

APPENDIX 1 TO
ANNEX D TO
OP ORD 1/73
DATED 25 JUN 73

RADIOLOGICAL PROTECTION

Air Sampling

1. Two portable air samplers (complete with filters) will be provided by the National Radiation Laboratory, and are to be read by using Radiac Set MD2.
2. The background level of natural radiation (before detonation of a nuclear device) is to be determined by the NRL Radiation Officer, and he is to take readings at 24 hour intervals prior to detonation.
3. After the detonation of any nuclear device air samples are to be taken at intervals not exceeding one hour, until all danger of radioactive fall-out is over.

Sampling of Fresh Water, Sea Water and Food

4. Sampling of sea water, fresh water and food is to be carried out by the NRL radiation officer at his discretion, using Radiac set MD2 with accessory kit MK7 NAK.

Personal Protection

5. The ship will be supplied with the following:

<u>Item No.</u>	<u>Pattern No.</u>	<u>Description</u>	<u>Quantity</u>
1	-	Dosimeter, Thermoluminescent (consisting of badge holder and TLD disc) with spare discs.	248
2	NRL Supply	Dosimeter, film badge	30
3	0552/900-7557	Dosimeter, quartz fibre, 0.200mR. As available	
4	0552/911-0101	Dosimeter, quartz fibre No.2A, 0-5r.	"
5	0552/911-0003	Dosimeter, quartz fibre No.3, 0-50r.	"
6	RNZNH Supply	Tablets, potassium iodide, 200-300mgm.	1000

6. The items in paragraph 5 above are to be issued as follows:

Item 1. To all members of the ship's company and all passengers. They are to be worn at all times whilst in the test area, pinned outside clothing on the left breast, or worn around the neck on a cord.

- Item 2. To all passengers and selected members of the ship's company. Selection should cover the ship, with emphasis on personnel who normally work on the upper deck and in engine room compartments. Badges are to be worn as for Item 1 above.
- Items 3. To be worn by selected members of the ship's company
4. 5. and selected passengers, as for Item 2 above. No person is to carry more than one pocket dosimeter.
- Item 6. At shelter stations, when ordered, following detection of radiation significantly above background level. They are to be swallowed immediately on issue.
7. All personal dosimeters are to be numbered and the numbers recorded against those to whom they are issued.

Reading of Personal Dosimeters

8. If the presence of fall-out or direct radiation above background level is detected, by air samples or otherwise, following the detonation of a nuclear device, the following readings are to be taken and recorded:
- a. 25 in number TLD's (Item 1) selected from throughout the ship, but particularly from those who were on the upper deck or in engine room compartments. These will be read by the NRL Radiation Officer, using Thermoluminescent Dosimeter Disc Reader MK 2NDR.
 - b. All pocket dosimeters (Items 3-5).

Subsequent Action

9. If dose rates significantly in excess of natural background level of radiation, or in any case before the level of 20 millirads per hour is detected:
- a. The ship is to go to shelter stations and pre-wet and follow the normal procedures for clearing a fallout area.
 - b. 25 selected TLD's, and all pocket dosimeters are to be read at half-hourly or hourly intervals, depending on the rate detected. All readings are to be recorded. Any person who has received a dose approaching 3 rem, or more, to the whole body is not to be allowed subsequently into any area where dose rates exceeding 20 millirads per hour are present.
10. In the following circumstances, full details are to be reported to CNS by "operational immediate" message.
- a. Any significant increase in radiation level above natural background.

- b. When any personnel have received a whole body dose of more than 3 rem.
 - (1) If any individual dose is in the range of 25-100 rem, further instructions are to be specifically requested.
 - (2) If any individual dose exceeds 100 rem, the French authorities are to be contacted without further instructions, and arrangements made for the earliest evacuation of the personnel concerned to the French hospital at HAO.

11. As far as possible, exposure of personnel to radiation is to be limited so that the total accumulated whole body dose does not exceed 3 rem over the whole period the ship is in the test area. This is the maximum permissible whole body dose in a three month period, for New Zealand civilians who are exposed to ionizing radiation in the course of their employment.

