministry, [redacted] M.A.3, Richmond Terrace, Whitehall. After one week's exposure the badges are to be forwarded without delay to: The Radiological Protection Service, Downs Nursery Hospital, Cotswold Road, Sutton, Surrey, Telephone Vigilant 1329.

10. It is important that the film badges be worn at all times while on duty and that they be fixed beneath any protective clothing which may be worn when personnel are working with the x-ray plant.

11. Payment for the test films is to be made direct to the National Protection Service through the cash account of the Unit as for local purchases of medical equipment.

12. A report will be forwarded to the Unit giving all radiation recorded by the films.

Medical Examinations

13. The officer in charge of any section where x-ray plant or radio active sources are being used is to ensure that all personnel regularly exposed to radiation are referred to the Unit Medical Officer for medical examination before taking up such duties and at six monthly intervals thereafter whilst so employed.

14. The Unit Medical Officer is to ensure that all personnel referred to him for examination before working with x-rays or radio active materials are in good health and have undergone a blood examination.

15. Examination of the blood is to include red cell count, haemoglobin estimation and differential white cell count in total cells per cubic millimetre. A note is to be made of any abnormal cells.

16. Pre-employment blood counts on the borderline of abnormality may be repeated on one or two successive days or on intervals of a few days before any decision regarding fitness is made.

17. Provided health safety arrangements for both site and personnel are satisfactory routine blood examinations are to be carried out every six months. More frequent examinations will be required when these arrangements have been observed to have been unsatisfactory: when radiation absorbed by personnel has been above permissible levels: or when indicated by the intensity of the working programme or the state of health of any exposed individual.

18. The white cell count provides the only practical indication at present of sensitivity to ionising radiation but it will not in all circumstances give early warning of adverse biological effects. The following critical levels of white blood cells in total per cubic millimetre are accepted for guidance.

	Normal	Warning level	Rejection level
Neutrophils	2250 - 8200	3000	2000
Lymphocytes	1100 - 3800	1000	750
Leucocyte	4500	4500	3000
Total	12100		
Abnormal Cells	Nil	Nil	Present

TRAVEL INSTRUCTION
OVERSEAS POSTING — OFFICERS AND AIRMEN (AIRCREW)

Serial No. .....

Date ..... 19....

1.

Despatching		Receiving		A.M. and Other Addressees			
Unit	Command H.Q.	Unit	Command H.Q.	"P" Branch	Movts. Branch		

2. The under-mentioned is to proceed overseas on posting as shown above:—

Surname and Initials	Subs. Rank	Branch	Official Number	Post at new unit (if known)	Earliest Date for Movement	To arrive overseas by

3. Acting Rank of ..... is to be ..... w.e.f. ..... 19....

4. Remarks and Special Instructions: .....

.....

.....

.....

Form 1369.....

5. Medical examination, inoculation and vaccination are to be completed before the officer proceeds on embarkation leave. Yellow fever inoculation, if required, is to be carried out at the nearest Service centre. The officer is to carry all certificates of successful inoculations and vaccinations. In the event of an officer being found medically unfit, Air Ministry is to be informed by telephone IMMEDIATELY and confirmation is to be signalled.

6. Air Ministry (Movements) will issue instructions on date, place of departure and method of travel. When date of embarkation is known, a confirming posting instruction will be issued for record purposes.

Signature of Issuing Officer .....

Name (*in block letters*) .....

Rank ..... Tel. Ext. .....

Date .....

A.M. Form 1985.

*S.102/Gp.734/D.BK-2032-3-4-5/Wt.34643/MB(P)Ltd. 1,045 pads (4 sorts) (2) 6/57

PROVISIONAL WARNING OF POSTING — OFFICERS AND AIRMEN (AIRCREW) (OVERSEAS)

To: H.Q., ... Command
Two copies for notation and onward transmission to

Copy To: H.Q., ... Command

..... (*Present Unit*)

Date ..... 19 .....

Surname and Initials	Rank	Branch	Official No.	Present Post and Duties

1. The above-named is to be advised that he has been provisionally selected for posting to:—

Unit	Command	During month/year	For Duties

SPECIAL REMARKS:

2. This warning is intended to give advice of a tentative selection for posting and is not to be construed as a firm notice of posting.
3. Any circumstances likely to affect the implementation of the selection are to be notified IMMEDIATELY to the Air Ministry (Air Secretary), through Command Headquarters. Instructions giving effect to or amending this provisional warning will be issued in due course.
4. When action has been taken vide para. 1 above, the unit is to complete para. 5 below and return one copy of this paper to Air Ministry (P. Pol. 3), London, W.C.1.

Signature of Issuing Officer .....
Name (*in block letters*) .....
Rank ..... Tel. Ext. .....

FOR ACTION BY PRESENT UNIT

5. The above-named has been advised of his provisional selection for posting overseas. He has been medically examined and found ..... for service in ..... Command.

Unit ..... Signature .....

Rank ..... Date ..... 19 .....

A.M. FORM 1987.

*S.102/Gp.734/D.BK-2032-3-4-5/Wt.34643/MB(P)Ltd. 1,045 pads (4 sorts) (2) 6/57

32A

C.95567/57/M.A.4

LOOSE MINUTE

M.A.2
Air Inv.4
G.D.5
M.18
Arm.Inv.7
Air Inv.3
Inv.Plans 1
Air Inv.1
A.D.P.S.(P.M)

Health Control of Workers with X-rays and Radio Active Materials

This branch has circulated a draft Air Ministry Order on the above subject to all addressees within the last few days. Discussions, both in minutes and on the telephone, between various branches reveal that there is considerable uncertainty on the more general aspects of health control which are not mentioned in this Air Ministry Order. Whilst these precautions must have a common general basis they will show considerable variations in processes. One proposal is that all such regulations be contained in one Air Publication, which Air Publication has not yet been decided. Another proposal is that each user branch issue its own regulations in the appropriate Air Publication or user handbook.

