

DRB 105-15/0

DIRECTORATE OF CENTRAL REGISTRIES

MEMORANDUM

DRB 351-2-1 (DCR)

(1) TO: PA CORB.

Date: 6. Jan 66.

RECORDS RETIREMENT

Retention Periods

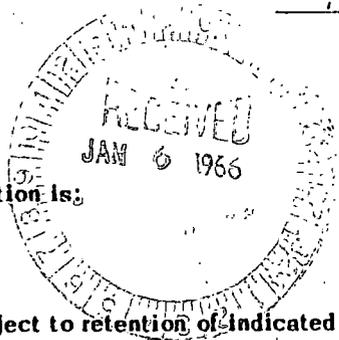
1. The Director of Central Registries is responsible for the retirement disposition of NDIQ records which have no administrative, fiscal, legal, historical, research or scientific value. Formal authority for disposal is obtained on submission to the Public Records Committee and the Treasury Board.

2. A survey of record holdings indicate that there is/are 1 file-drawer(s) of the file DRS 101-15 dealing with NATO - file series Disengagement volumes(s)

and dating from Jan. 19 59 to Apr. 19 59

3. This office recommends that a 5 year retention period be concurred in for these records. Correspondence of a policy or precedent nature will be retained.

M. G. Lafoley
For (J. Cardillo)
Director
Central Registries



(2) DGS:

B.F.
1 Jan. 68.

My recommendation is:

- (a) Concur: Yes No
- (b) Concur subject to retention of indicated records which must be retained:

(c) The complete records must be retained for the following reasons:
review on _____ Date: _____

The subject of disengagement recurs every so often in the NATO context. These papers may be useful back ground material.

Date: 4/2/66. Signature: [Signature]
PA CORB.

(3) DCR:

I concur and approve Minute (2).

Date: 4/2/66 For: [Signature]
Chairman, Defence Research Board

FILE NO.....

NOTE FOR FILE

THIS FILE TO BE USED FOR REFERENCE PURPOSES
ONLY.

FURTHER CORRESPONDENCE WILL BE PLACED ON
FILE.....

RECORDS MANAGEMENT SECTION

DATE..... JUN 17 1974

DEFENCE RESEARCH BOARD



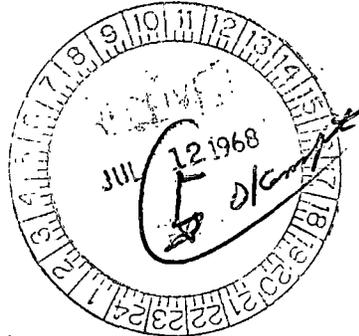
CONSEIL DE RECHERCHES POUR LA DÉFENSE

DEPARTMENT OF NATIONAL DEFENCE
MINISTÈRE DE LA DÉFENSE NATIONALE
CANADA

~~CONFIDENTIAL~~ ATTS.
~~RESTRICTED~~ with *Comp* 15/7/68

CANADIAN ARMAMENT RESEARCH AND
DEVELOPMENT ESTABLISHMENT
P.O. Box 1427, Québec, P.Q.

CENTRE CANADIEN DE RECHERCHES ET
PERFECTIONNEMENT DES ARMES
C.P. 1427, Québec, P.Q.



9 July 1968

Chairman,
Defence Research Board,
OTTAWA, Ontario.

Referred to...
JUL 12 1968
File No. *223-108-15/68*
Chgd. to...

Incident - Methyl Alcohol

Mr. [REDACTED]

s.19(1)

1. Further to recent telephone conversation Mylett - Humphrey, attached is a self explanatory report from our Mr. W. Butler on the marginally noted incident.
2. Mr. Butler is still working on this and hopes to come up with more information shortly. It is amazing how short-lived some memories can be.
3. The doctors concerned have reported to Mr. Butler that [REDACTED] is permanently blind.