12. Fission products in the form of radioactive fall-out should be washed away as soon as possible. If adherence of radioactive material to parts of the ship prevents reduction of activity to a level below 20 millirads per hour, boundaries are to be marked and personnel warned not to loiter in the area.

Additional Equipment

13. A list of additional radiac and protection equipment being supplied is at Appendix 2.

Note: Certain Service Radiac instruments are graduated in Roentgens (R), instead of rads(r). The Roentgen(R), rad(r) and rem may be considered as identical units when referred to radiation doses to the body.

APPENDIX 2 TO
ANNEX D TO
OPORD 1/73
DATED 25 JUN 73

LIST OF ADDITIONAL RADIAC AND PROTECTION
EQUIPMENT AND ANCILLARIES

<u>Pattern No.</u>	<u>Description</u>	<u>Quantity</u>
0552/117-6663	Disc Reader Mk 2 NDR	1
0443/220-1351	Nitrogen Cylinder	1
Local Supply	Nitrogen Cylinder, charged with 220 cu ft oxygen-free dry nitrogen	1
-	Pressure Reducing Valve Type RR 8011, 0-30 PSI, with Cylinder Contents Gauge, Upstream Pressure Gauge and 4mm Tail Pipe (for Nitrogen Cylinders)	1
0552/521-5885	Radiac Set MD 2	3 (or 4) (See Note (2))
0552/114-9290	Accessory Kit Mk 7 NAK	1
0552/109-4747	Contamination Monitor Mk 3 NRM	1 (OTAGO only. See Note (1))
0552/911-0004	Dosimeter Charging Unit	As Required
8415/99-122- 6631	Suits, Decontamination NBC	20
0243/521-9459	Foam Nozzle and Hose Assembly	2
0473/224-0437	Acetamide Powder, Technical	4 tins
0473/211-2324	Citric Acid, Granules	4 tins
BR 2053(8)	Handbook for Radiac Set MD 2	1+
BR 2053(11)	Handbook for Thermoluminescent Dosimeter Disc Reader Mk 2 NDR	1
Dockyard Manufacture	Low Level Dose Rate Detector Head for use with Indicator Unit of Contamination Monitor Mk 3 NRM	1 (OTAGO only. See Note (1))
-	Personal Dosimetry Equipment	See Appendix 1

<u>Pattern No.</u>	<u>Description</u>	<u>Quantity</u>
NRL Property	Air Sampler, 12 Volt DC	1)
NRL Property	Air Sampler, 230 Volt AC	1) See Note (2)

- NOTES: (1) This instrument is not required in CANTERBURY. The Indicator Unit in conjunction with Dockyard manufactured low-level detector head mounted on GDP will perform the same function as the low-level dose rate detection system of SIRS.
- (2) This instrument will also be used by the NRL Radiation Officer for testing air samples, in conjunction with NRL Air Samplers.

Address all communications to
The Director.
Telegraphic Address:
Xray, Christchurch.

In your reply quote reference

19/8

17 JUL 1973



DEPARTMENT OF HEALTH
NATIONAL RADIATION LABORATORY

P.O. Box 25099,
Victoria Street.

108 Victoria Street, Christchurch C.I. New Zealand

Telephone 65 079

Due it under? 12 July 1973

The Secretary,
Ministry of Defence,
P.O. Box 295,
WELLINGTON.