2. To avoid excessive correspondence and in order that all interested parties may be able to discuss the subject in detail it is proposed to hold a meeting in Room 330, Richmond Terrace, at 1400 hours on Tuesday, 26th November 1957, to consider what further action is required to confirm that all users of x-rays and radio active materials are aware of the health hazards and what action is necessary to protect the health of the workers.

3. It is requested that branches notify this Directorate of any existing regulations which they may have issued in this connection in order that a composite list may be prepared for consideration by the meeting.

/4.

ed to

~~possible~~.

P28

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to whic

4. It is requested that addressees attend this meeting or send representatives.

(J. M. URQUHART)
Wing Commander

M.A.4
12.11.57

R.A.F. Form 1150

1

LOOSE MINUTE

A.252894/56/Air.Eng.4b.

M.A.4.

Copy to:- M.A.2.
M.A.3.
G.D.5a.
E.18.
Arm.Eng.7.
Air.Eng.3.
Eng.Plans.1.
Air.Eng.1c.

Draft Air Ministry Order - Health Control of Workers with X-rays and Radio-active Materials

The Draft A.M.O. forwarded with your loose minute C.95567/57/M.A.4 dated 31st October 1957 is agreed by Air.Eng.4a and 4b with the exception of the description of the Dosimeter used in Paragraph 5. The term "technical dosimeter (6Z/11001)" is not well-known in the Service and it is assumed that the Dosimeter referred to is that shown in A.P.1086 as "Dosimeter Quartz Fibre No.1 0 to 0.5 roentgen Stores Reference 6Z/9110001". It would be preferable to use the full description quoted in the stores vocabulary A.P.1086.

2. It is suggested that copies of the Draft A.M.O. be forwarded also to Air.Eng.1c who is concerned with the decontamination of aircraft and Air.Eng.3 and ~~Air.Eng.1~~ Eng.Plans.1 who are both concerned with the possible introduction of X-ray equipment for servicing aircraft.

W.A. Beedie Sqn Ldr.

(W.A. BEEDIE)
Squadron Leader

Air.Eng.4b.
8th November, 1957.
BH

P28

~~possible~~.

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to wh

exposed ~~has been laid down as~~ is 0.1 roentgen per day and

0.3 roentgen in any consecutive period of seven days.

agreement of the Dir

R.A.F. Form 1150

30A

C.95567/57/M.A.4

LOOSE MINUTE

Rear Headquarters,
Air Task Force Grapple

Copy to: Ops.(A.W.T.)

Medical Examinations - Atomic Weapons Trials

Certain personnel forming part of a task force to assist atomic weapons trials are liable to be exposed to radiation. It is necessary therefore to make sure before they leave this country that they are not suffering from any disease of the blood which might be aggravated by this exposure. No facilities are available in Christmas Island for this examination to be carried out there. It is therefore necessary for such personnel to have the examination before leaving this country.

2. The personnel at risk are the following:-

(a) All Canberra aircrew.

(b) All technical and other personnel employed in servicing Canberra aircraft.

3. It is requested that you issue instructions that all such personnel undergo a blood examination before leaving this country. Medical Officers should be referred to Air Ministry letter C.95567/57/M.A.4 dated 31st October 1957 which gives the standards below which personnel should not be accepted for this duty.

(J. M. URQUHART)
Wing Commander

M.A.4
8.11.57.

possible.

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to

MA4 File 29A

Memo from A20.

Is any interservices form yet in process of agreement.

---

para 6 (b) last sentence. How can tell in case of omission whether dose was just left out. (? too suspicious)

Para 9 - Implies anyone can work near an X ray plant if they wear a badge. ? only radiographers to be in vicinity of X ray plant - apart from patients being X rayed. Radiographers to wear film badges as stated.

Depts. Debt MA3 - is Dept the right word. - Govt Depts are ministries.

para 11 - If so, why not demand direct from R.P.S.?

A.F. Form

MEMORANDUM

Para 12 - ? add as last sentence To Para 9.

Para 14 - the blood exam must be satisfactory as well!

Para 20 - ? omit "in para 3"

Para 21 — Do we really want the Pmo notified if anyone gets 115 r in a day - why not if over .3 in the week?

Para 23 - ? necessary to keep individual exposure in 53Q. as well.

radiations are harmful

Form

R.A.F. Form 1150

MEMORANDUM

MOH

TO D of H+R

No. Our ref.

Date

Your ref.

Dated

SUBJECT: DRAFT DMO. Health Control RADIATION

Will you please consider the attached draft of a proposed D.M.O on the above subject At present the instruction which it covers me in 3 DMO's + innumerable AP's but only for certain specific duties & tasks. I have tried to make this draft all embracing & applicable to any new process which may be introduced.

After you have studied it I shall circulate to

MA2
G.O.S
AirEng 4(b)
E18
Consultant IN Physiology
MA3 etc

for comment

Signature of Sender

Name in Block Letters

Rank/Appointment

NOTES

1.—Continue overleaf if necessary, annotating "P.T.O.".
2.—This form is normally to be completed in manuscript.

390 25/BJ/20. Wt. 39025. 100M Pads. B.& S. 51-8501.

radiations are harmful ~~please~~ take ~~extreme~~ care to ensure exposure to x-ray or radio active material is limited to ~~possible~~ required. To carry out his task.

DRAFT A.M.O.

Health Control of Workers with X-rays and Radio Active Materials

The use of x-rays is no longer limited to diagnostic and therapeutic radiography in hospitals. Radio active materials are being used for an increasing variety of purposes on R.A.F. stations. This Order ~~consolidates and brings up to date the regulations for the control of~~ indicates the measures necessary to safeguard the health of those whose occupations expose them to dangerous radiation. ~~workers with radiation, details the method of recording dosage and lays down the limits of exposure which may be permitted without undue hazard.~~

General Control

2. X-rays and radio active materials are being employed in so many different ways on stations that it is ~~impossible~~ only to lay down general safety regulations to cover ~~all~~ such procedures in this Order. ~~The necessary~~ Additional instructions applicable to specific uses of radioactive materials ~~regulations have been agreed for each process and~~ are laid down in the relevant Publications. ~~relevant technical and training instructions or in Air Ministry Orders.~~ It is the responsibility of the officer in charge of any section which uses x-rays or radio active materials to be conversant with the relevant safety regulations and to ensure be certain that they are carried out when such x-ray plants or radio active materials are in use. He is responsible for ensuring that all personnel handling such x-ray plants or such radio active materials are aware of the hazards to themselves and to others and that they have read and understood the relevant safety regulations. As all radiations are harmful ~~please~~ he is to take ~~extreme~~ care to ensure that all exposure to x-ray or radio active material is limited to the minimum ~~possible~~ required. to carry out his task.