① A/CDRB - *Employee*

② C of P - *Discussed with D.P.S.*

To note, please, and return to me.
W. G. Mylett
Att.
Comp
15/7/68

W. G. Mylett
(W.G. Mylett)
For Director-General

④ Discussed with Ellsworth of GEC Branch who suggested CARDE submit a Workman's Compensation claim on this case. R. Tanteau advised
K09
23/7/68.

Ⓟ

MEMORANDUM

~~CONFIDENTIAL~~
~~RESTRICTED~~
W.D./D. [unclear]
157/68

TO: Head of Technical Administration
FROM: Safety & Security Officer
SUBJ: Illness

CARDEC: [redacted]
DATE: 3 July 68

s.19(1)

.....

1. On 25 June 68, Nurse C. Morin, inquired if I had heard that Mr. [redacted] was seriously ill in the intensive care ward of the L'Enfant Jesus Hospital. When I replied negatively, she informed me that there was a strong possibility of Mr. [redacted] losing his sight because of some alcohol that he had drunk. She also advised me that a rumour was spreading that he had obtained the alcohol at CARDE. She was unable to confirm this rumour, as Mr. [redacted] was too ill to inform the medical staff at the hospital where he had obtained it.

2. Subsequent inquiries by Nurse Morin with the medical staff at the L'Enfant Jesus Hospital led me to believe that the alcohol had been obtained outside of CARDE.

3. On Thursday, 27 June 68, I informed RCMP Inspector Quintal of the incident.

4. On Friday, 28 June 68, RCMP investigators Bérubé and Ethier visited me following their interview with Mrs [redacted]. Mrs [redacted] informed them that Mr. [redacted] had obtained some alcohol at CARDE, and that Messrs [redacted], [redacted] and [redacted] were cognizant of this fact.

5. I advised the investigators of the information I had obtained, and asked if they had spoken to Mr. [redacted]. They advised they had not spoken to him, but wished to know if we had any alcohol on the premises which Mr. [redacted] would have access to. I advised that Mr. [redacted]'s occupation takes him to all corners of the establishment and that there is alcohol and alcohol based solutions used in many laboratories and work shops.

6. Investigator Bérubé reported this to his supervisor, Sgt Plante, and was advised to cease his investigation. However, at my request, Bérubé and Ethier visited Mr. [redacted] at the hospital and advised me that Mr. [redacted] claimed to have obtained a typewriter cleaning fluid that was used by Mr. R. Godbout.

7. I was unable to reach Mr. Godbout until approximately 2030 hours Friday 28 June 68, as he was absent on Annual Leave. Mr. Godbout, who lives in Loretteville, offered to drive his car to CARDE and obtain the bottle he thought Mr. [redacted] was referring to and bring it to my home. However, on his arrival at CARDE, he was unable to locate the bottle. It was learned, through Mr. G. Walling, that the bottle had been placed in a cabinet, and Mr. Godbout did not have the combination for the lock.

~~CONFIDENTIAL~~

~~RESTRICTED~~

*WQA D/Compt
15/7/68*

8. A sample was taken from the bottle 2 July 68 and sent to:-

Dr. Guy Bertrand
Hôpital de L'Enfant Jésus
Laboratoire de Gastro-Entérologie
Québec, P.Q.

9. Nobody that I have spoken to has seen Mr. [REDACTED] taking any liquid from this bottle. Mr. [REDACTED]'s work schedule for Thursday, 20 June 68 was as follows:-

s.19(1)

<u>WORK ORDER</u>	<u>DETAIL</u>	<u>TIME</u>
4380	To change fluorescent lights Calibration Lab Bldg. 15.	1 hr.
4407	To change lights in Bldg 58	2 hrs
4401	To change fluorescents in Bldg 58	1 hr.
4394	To repair interrupter and change fluorescent lights Bldg 15	2 hrs
4404	To change lights in Bldg 25A	1 hr.
4399	To change fluorescent in Bldg 64	1 hr.
TOTAL:		8 hrs

10. It will be noted that his work detail did not require him to be in Bldg 65, where the bottle of alcohol is used. However, Mr. Godbout reports that on Thursday, 20 June, Electrician [REDACTED] and his helper, [REDACTED], were working on a switch in Bldg 65. They were having difficulty in affixing a name plate, and Mr. Godbout cleaned the area with the alcohol they normally use in their spirit lamp. While he was in the process of putting the bottle away, he recalls that Mr. [REDACTED] came through their workshop and, seeing him with the bottle, asked him what it was. Mr. Godbout replied "Alcohol", and continued on his way to replace the bottle under the sink in the "Plate-making Room".