Attention: Commander D. Nelson

Radiation Monitoring on the Frigates

1. After trying all day yesterday, I eventually managed this morning to contact Mr McCahon on the "Otago". The reception was very poor but I gathered that he was happy to continue in the job for some time and will therefore be prepared to transfer to H.M.N.Z.S. "Canterbury" on its arrival. I said that if it appeared that the exercise was continuing for some period, Mr Astley would be sent up to relieve him, possibly leaving here towards the end of the month. May I assume that if you find that the surveillance by the frigate is likely to extend well into August, you will alert us as early as possible so that Mr Astley can be prepared to undertake the relief. In an earlier telephone conversation, you suggested 27 July as a possible leaving date.
2. The badges for the TLD discs were received here yesterday. They have been prepared, loaded, and together with other dosimetry devices Mr McCahon required, have been passed on this morning to Lt. Cdr. Knight for despatch to the Commander of the "Canterbury". We now hold the remainder of the badges, about 400 in number, and I would suggest that these remain with us in the meantime. It would seem likely that a further prepared batch of about 250 should be sent with Mr Astley. This would allow a reading to be taken on the set worn by the crew of the "Canterbury" up to the time of Mr Astley's taking over from Mr McCahon. I think both the captain and Mr McCahon would like to have the dosage assessment available at that time. In order for us to be able to do this, we will require about 200 more TLD discs. I understand that after the first loading, Mr McCahon took all the discs with him to Auckland. Before he sailed, he arranged for the return of about 300 of these discs to us, which allowed the filling of the second batch, and we have about 70 left over. It seems likely that the remaining 400 or 500 discs were left with the appropriate officer in Auckland. If you agree with the proposal to supply a third batch, could you arrange for 200 of the discs to be sent to us from Auckland. It is of course possible that Mr McCahon took some or all of the remaining discs with him on "Otago". If this is the case, it may be difficult for you to arrange for them to be returned here in time for filling before Mr Astley's departure. In such a case, it would be necessary for Mr Astley to take with him 250 badges and for Mr McCahon and him to process and load them on the ship.

A. J. ...
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OWE
P/A

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3. I have sent this morning airmail, a letter to the Secretary of Defence requesting assistance in the delivery of a gamma-ray monitoring instrument to Penrhyn. The instrument itself has been prepared and packed and passed on to Lt. Cdr. Knight with the request that he forward it on when he receives a signal from the Ministry.

H. J. Yeabsley

(H.J. Yeabsley)
Director

... de
McCahon and him to process and load them on the ship. 250 badges and for Mr

062/6/31

.../2

1	ORIGINATOR'S INITIALS		
2	BEFORE SIGNATURE	to	
3	PER SIGNATURES	by	DONS (2)
4	BEFORE DISPATCH	to	
5	DISPATCH	Date	initials
		26.10.73	P.B
6	AFTER DISPATCH	to	ADN (2)
7	BEING UP	on	to
8	FILE	Date	initials
		26.10.73	

NA 062/6/31

24th October 1973

Mr J.F. McCahon
 National Radiation Laboratory
 P.O. Box 25099
 Victoria Street
 CHRISTCHURCH

VOYAGES TO MURUROA OF HMNZ SHIPS
OTAGO AND CANTERBURY

Reference: 19/8 dated 10 September 1973.

1. Receipt of the reference is acknowledged.
2. It is also confirmed that the corrected version of your report has been received.
3. Thank you very much for the information supplied.

(Sgd.) N. D. Anderson
 (N.D. ANDERSON)
 Commodore, RNZN
 for Secretary of Defence

DISPATCHED
 No. 6

Address all communications to
The Director,
Telegraphic Address:
Xray, Christchurch.

In your reply quote reference

19/8

RECEIVED
12 SEP 1973
P.B.



DEPARTMENT OF HEALTH
NATIONAL RADIATION LABORATORY

P.O. Box 25099,
Victoria Street.

108 Victoria Street, Christchurch C.1, New Zealand

Telephone 65 039

10 September 1973

The Chief of Naval Staff,
Defence Headquarters,
P.O. Box 292,
WELLINGTON.

VOYAGES TO MURUROA OF "OTAGO" AND "CANTERBURY"

The report referred to in my memo of 23 August gave results of personal dosimetry measurements using the naval TLD dosimeter equipment. Although there were difficulties in the use of this equipment under ship-board conditions, the results indicated doses below the minimum which this equipment could detect. The film type dosimeters supplied by this Laboratory have now all been evaluated, and confirm that no dose from external ionising radiation to any of the people monitored exceeded the minimum detectable dose for these dosimeters - 12 millirad. Thirty such dosimeters were distributed to a representative sample of the ship's company on "Otago", particularly those most likely to be exposed in the event of radioactive contamination. One of these was issued to Mr Colman. On "Canterbury" 65 dosimeters were issued to a representative sample of the ship's company.