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to which personnel may be exposed ~~has been laid down as~~ is 0.1 roentgen per day and not more than 0.3 roentgen ~~a~~ in any consecutive period of seven days. These levels may only be exceeded with the direct agreement of the Director of Hygiene and Research, Air Ministry.

4. Where equipment or material has been contaminated with radio active material the safe limits below which personnel may handle the equipment without hazard are, for fixed activity 50 counts per second and for loose activity 5 counts per second, the readings in each case being taken with A.E.R.E./type monitors 1257 or 1320.

Recording of Radiation Exposure

Radio Active Materials

5. All personnel working with radio active materials are to be equipped with a serviceable technical dosimeter (Section 6Z 11001) the use and reading of which must be understood by the worker.

6. A record (Army Form A20) is to be maintained of the radiation doses received by personnel using radio active sources. This record will be completed immediately following the period of exposure and will show:

(a) the date and time at which the individual was exposed,

(b) the dose received as recorded by the dosimeter issued to the individual .

This record will be kept only when the radiation absorbed exceeds 50 milliroentgen in any one day.

7. The Army Form A20 is to be completed and submitted weekly to the Unit Medical Officer for inspection and signature.

8. Any person who is found to have been exposed to radiation in excess of 0.3 roentgen in any one period of seven consecutive days is to be instructed to report to the Unit Medical Officer.

X-rays

9. The officer in charge of a section where x-rays are employed is to ensure that all personnel regularly employed in the use, or in the vicinity, of an x-ray plant are to wear a photographic film badge whilst on duty for a period of one week in each quarter. Requests for film badges are to be made by the Unit Medical Officer to Air Ministry, M.A.3, Richmond Terrace, Whitehall. After one week's exposure the badges are to be forwarded without delay to: The Radiological Protection Service, Downs Nursery Hospital, Cotswold Road, Sutton, Surrey, Telephone Vigilant 1329.

10. It is important that the film badges be worn at all times while on duty and that they be fixed beneath any protective clothing which may be worn when personnel are working with the x-ray plant.

11. Payment for the test films is to be made direct to the National Protection Service through the cash account of the Unit as for local purchases of medical equipment.

12. A report will be forwarded to the Unit giving all radiation recorded by the films.

Medical Examinations

13. The officer in charge of any section where x-ray plant or radio active sources are being used is to ensure that all personnel regularly exposed to radiation are referred to the Unit Medical Officer for medical examination before taking up such duties and at six monthly intervals thereafter whilst so employed.

14. The Unit Medical Officer is to ensure that all personnel referred to him for examination before working with x-rays or radio active materials are in good health and have undergone a blood examination. ~~He is to raise and record such examinations on an Army Form A21~~.

15. Examination of the blood is to include red cell count, haemoglobin estimation and differential white cell count in total cells per cubic millimetre. A note is to be made of any abnormal cells.

16. Pre-employment blood counts on the borderline of abnormality may be repeated on one or two successive days or on intervals of a few days before any decision regarding fitness is made.

17. Provided health safety arrangements for both site and personnel are satisfactory routine blood examinations are to be carried out every six months. More frequent examinations will be required when these arrangements have been observed to have been unsatisfactory: when radiation absorbed by personnel has been above permissible levels: or when indicated by the intensity of the working programme or the state of health of any exposed individual.

18. The white cell count provides the only practical ~~investigation~~ indication at present of ~~necessity~~ sensitivity to ionising radiation but it will not in all circumstances give early warning of adverse biological effects. The following critical levels of white blood cells in total per cubic millimetre are accepted for guidance.

/Normal

	Normal	Warning level	Rejection level
Neutrophils	2250 - 8200	3000	2000
Lymphocytes	1100 - 3800	1000	750
Leucocyte	4500	4500	3000
Total	12100		
Abnormal Cells	Nil	Nil	Present

19. Personnel having blood counts at or below warning levels are not to be exposed to further radiation. When a reading of blood counts show an appreciable fall to near warning level it is to be repeated weekly and if the fall is progressive the individual is to be removed from exposure to radiation until further examination reveals fitness for duty.

Radiation Exposure in excess of the levels laid down ~~in paragraph 5~~

20. When an individual is found to have been exposed to radiation in excess of the weekly maximum permissible level of 0.3 roentgen he is to be removed from the risk of further exposure until the average weekly dose taken over a preceding thirteen weeks has fallen to 0.3 roentgen. If the amount of excess radiation has been small it may not therefore be necessary to remove the individual from duty which involves further exposure.

21. The Medical Officer is to notify the competent medical authority when personnel are exposed to radiation in excess of ~~the limits given in paragraph 5~~ 0.3R IN ANY period of seven days. A short report of the circumstances ~~or~~ AND of the action taken is to be sent to the competent medical authority with a copy to Air Ministry, Director of Hygiene and Research.

22. Similar action to paragraph 21 above is to be taken in the event of an unsatisfactory or doubtful blood test.

Documentation in Station Sick Quarters

23. A personal record of exposure to radiation Army Form A21 is to be raised by the Unit Medical Officer for all personnel under health surveillance ~~for health~~ whilst exposed to RADIATION This form, which is a confidential record, is to be maintained from the weekly record of individual dosimeter readings, Army Form A20, which is passed by the officer in charge of a section for scrutiny at the end of each week or from the records received to him

quarterly from the Radiological Protection Service.

24. Dates of medical examinations, periods of suspension from duty involving radiation and details of blood examinations, are also to be entered on the personal record card form, Army Form A21. When an individual leaves the Unit on posting his record card is to be given an enclosure number and placed in Form Med.4.