11. The bottle, referred to above, contains methyl alcohol and is issued from our Propulsion Division Store in 1 gallon and 1/2 gallon quantities. Mr. R. Martin recalls that he obtained a 1/2 gallon some months ago. A quantity has been used for the spirit lamp and other cleaning jobs. It is difficult to accurately estimate how much, if any, Mr. [REDACTED] took from this bottle. Our guess is 10-12 oz. There is no label on the bottle to indicate its contents, except for a faded hand ink-printed label "DO NOT DRINK". Since this investigation, a new label "POISON - ALCOHOL" has been added.

.../3

~~CONFIDENTIAL~~

~~RESTRICTED~~

*W.D.G. S/Compt
15/7/68*

12. At approximately 1545 hours, Thursday, 20 June 68, Mr. [redacted] reported to the nurse that he was nauseated and she gave him some effervescence. He did not appear to have been drinking, according to Nurse Morin, and she certainly would not have prescribed effervescence if she had had any suspicion that he had.

13. It certainly would not be difficult to obtain alcohol at this establishment if one desired, with the exception of Ethyl Alcohol. The ethyl alcohol is strictly controlled through our Propulsion Division Store and Propulsion Division. However, all other alcohol and alcoholic based solutions in the establishment are not potable. There is practically no control on these alcohols, and it can be found in many laboratories and offices. In fact, I found that we had received 2 gallons of Ethyl Alcohol for Poly X filon from Naz-Dar Canada Ltd, 925 Roselawn Ave., Toronto, which is simply labelled "Alcohol", and bears no poison warning label. Since Mr. Walling, Printing Shop Supervisor believes that a quantity of this alcohol is also missing, there is a doubt in my mind that Mr. [redacted] may also have taken some of this alcohol. *Amateur*

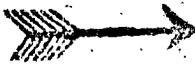
14. In talking with Dr. Bertrand 2 July 68, he advised that the eye specialist would be visiting Mr. [redacted] 3 Jul and they would know then whether there was any possibility of Mr. [redacted] regaining his sight.

15. I am of the opinion there is no negligence on the part of any employee, except possibly Mr. [redacted], that has caused this tragedy. Further information leads me to believe that others may be involved, and the investigation will continue. A further report will follow.

*II
Dir. Admin.
At your discretion
July 5/68 L.P.
WMB/mc*

(W.M. Butler)
Safety & Security Officer

P.A.



DRB 105-15/0

*Rfll
4 July 68*

Ottawa 4, Ontario,
July 4, 1968.

Executive Assistant to MND

Incident at GARDE, Valcartier, P.Q.

s.19(1)

1. Late yesterday afternoon Mr. Mylett, Director of Administration, reported that on June 21 a labourer (longtime casual employee) named [REDACTED] got hold of some kind of alcohol at GARDE, drank it and became ill and permanently blind. He is in hospital.
2. For days he refused to say where he got the alcohol so his doctor could identify the exact nature of the poison. Mr. Mylett called in the RCMP who interviewed [REDACTED] in hospital and persuaded him to admit that it was a type of cleaning alcohol he found in a photo laboratory.
3. It has been established that two other employees also sampled the potion. Both later became ill but apparently suffered no lasting effects.
4. Mr. Mylett's staff is investigating and a copy of their report will be forwarded to HQ.
5. So far no report has appeared in the Quebec newspapers but GARDE has had an inquiry from the office of a local Member of Parliament asking about the incident.
6. [REDACTED] is married with children.