In particular, the dosimeter issued to Mr Colman and used both on "Otago" and "Canterbury" shows less than 12 millirad. The results from each ship have been sent to the respective Commanding Officers.

The remaining equipment associated with the thermo-luminescent dosimeter disc reader Mk2NDR- unused badges and used discs - have now been returned to the N.B.C.D. school H.M.N.Z.S.Philomel.

My memo of 23 August and the accompanying corrected version of my report were addressed to "The Chief of Naval Staff, Ministry of Defence, P.O. Box 295, Wellington". I see, from a recent memo, that the box number for the Chief of Naval Staff should be 292.

However, since 295 appears, from other correspondence, also to be a Ministry of Defence box, I presume that the memo and report will have reached you.

- ① Please draft letter acknowledging receipt of this letter and X X
- ② Extract info re Mr Colman J. F. McCahon & draft a letter to him with these details (J.F. McCahon) c/c. Minister of Defence.

(A)

ADD
DAE 20
SOB (S/NBCs)
DCNS 8/10
HON 19/10

162/6/31

Address all communications to
The Director
Telegraph Address
New, Christchurch

In your only post office

19/8

1234P 10/7

P.B



DEPARTMENT OF HEALTH
NATIONAL RADIATION LABORATORY

P.O. Box 2309,
Victoria Street.

108 Victoria Street, Christchurch C.I., New Zealand

Telephone 63679

10 September 1973

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ADON
D. A. 20
9
306 (S.M.C.S.)
DCNS 8/10
AON 19/10

① Please draft letter acknowledging receipt of this letter and X X
② Extract info re Mr Colman J. F. McCahon
& draft a letter to him with
③ these details (J.F. McCahon)
et

NA 06216/31

The Minister of Defence

VOYAGES TO MURUROA OF HMNZ SHIPS
OTAGO AND CANTERBURY

1. Mr J.F. McCahon of the National Radiation Laboratory Christchurch has now reported that the dosimeters supplied by his Laboratory for use on board HMNZ Ships OTAGO and CANTERBURY during their deployment to Mururoa have all been evaluated, and it is confirmed that no dose from external ionising radiation to any of the people monitored exceeded the minimum detectable dose for these dosimeters, i.e. 12 millirad. Thirty such dosimeters were distributed to a representative sample of the ship's company on OTAGO, particularly those most likely to be exposed in the event of radioactive contamination. A dosimeter was also issued to Mr Colman. On CANTERBURY, 65 dosimeters were issued to a representative sample of the ship's company, including Mr Colman. ~~Also~~ ^{all of} ~~these persons~~

2. In particular, the dosimeters issued to Mr Colman and used both on OTAGO and CANTERBURY shows less than 12 millirad.

3. A ^{suggested} proposed letter to Mr Colman is enclosed for your ^{signature} consideration.

(J.F. Robertson)
Secretary of Defence

File

DRAFT

The Minister of Immigration

VOYAGES TO MURUROA OF HMNZ SHIPS
OTAGO AND CANTERBURY

For your information, Mr J.F. McCahon ^{from} of the National Radiation Laboratory Christchurch ^{who was on board "Otago Canterbury"} has now reported that the dosimeters supplied by his Laboratory for use on board ~~HMNZ~~ ^{the ships} Ships ~~OTAGO and CANTERBURY~~ during their deployment to Mururoa have all been evaluated, and it is confirmed that no dose from external ionising radiation to any of the people monitored exceeded the minimum detectable dose for these dosimeters, i.e. 12 millirad.

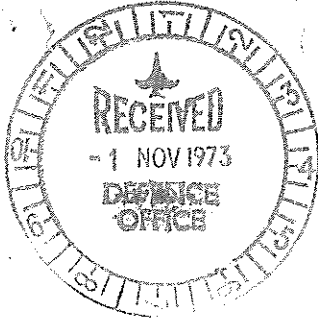
I am sure you will be pleased to know that
In particular the dosimeter issued and used by you ^{that} both on OTAGO and CANTERBURY shows less than 12 millirad.