Personnel employed on atomic trials

25. This Order does not apply to personnel employed in air task groups or as members of scientific parties on atomic weapon trials. Special regulations have been issued to cover the health hazards of such personnel.

26. The Order does apply to personnel posted to the R.A.F. element of the Range Support Unit, Maralinga.

Form [illegible]

R.A.F. MESSAGE FORM (For use only in Air Ministry and Large Headquarters) NUMBER

From: Wing Commander J. M. Urquhart, M.B., Ch.B., D.P.H.

28A

6668 2-8 RICHMOND TERRACE

Ref: C 95567/57/MD4

5 November 1957

Dear

Health Control of Workers with X-ray and Radio Active Materials

In the absence of Air Commodore Wilson overseas I am sending you a copy of a draft A.M.O. which I have prepared concerning the health of workers with x-rays and radio active materials. Would you be good enough to give me your comments at your convenience also any suggestions for additions to the A.M.O.

As I am sure you are aware use of radio x-rays is no longer confined to hospitals, the provost branch are using them in Cyprus for customs examination and the technical branch are starting to use them industrially. Radio active materials are appearing both for training purposes and on the technical side in an increasing variety of forms and of course more and more people are having to handle, or at least know how to handle, the deterrent. Health regulations regarding these different processes are contained in a wide variety of Air Publications and Air Ministry Orders, each applying to one particular facet and each varying from the other in minor particulars. It is obviously impossible to cover all the health safety regulations but the medical standards, maximum permissible doses and methods of recording are common to all and I have brought them together in this Air Ministry Order.

Yours

Group Captain R.F. Wynroe, M.B., Ch.B., D.M.R.E.,
P.M.R.A.F. Hospital,
Halton, Wendover, Bucks.

EN CLAIR

NOTE :—Instructions for the use of message forms are contained in A.C.P. 121, A.P. 3184 and in the Air Ministry Office

	DATE	TIME	SYSTEM	OPERATOR		DATE	TIME	SYSTEM	OPERATOR
R					D				

Form

R.A.F. MESSAGE FORM

27A

LOOSE MINUTE

Ops.(A.W.T.)/S.4149/3106

M.A.4

Medical Examination -
Atomic Weapons Trials

24A

1. Thank you for your Minute C.95567/57/M.A.4 of 31st October. I agree that the responsibility for arranging examination of Air Task Group personnel should be left to the Headquarters Planning Staff formed for each particular operation.

2. It would however, I think, be as well to guard against this requirement being overlooked and perhaps M.A.4 will, when the time arives, issue general medical directions to the Planning Staff.

(D. J. CORBET)
Squadron Leader

Ops.(A.W.T.)
5th November, 1957.
SCP

EN CLAIR

182 775

Instructions for the use of message forms are contained

R.A.F. Form [illegible]

R.A.F. MESSAGE FORM (For use only in Air Ministry and Large Headquarters) NUMBER

26A

LOOSE MINUTE

A.252459/56/Pt.6/M.D.1

M.A.4.

Copy to: P(Pol)3a
Ops(A.W.T.)
M.A.2.

Airmen posted to Maralinga Range, Australia. 18A

I refer to your loose minute C.95567/57/M.A.4 dated 30th October, 1957. The draft note issued by Record Office to an airman's parent unit in U.K. posting him to Maralinga specifically states that the airman concerned is required for duty at Maralinga.

2. Provided, therefore, that Unit Medical Officers are aware that blood tests are necessary for all airmen selected for posting to Maralinga, there is no requirement for inserting blood test information on draft notes.

M.D.1.
7/11/57

(G.J. BELL)
Wing Commander

762

EN CLAIR

NOTE :—Instructions for the use of message forms are contained in A.C.P. 121, A.P. 3184 and in the Air Ministry Office Ma

R	DATE	TIME	SYSTEM	OPERATOR	D	DATE	TIME	SYSTEM	OPERATOR

R.A.F. Form [illegible]
(15465) Wt. 44364 54m Pads 6/52 D.L.

R.A.F. MESSAGE FORM

(For use only in Air Ministry and Large Headquarters)

NUMBER MAH

FOR SIGNALS USE

PRECEDENCE—ACTION	PRECEDENCE—INFO	DATE—TIME GROUP
[illegible]E	DEFERRED	171230 Z

MESSAGE INSTRUCTIONS

PREFIX — No. of Groups GR

SECURITY GRADE: UNCLASS

ORIGINATORS NUMBER: 7789/MAH

FROM AIR MINISTRY LONDON

TO ~~ATF ANTLER MARALINGA~~
CHRISTMAS ISLAND

INFO

~~From~~ FOR REXFORD WELCH FROM URQUHART.

REQUEST REPLY MY 1188 SEP 19 GIVING

PRESENT POSITION.

See ESA
IN C 98148/57

Page 1 of 1 Pages	Drafter's Name J. M. URQUHART	FILE	AUTHORISING OFFICER
	Branch MAH Tel. No. 6668	C.95567	Signature [signature] Rank/Status [illegible]

DEPARTMENTAL CIRCULATION :—

DESPATCHED
EN CLAIR

NOTE :—Instructions for the use of message forms are contained in A.C.P. 121, A.P. 3184 and in the Air Ministry Office Manual

FOR SIGS USE	R	DATE	TIME	SYSTEM	OPERATOR	D	DATE	TIME	SYSTEM	OPERATOR

[signature]
(J. M. URQUHART)
Wing Commander

24A

LOOSE MINUTE C.95567/57/M.A.4

Ops.(A.W.T.)

Medical Examination - Atomic Weapons Trials

Reference your loose minute S.4109/Ops.(A.W.T) dated 17th ~~April~~ October 1957 on the above subject. As you will have seen from my loose minute to the personnel branches, copy of which I sent to you, I have covered the question of medical examination for the Range Support Unit.

2. With regard to personnel on air task groups the problem is different in that only a limited number require medical examination - aircrew, regiment and technical personnel engaged in handling radio active aircraft and stores. I think that the simplest method of arranging for blood examination for such personnel is for this to be organised by each air task force when it is formed and before it leaves this country. Do you agree?