ORIGINAL SIGNED BY
A. M. FORDYCE

(A. M Fordyce)
Comptroller

W. J. Fordyce

Ottawa 4, Ontario,
September 29, 1964.

Department of Labour,
Accident Prevention & Compensation Branch,
Transportation Building,
48 Rideau Street,
Ottawa, Ontario.

Attention: Mr. L. A. Aitken,
Safety Adviser

Dear Mr. Aitken;

Reference is made to your letter, File 13-9-4-33 dated
August 26, 1964.

In accordance with your request, we are returning one
copy of Form GE26, which has been completed on behalf of Mr.
Claude Cote, by our Canadian Armament Research and Development
Establishment at Valcartier.

Yours truly,

Original Signed by
C. A. WINSER

Att. 1
/ld

Chairman.

QUADRUPPLICATE
 FOR ORIGINATOR'S FILE



DEPARTMENT OF NATIONAL DEFENCE
REQUISITION FOR CHEQUE

DROLET A. (JAC/C2)

SERIAL No. _____

DATE
OF
CHEQUE

MAR - 5 1964

PAYEE'S
NAME
AND
ADDRESS

Andre Drolet

PLACE **OTTAWA CANADA**
 SOURCE **11**

PLEASE QUOTE CHEQUE NO. WHEN REFERRING TO THIS REMITTANCE.

PARTICULARS	AMOUNT	CHEQUE NO.
<p>Mr. Andre Drolet, 3105 Duval Street, QUEBEC, P.Q.</p> <p>In settlement of a claim for damage to clothing of Mr. Andre Drolet as the result of an accident on 1 Aug 63 at Valcartier Quebec, involving a lawnmower owned by DND.</p> <p><u>AUTHORITY:</u> DM 1r d 10 Feb 64</p> <p><u>CODED BY:</u> DRE/DGS</p> <p>Cheque to be sent to Mr. Drolet with letter at flyleaf.</p>	<p>\$15 00</p>	<p>489970</p>

F.E. NO.	DIV.	ESTAB.	VOTE	PRIM.	ALLOT.	OBJECT	AMOUNT
						MAR 5 1964	
						DEFENCE	

CERTIFIED:

(a) That this application is made under the requisite authority.
 (b) That each item of the above amounts has been incurred under requisite authority and that the expenditure was necessary for the Public Service.
 (c) That the articles and services charged for have been received and performed and that the prices charged are fair and just.

26 Feb 64
 DATE

[Signature]
 AUTHORIZED SIGNING OFFICER'S

VERIFIED FOR TREASURY

[Signature]
 APPROVED

[Signature]
 Treasury Officer

000355

TO: ~~ONEPA~~
~~XXXX BICORET~~
~~XXXX SARK~~
DRB/DGS

Please code and pass to CTO directly for cheque
issue and despatch.



JAG Claims

WITHOUT PREJUDICE

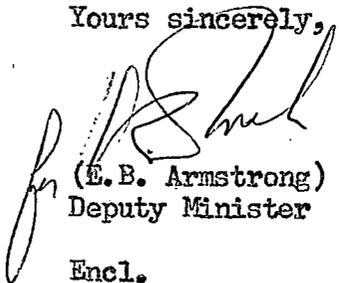
Mr. Andre Drolet,
3105 Duval Street,
Quebec, P.Q.

Dear Sir:

Claim against the Crown

I acknowledge receipt of executed releases dated 21 February,
1964, and attach a cheque for \$15.00 as payment in full of
your claim.

Yours sincerely,



(E. B. Armstrong)
Deputy Minister

Encl.