(A.J. Faulkner)
Minister of Defence

File

Date Typed : 30 October 73

File No. : NA 062/6/31



1 November 1973

The Minister of Immigration

VOYAGES TO MURUROA OF HMNZ SHIPS
OTAGO AND CANTERBURY

Mr J. F. McCahon from the National Radiation Laboratory, Christchurch, who was on board "Otago" and "Canterbury" has now reported that the dosimeters supplied by his Laboratory for use on board the ships during their deployment to Mururoa have all been evaluated. It is confirmed that no dose from external ionising radiation to any of the people monitored exceeded the minimum detectable dose for these dosimeters, i.e. 12 millirad.

I am sure you will be pleased to know that the dosimeter issued and used by you both on "Otago" and "Canterbury" shows less than 12 millirad.

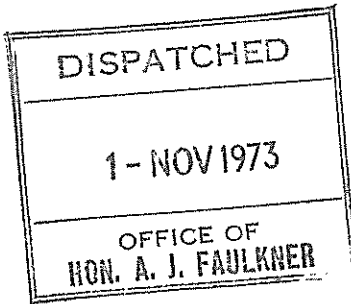
(Sgd.) A. J. FAULKNER

(A. J. Faulkner)
Minister of Defence

REFERRED TO
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NA 062/6/31

FILE -



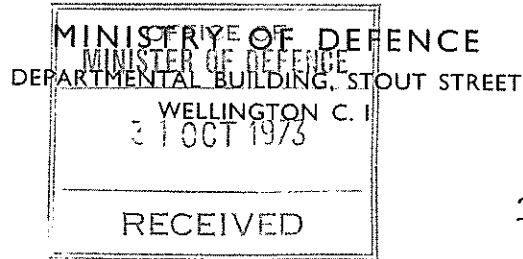
All correspondence should be addressed to
THE SECRETARY OF DEFENCE,
G.P.O. BOX 295, WELLINGTON.



In reply please quote:

Def. NA 062/6/31

Telephone: 49 800



31 October 1973

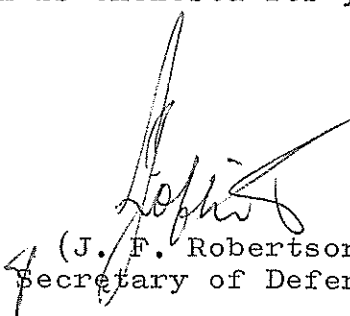
The Minister of Defence

VOYAGES TO MURUROA OF HMNZ SHIPS
OTAGO AND CANTERBURY

1. Mr J. F. McCahon of the National Radiation Laboratory, Christchurch, has now reported that the dosimeters supplied by his Laboratory for use for the detection of radiation effect on people on board HMNZ Ships OTAGO and CANTERBURY during their deployment to Mururoa have all been evaluated. It is confirmed that no dose from external ionising radiation to any of the people monitored exceeded the minimum detectable dose for these dosimeters, i.e. 12 millirad. Thirty such dosimeters were distributed to a representative sample of the ship's company on OTAGO, particularly to those most likely to be exposed in the event of radioactive contamination. A dosimeter was also issued to Mr Colman. On CANTERBURY, 65 dosimeters were issued to a representative sample of the ship's company, including Mr Colman.

2. All of the dosimeters issued to these persons and used both on OTAGO and CANTERBURY shows less than 12 millirad.

3. A suggested letter to Mr Colman is enclosed for your signature.


(J. F. Robertson)
Secretary of Defence

Encl:

MINUTE

NA 062/6/31

Naval Staff

Sec *Def*

VOYAGES TO MURUROA OF HMNZ SHIPS
OTAGO AND CANTERBURY

Reference: Mr J.F. McCahon's letter 19/8 dated 10 September 1973

1. The enclosure is referred for information.
2. A proposed report to the Minister of Defence together with a draft letter from the Minister of Defence to the Minister of Immigration are attached for consideration.

N.D. Anderson

(N.D. ANDERSON)
Commodore, RNZN
DCNS

24 Oct 73

- Enclosures:
1. Mr J.F. McCahon's letter 19/8 dated 10 September 1973.
 2. Draft report to Minister of Defence.
 3. Draft letter to Minister of Immigration.

File