(J. M. URQUHART)
Wing Commander

M.A.4
31.10.57

accepted as normal in the ...
substituted in the new table. It will be ... there is no change in warning level and rejection level figures.

I am, Sir,
Your obedient Servant,

23A

LOOSE MINUTE C.95567/57/M.A.4

M.A.2
M.A.3
Air Eng.4a
Air Eng.4b
G.D.5a
E.18
Arm.Eng.7

Draft Air Ministry Order -
Health Control of Workers with X-rays and
Radio Active Materials

X-rays and radio active materials are being used for an increasing number of purposes in the Air Force. The health control medical examination and safety levels for these processes are scattered through a large number of Air Ministry Orders, Air Publications and policy letters. While basically in agreement there are minor variations between these instructions.

2. While the actual operating instructions for the control of health of workers must show considerable variation, depending on the use in which x-rays and radio active materials are employed, medical examination the recording of this examination and the maximum permissible levels are common to all existing and to any future procedures. For this reason a draft A.M.O. covering these aspects has been prepared by this branch.

3. Would you please consider this Air Ministry Order as it applies to the processes for which you branch is responsible and let me have any comments at your convenience.

4. I have tried to make as comprehensive a list of branches as possible but addressees may know of some other branch which is interested. If there are any such branches if this branch is notified a draft copy of the A.M.O. will be sent to them for comment.

(J. M. URQUHART)
Wing Commander

M.A.4
31.10.57

in their establishments, [illegible]
accepted as normal in the R.A.F., the R.A.F. figures [illegible] see
substituted in the new table. It will be noted that there is
change in warning level and rejection level figures.

I am, Sir,

M.A.4

Tel: Trafalgar 8811 Ext.6668
Correspondence on the subject of this letter should be addressed to:
THE UNDER SECRETARY OF STATE,
AIR MINISTRY, M.A.4
and should quote the reference:
C.95567/57/M.A.4

AIR MINISTRY,
2-8, RICHMOND TERRACE,
WHITEHALL,
LONDON, S.W.1.

25th November, 1957

Sir,

Medical Examinations - Personnel Exposed to Radiation, Range Support Unit, Maralinga

I am directed to refer to Air Ministry letter of even reference dated 31st October, 1957 on the above subject and to state that an undetected error was included in the table in paragraph 3. This table should therefore be cancelled and replaced by the following:-

	Normal Adult	Warning Level	Rejection Level
Neutrophils	2,500 - 7,500	3,000	2,000
Lymphocytes	1,500 - 3,500	1,000	750
Total Leucocytes	4,000 - 10,000	4,500	3,000
Abnormal Cells	Nil	Nil	Present

Normal for other cells: Monocytes 200 - 800; Eosinophils 200 - 400; Basophils 15 - 100

2. The original "normal" figures circulated were those used by the Atomic Energy Authority when examining personnel for employment in their establishments, as they show slight variations from those accepted as normal in the R.A.F., the R.A.F. figures have been substituted in the new table. It will be noted that there is no change in warning level and rejection level figures.

I am, Sir,
Your obedient Servant,

J. M. URQUHART)
Wing Commander
for Director of Hygiene and Research

The Principal Medical Officers,
All Commands at Home,

The Senior Medical Officer,
No. 90 Group.

Copy to: M.A.2

DRAFT A.M.O.

C.95567/57/M.A.4

Health Control of Workers with X-rays and Radio Active Materials

The use of X-rays is no longer limited to diagnostic and therapeutic radiography in hospitals. Radio active materials are being used for an increasing variety of purposes on R.A.F. stations. This Order consolidates and brings up to date the regulations for the control of the health of workers with radiation, details the method of recording dosage and lays down the limits of exposure which may be permitted without undue hazard.

General Control

2. X-rays and radio active materials are being employed in so many different ways on stations that it is impossible to lay down general safety regulations to cover all such procedures in this Order. The necessary regulations have been agreed for each use and are laid down in the relevant technical and training instructions or in Air Ministry Orders. It is the responsibility of the officer in charge of any section which uses x-rays or radio active materials to be conversa with the relevant safety regulations and to be certain that they are carried out when such x-rays plants or radio active materials are in use. He is responsible for ensuring that all personnel handling such x-ray plants or such radio act materials are aware of the hazards to themselves and to others and that theyve read and understood the relevant safety regulations. As all radiations are harmful he is to take [redacted] care to ensure that all exposure to x-ray o active material is limited to the minimum required to carry out his task.

Maximum Permissible Dosage

3. The maximum permissible dosage of radiation to which personnel may be is as 0.1 roentgen per day and not more than 0.3 roentgen in any consecu period of seven days. These levels may only be exceeded with the direc ment of the Director of Hygiene and Research, Air Ministry.

4. Where equipment or material has been contaminated with radio active ma the safe limits below which personnel may handle the equipment without haza for fixed activity 50 counts per second and for loose activity 5 counts per s the readings in each case being taken with A.E.R.E. type monitors 1257 or

Recording of Radiation Exposure

Radio Active Materials

5. All personnel working with radio active materials are to be equipped with a serviceable technical dosimeter (Section 6Z 11001) the use and reading of which must be understood by the worker.

6. A record (Army Form A20) is to be maintained of the radiation doses received by personnel using radio active sources. This record will be compiled immediately following the period of exposure and will show:

(a) the date and time at which the individual was exposed,

(b) the dose received as recorded by the dosimeter issued to the individual.

This record will be kept only when the radiation absorbed exceeds 50 milliroentgen in any one day.

7. The Army Form A20 is to be completed and submitted weekly to the Unit Medical Officer for inspection and signature.

Any person who is found to have been exposed to radiation in excess of 0.3 [illegible] in any one period of seven consecutive days is to be instructed to report to the Unit Medical Officer.