D.E. Inch/MS/24923

TRANSMITTAL SLIP

DATE
21-2-64

TO: DRB

FROM: Andre Drolet, 3105 Duval, Quebec

Note and File

Take Appropriate Action

Note and Return

As Requested

Please Speak

For Information

Please Answer

For Your Comments

For Your Approval

For Signature

Prepare Reply For My Signature

COMMENTS: reference your DROLET, A, (JAG/
C2)) d/10 Feb 1964. Enclosed release in
duplicate for \$15.00 signed for issuing
claim cheque.

Thank you!

CAFA 1327
HQ 4554--A1327

000358

R E L E A S E

KNOW ALL MEN by these presents that I, Andre Drolet
of the City of Quebec, in the
Province of Quebec

on behalf of myself and my heirs, executors, administrators, and assigns (hereinafter called "The Releasor"), do hereby remise, release and forever discharge HER MAJESTY THE QUEEN IN RIGHT OF CANADA, Her Officers, servants and members of Her Armed Forces, and in particular _____, Her and their heirs, executors, administrators, successors and assigns (hereinafter called "Her Majesty"), of and from all manner of actions, causes of action, claims or demands, of whatsoever kind or nature, which, against Her Majesty I, the Releasor, ever had, now have, or can, shall, or may hereafter have, for or by reason of, or in any way connected with an accident which occurred on August 1, 1963, at Valcartier, Quebec, involving a loan-awyer, Department of National Defence property, operated by Mr. Roland Daigle and resulting in damage to clothing of Mr. Andre Drolet.

It is understood and agreed that this Release shall only be effective when Her Majesty shall have paid to me, the Releasor, the sum of \$ 15.00

It is also understood and agreed that Her Majesty does not admit any liability to the Releasor by the acceptance of this Release or the payment of the said sum of \$15.00, and that such liability is denied.

IN WITNESS whereof I, the Releasor, have hereunto set my hand and seal this 21 day of FEBRUARY, A.D. 1964.

SIGNED, sealed and delivered)
in the presence of:

[Signature]
(Witness)

[Signature]
(Andre Drolet)

DROLET A. (JAG/C2)

Ottawa 4, Ontario,
10 February, 1964.

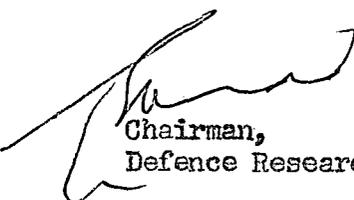
Mr. Andre Drolet,
3105 Duval Street,
Quebec, Quebec.

Dear Sir:

Claim against the Crown

I have been advised that a pair of your trousers may have been damaged by an accident which took place at Camp Valcartier, Quebec, on 1 August, 1963. Without admission of any liability but with a view to settling your claim, I am attaching a release in duplicate for \$15.00. When this release has been signed and returned, a cheque will be forwarded to you.

Yours sincerely,



Chairman,
Defence Research Board.

Encls.



D.R. Inch/GI/24923

R E L E A S E

KNOW ALL MEN by these presents that I, Andre Drolet
of the City of Quebec, in the
Province of Quebec

on behalf of myself and my heirs, executors, administrators, and assigns (hereinafter called "The Releasor"), do hereby remise, release and forever discharge HER MAJESTY THE QUEEN IN RIGHT OF CANADA, Her Officers, servants and members of Her Armed Forces, and in particular, Her and their heirs, executors, administrators, successors and assigns (hereinafter called "Her Majesty"), of and from all manner of actions, causes of action, claims or demands, of whatsoever kind or nature, which, against Her Majesty I, the Releasor, ever had, now have, or can, shall, or may hereafter have, for or by reason of, or in any way connected with an accident which occurred on August 1, 1963, at Valcartier, Quebec, involving a lawn-mower, Department of National Defence property, operated by Mr. Rolland Daigle and resulting in damage to clothing of Mr. Andre Drolet.

It is understood and agreed that this Release shall only be effective when Her Majesty shall have paid to me, the Releasor, the sum of \$ 15.00

It is also understood and agreed that Her Majesty does not admit any liability to the Releasor by the acceptance of this Release or the payment of the said sum of \$15.00, and that such liability is denied.