-ray

e officer in charge of a section where x-rays are employed is to ensure t
nnel regularly employed in the use, or in the vicinity, of an x-ray plant
notographic film badge whilst on duty for a period of one week in each
r. Requests for film badges are to be made by the Unit Medical Officer to
istry, Department M.A.3, Richmond Terrace, Whitehall. After one week's
re e badges are to be forwarded without delay to: The Radiological
rotection Service, Downs Nursery Hospital, Cotswold Road, Sutton, Surrey, Telephone
nt 1329.

t is important that the film badges be worn at all times while on duty and
ey be fixed beneath any protective clothing which may be worn when personnel
rking with the x-ray plant.

ment for the test film is to be made direct to the National Protection
hrough the cash account of the Unit as for local purchases of medical

12. A report will be forwarded to the Unit giving all radiation recorded by the films.

Medical Examinations

13. The officer in charge of any section where x-ray plant or radio active sources are being used is to ensure that all personnel regularly exposed to radiation are referred to the Unit Medical Officer for medical examination before taking up such duties and at six monthly intervals thereafter whilst so employed.

14. The Unit Medical Officer is to ensure that all personnel referred to him for examination before working with x-rays or radio active materials are in good health and have undergone a blood examination.

15. Examination of the blood is to include red cell count, haemoglobin estimation and differential white cell count in total cells per cubic millimetre. A note is to be made of any abnormal cells.

16. Pre-employment blood counts on the borderline of abnormality may be repeated on one or two successive days or on intervals of a few days before any decision regarding fitness is made.

17. Provided health safety arrangements for both site and personnel are satisfactory routine blood examinations are to be carried out every six months. More frequent examinations will be required when these arrangements have been observed to have been unsatisfactory: when radiation absorbed by personnel has been above permissible levels: or when indicated by the intensity of the working programme or the state of health of any exposed individual.

18. The white cell count provides the only practical indication at present of sensitivity to ionising radiation but it will not in all circumstances give early warning of adverse biological effects. The following critical levels of white blood cells in total per cubic millimetre are accepted for guidance.

	Normal	Warning level	Rejection level
Neutrophils	2250 - 8200	3000	2000
Lymphocytes	1100 - 3800	1000	750
Leucocyte Total	4500 - 12100	4500	3000
Abnormal Cells	Nil	Nil	Present

19. Personnel having blood counts at or below warning levels are not to be exposed to further radiation. When a reading of blood counts show an appreciable fall to near warning level it is to be repeated weekly and if the fall is progressive the individual is to be removed from exposure to radiation until further examination reveals fitness for duty.

Radiation Exposure in excess of the levels laid down in paragraph 3

20. When an individual is found to have been exposed to radiation in excess of the weekly maximum permissible level of 0.3 roentgen he is to be removed from the risk of further exposure until the average weekly dose taken over a preceding thirteen weeks has fallen to 0.3 roentgen. If the amount of excess radiation has been small it may not therefore be necessary to remove the individual from duty which involves further exposure.

21. The Medical Officer is to notify the competent medical authority when personnel are exposed to radiation in excess of the limits given in paragraph 3. A short report of the circumstances and of the action taken is to be sent to the competent medical authority with a copy to Air Ministry, Director of Hygiene and Research.

22. Similar action to paragraph 21 above is to be taken in the event of an unsatisfactory or doubtful blood test.

Documentation in Station Sick Quarters

23. A personal record of exposure to radiation Army Form A21 is to be raised by the Unit Medical Officer for all personnel under health surveillance whilst exposed to radiation. This form, which is a confidential record, is to be maintained from the weekly record of individual dosimeter readings on Army Form A20, ~~which is passed by officer in charge of a section for scrutiny at the end of each week~~ or from the records received quarterly from the Radiological Protection Service.

24. Dates of medical examinations, periods of suspension from duty involving radiation and details of blood examinations, are also to be entered on the personal record card form, Army Form A21. When an individual leaves the unit on posting his record card is to be given an enclosure number and placed in Form Med.4.

Personnel employed on atomic trials

25. This Order does not apply to personnel employed in air task groups or as members of scientific parties on atomic weapon trials. Special regulations have been issued to cover the health hazards of such personnel.

26. The Order does apply to personnel posted to the [illegible] element of the Range Support Unit, Maralinga.

22A

LOOSE MINUTE C.95567/57/M.A.4

Air Eng.4b
E.18
G.D.5a

Radio Active Materials - Service Regulations 20A

Please refer to G.D.5a's loose minute C.56380/53/G.D.5a dated 30th October 1957. You will have received at the same time as this minute another minute from this branch enclosing a draft Air Ministry Order covering certain aspects of the subject under discussion. The contents of this draft A.M.O. lay down regulations which must be common to all users of radio active materials or x-rays, no matter how used. Whilst there must be some common ground in the general control measures they will vary considerably from procedure to procedure and it would be very difficult to prepare an A.M.O. to cover them all without writing a text book on radiation safety.

2. In view of the above this branch feels that the draft A.M.O. covers as much of the field as can be made comprehensive. However we are quite willing to co-operate in preparing:

(a) a further Air Ministry Order covering the other aspects of the subject,

(b) adding additional paragraphs to the draft A.M.O. which we have prepared.

(J. M. URQUHART)
Wing Commander

M.A.4
31.10.57

[illegible], Maralinga, to have a complete blood examination before [illegible] personnel posted to the eaving the United Kingdom. This examination should include red cell coun aemoglobin estimation and differential white cell count in total cells per ubic millimetre. A note should be made of any abnormal cells. A record f this examination is to be included in F.Med.4 in the normal way.

The following critical levels of white blood cells in total per [illegible]

A.F. Form 2008

4

From:- Headquarters No. 90 (Signals) Group

To:- Royal Air Force Newmarket (Attention Officer Commanding)
Royal Air Force Watton (Attention Senior Medical Officer)
Royal Air Force Bishopbriggs, Chigwell, Digby, Haydock, Norton, Pucklechurch, Stanbridge, Wythall (Attention Officer in Medical Charge)
Royal Air Force Medmenham (Attention Officer in Medical Charge), and for Royal Air Force Barkway, Bulbarrow Hill, Clee Hill, Daventry, Folly, Malvern, Stenigot, West Prawle, Worth Matravers

Date:- 5th November, 1957

Ref:- 90G/5002/Med.

Medical Examinations - Personnel exposed to Radiation
Range Support Unit, Maralinga

1. The subjoined copy of Air Ministry letter C.95567/57/M.A.4 dated 31st October, 1957 is forwarded for information and necessary action.

Below warning level
Above rejection "
1 mean lymphocytes + eosinophiles
1 " " only.

M.E.G. Sherwell

(M.E.G. SHERWELL)
Squadron Leader,
for Senior Medical Officer
No. 90 (Signals) Group

"I am directed to refer to personnel who are posted to the Range Support Unit at Maralinga, South Australia, and to state that as Maralinga Village is near the atomic weapons testing ground, personnel posted to this establishment are liable to be exposed to the effects of radiation. It is therefore essential to make sure that no disease of the blood exists before personnel are posted to this Unit.

2. I am to state that no facilities for blood counts exist at Maralinga and that arrangements will have to be made for all personnel posted to the Range Support Unit, Maralinga, to have a complete blood examination before leaving the United Kingdom. This examination should include red cell count, haemoglobin estimation and differential white cell count in total cells per cubic millimetre. A note should be made of any abnormal cells. A record of this examination is to be included in F.Med.4 in the normal way.

3. The following critical levels of white blood cells in total per cubic millimetre are forwarded for guidance.

	Normal	Warning level	Rejection level
Neutrophils	~~2250 - 8200~~ 500 7,500	3000	2000
Lymphocytes	~~1100 - 3800~~ 1500 3500	1000	750
Leucocyte	~~4000 4500~~ 10,000	4500	3000
~~Total~~	~~12100~~		
Abnormal Cells	Nil	Nil	~~Present~~ NIL

Normal for other cells Monocytes 200 - 800
Eosinophiles 200 - 400
Basophiles 15 - 100

4. I am to state that this requirement is being brought to the notice of the appropriate personnel branches. I am to request that the information be brought to the attention of all Medical Officers. "

...the notice
...that the
...ficers. "

Telephone Whitehall 6811 Extn. 6668

AIR MINISTRY,
2-8, RICHMOND TERRACE,
WHITEHALL,
LONDON, S.W.1.

Correspondence on the subject of this letter should be addressed to:
THE UNDER SECRETARY OF STATE,
AIR MINISTRY, M.A.4.
and should quote the reference:-
C.95567/57/M.A.4

31 October, 1957

Sir,

Medical Examinations - Personnel exposed to Radiation
Range Support Unit, Maralinga

I am directed to refer to personnel who are posted to the Range Support Unit at Maralinga, South Australia, and to state that as Maralinga Village is near the atomic weapons testing ground, personnel posted to this establishment are liable to be exposed to the effects of radiation. It is therefore essential to make sure that no disease of the blood exists before personnel are posted to this Unit.

2. I am to state that no facilities for blood counts exist at Maralinga and that arrangements will have to be made for all personnel posted to the Range Support Unit, Maralinga, to have a complete blood examination before leaving the United Kingdom. This examination should include red cell count, haemoglobin estimation and differential white cell count in total cells per cubic millimetre. A note should be made of any abnormal cells. A record of this examination is to be included in F.Med.4 in the normal way.

I have the honour to be,
Sir,
Your obedient Servant,

The Principal Medical Officers,
All Commands at Home.

The Senior Medical Officer,
No. 90 Group.

Copy to: M.A.2

80/53/G.D.5a

M.Os.

drafted

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be
been

Min. of
Encl.

(J. E. MACARTHUR)
Wing Commander
for Director of Hygiene and Research

4. [illegible]
of the
inform

Sec 47A

3. The following critical levels of white blood cells in total per cubic millimetre are forwarded for guidance.

	Normal	Warning level	Rejection level
	2500 - 7500		
Neutrophils	2250 - 8200	3000	2000
	1500 - 3500		
Lymphocytes	1100 - 3800	1000	750
~~Leucocyte~~	4150 - 13,000		
~~Total~~	~~12100~~	4500	3000
	4 000 - 10000		
Total			
Abnormal Cells	Nil	Nil	Present

4. I am to state that this requirement is being brought to the notice of the appropriate personnel branches. I am to request that the information be brought to the attention of all Medical Officers.

I am, Sir,

Your obedient Servant,

ADULT.

Monocyte 200 - 800
Eosin 200 - 400
Basoph 15 - 100

(J. E. MACARTHUR)
Wing Commander
for Director of Hygiene and Research

A.F. Form 2008

16774 2 A)

LOOSE MINUTE

C.56380/53/G.D.5a

Air Eng.4b

Copies to: E.18
M.A.4 ✓

Radioactive Materials - Service Regulations

1. Please refer to your loose minute A.252894/56/Air Eng.4b dated 3rd October 1957, about the tolerance doses prescribed in relevant A.M.Os.

2. A.M.O. A.51/53 is to be replaced. A replacement Order is being drafted and it will, among other things, contain the amendment you requested.

3. A.M.O. A.91/53 has been cancelled. The instructions previously contained in that Order have been incorporated in A.P. 830, Volume II (2nd Edition), Leaflet Q.1.

4. The reason for the issue of several sets of instructions appears to be a result of the different purposes for which radioactive materials have been introduced into the Royal Air Force. These purposes include:-

(a) The storage and use of radioactive sources installed in aircraft and used for servicing certain equipment (A.M.O. A.18/55 refers).

(b) The storage and use of radioactive sources issued for passive defence training (A.M.O. A.51/53 refers).

(c) Instructions for the bulk of storage, and transportation of radioactive materials (A.P. 830, Volume II (2nd Edition), Leaflet Q.1 refers).

(d) Precautions to be observed when storing and transporting sources, radioactive, Thallium 204 (A.P. 830, Volume II (2nd Edition) Leaflet Q.2 refers).

(e) The categories of personnel qualified in the use, care and storage of radioactive training aids (A.M.O. A.267/56 refers).

5. As there is considerable duplication of rules in the instfuctions referred to at para. 4 above, I agree with you that the possibility of producing a comprehensive Order should be examined. The basis of such an Order would appear to be Leaflets Q.1 and Q.2 of A.P.830 which contained the regulations for the storage and transportation of radioactive materials.

6. On the subject of the comprehensive Order, the views of E.18 and M.A.4 would be appreciated.

(E.L. McMULLEN)
Squadron Leader

G.D.5a
30th October 1957

R.A.F. FORM ...

COPY

From:- Headquarters Maintenance Command

To:- Air Ministry, M.A.4

Date:- 18th November, 1963

Ref:- MC/C.52400/3/Med.

A.M.O. A.107/63
Medical Examinations - Radiation Workers

1. A request for advice has been received from the Officer Commanding, Joint Services Bomb and Missile Disposal School, copy of letter attached.

2. As this unit is administered by the Army, it is submitted that it is a matter of some delicacy to insist on the medical examination and procedures as laid down in paragraphs 11 - 14 of A.M.O. A.107/63.

3. As far as can be traced, the current procedure laid down by the Medical Directorate of the Army is in Medical Administrative Instruction 68/61, which tallies with A.M.O. A.129/58 in respect of the requirement for six monthly blood examinations.

4. Your guidance would be appreciated.

Original signed: J. F. Sandow

(J. F. SANDOW)
Group Captain
for Air Officer Commanding-in-Chief
Maintenance Command

R.A.F. FORM 1150

MEMORANDUM

98A 99A 101A

C O P Y

JOINT SERVICES BOMB & MISSILE DISPOSAL SCHOOL
Broadbridge Heath Camp,
Nr. Horsham, Sussex.

Tel: Horsham 3382 Ext 3

Ref: JSBDS/859

6 Nov 63

Air Officer Commanding,
Headquarters,
Maintenance Command,
(Attention of PMO please),
Royal Air Force,
ANDOVER, Hants.

Medical Examinations - Ionizing Radiations - AMO A107/63

Advice is sought on the requirements of the subject AMO.

Personnel of this establishment, which is army administered, work with ionizing radiations. Recently a request was made to the Queen Alexandra Military Hospital for the annual check of personnel working with ionizing radiation to be carried out.

I personally attended and a sample of my blood was taken. I saw no one else other than the RAMC corporal who took the blood sample. I enquired about a medical examination but was told this was not necessary. The procedure was the same for my Chief Technicians.

Further to this, one of my army officers for whom I specifically requested an initial examination was subjected only to having a blood sample taken.

I feel that the attention given to this matter was not in accordance with the requirement of paragraph 11 of the subject AMO.

If this is so perhaps it would be preferable if the RAF medical authority assumed the responsibility for the control of RAF members of this establishment.

Original signed: John A. Reed

Squadron Leader
Officer Commanding
Joint Services Bomb & Missile Disposal School
(J. A. REED)

R.A.F. FORM ...

COPY

From:- Headquarters Maintenance Command

To:- Air Ministry, M.A.4

Date:- 18th November, 1963

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A.M.O. A.107/63
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4. Your guidance would be appreciated.

Original signed: J. F. Sandow

(J. F. SANDOW)
Group Captain
for Air Officer Commanding-in-Chief
Maintenance Command

24A

25A

26 A

MEDICAL CONFIDENTIAL

SBI

MEMORANDUM

From: Air Ministry (Wpn.Eng.10),
Whitehall,
S.W.1

To: Senior Medical Officer,
Air Ministry Unit,
High Holborn.

Our Ref: Wpn.Eng.10/B.F.4

Tel: Trafalgar 8811
Ext. 7220

Copy to: D.D.Med.Org.
on file C.95567/57/Pt.II

Date: 20th June, 1961

Squadron Leader R. E. W. Nettley (3046112) G.D./P.

1. We spoke today about this officer at present posted to R.R.E. Malvern.

2. He was admitted to R.A.F. Hospital Cosford after an accident early this year where he was found to have "a low activity marrow picture". His F.Med.4 contained enclosures which referred to a possible undue radiation exposure while serving on exchange with the R.A.A.F. during operation Totem. The question arose as to whether his marrow picture might be associated with this alleged exposure.

3. On checking with A.W.R.E. records I find that it is unlikely that he received a dose in excess of ·1 r since they have no record of him on their files and at that time did not maintain negative records.

4. I examined his F.Med.4 and came to the conclusion that his trouble in Australia was more likely to have been a psoriasis of his finger nails and not a result of radiation exposure.

5. It seems too that the marrow picture found at Cosford was, on reflection, more likely to have been associated with his injury as a post traumatic anaemia and I consider that an enclosure should be made in his F.Med.4 to the effect that there is no record of any undue radiation exposure in his past history.

D. Sturrock.

(D. STURROCK)
Squadron Leader
for Director of Weapons Engineering

MEDICAL CONFIDENTIAL

94A
25A

MEDICAL CONFIDENTIAL

LOOSE MINUTE

Wpn.Eng.10 B.F.4

D. of H. & R.

Re: Sqn.Ldr. R.E.W. Nettley (3046112) - GD/P

1. I spoke to you about this officer who was admitted to Cosford after an accident and found to have anaemia and a "low activity marrow picture". His F.Med.4 contained enclosures gained while in Australia serving with the R.A.A.F., suggesting that he had an undue radiation exposure on Operation 'Totem'. Naturally the hare was raised that there might be an association between his past history and his then present anaemia.

2. I asked A.W.R.E. if they could give me a note as to his recorded exposure on 'Totem'. Their answer is that they have no record of him as at that time they did not keep negative records for those who received less than 0.1r and so the presumption is that this was the order of the dose that he received.

3. I examined his F.Med.4 and enclosures suggest that his trouble in Australia was more of a psoriasis, which involved his finger nails: coming so recently after 'Totem' the radiation aspect was raised and remains on record.

4. Subsequent to his admission to Cosford his blood picture returned to normal and I believe the feeling is that it was a post traumatic type of anaemia.

5. You might like to consider whether a note should be made in his F.Med.4 of this assessment, for future peace of mind.

D Sturrock.

(D. STURROCK)
Squadron Leader

Extn: 7220
Wpn.Eng.10d
2nd June, 1961
EE

MEDICAL CONFIDENTIAL

101