IN WITNESS whereof I, the Releasor, have hereunto set my hand and seal this day of, A.D. 1964.

SIGNED, sealed and delivered)
in the presence of:)

)
)
)
)
)

(Witness)

(Andre Drolet)

QUADRUPPLICATE
 FOR ORIGINATOR'S FILE

DEPARTMENT OF NATIONAL DEFENCE

REQUISITION FOR CHEQUE

DROLET A. (JAG/02)

SERIAL No. _____



CANADA

DATE OF CHEQUE

PAYEE'S NAME AND ADDRESS

Underwriters Adjustment Bureau Ltd.,
 P.O. Box 3000,
 Montreal 9, P.Q.

PLACE

OTTAWA CANADA

FEB - 4 1964

SOURCE

PLEASE QUOTE CHEQUE NO. WHEN REFERRING TO THIS REMITTANCE.

PARTICULARS	AMOUNT	CHEQUE NO.
For investigating and reporting an accident which occurred 1 Aug 63 at Valcartier, P.Q., involving a law-mower, DND property, operated by Mr. Rolland Daigle and resulting in damage to clothing of Mr. Andre Drolet. BUREAU LOSS NO. 116-8522-C <u>AUTHORITY:</u> Agreement between UAB and DND. <u>CODED BY:</u> D FIN M Cheque to be sent to UAB Montreal	\$40 75	464573

F.E. NO.	DIV.	ESTAB.	VOTE	PRIM.	ALLOT.	OBJECT	AMOUNT
30995			300	12	30	728	40 75

CERTIFIED:

(a) That this application is made under the requisite authority.
 (b) That each item of the above amounts has been incurred under requisite authority and that the expenditure was necessary for the Public Service.
 (c) That the articles and services charged for have been received and performed and that the prices charged are fair and just.

28 January 64
 DATE

[Signature]
 for Judge Advocate General
 AUTHORIZED SIGNING OFFICER (S)

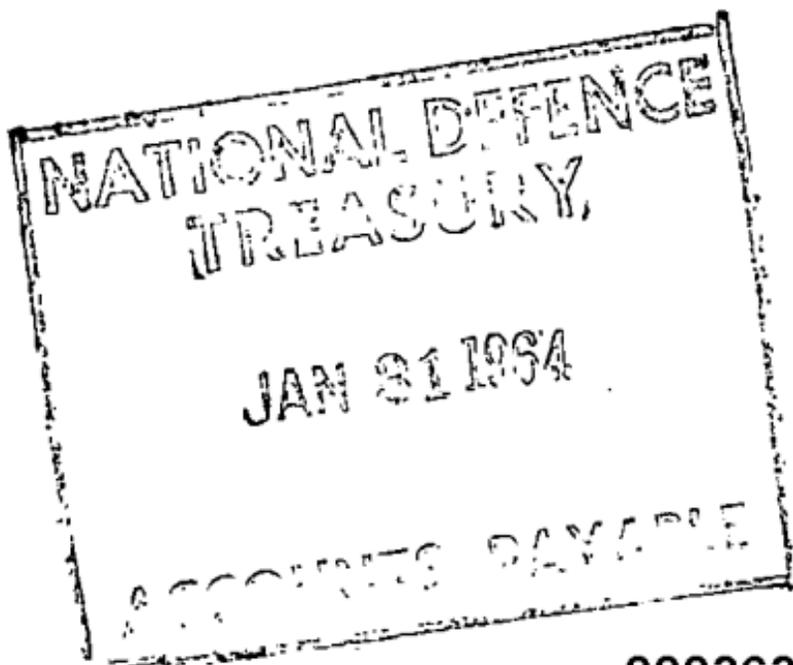
VERIFIED FOR TREASURY

ORIGINAL SIGNED BY
 J. P. HUDON

APPROVED

Original Signed by
 J. A. BARTER

Treasury Officer



000363

Underwriters Adjustment Bureau Ltd.

JUDGE ADVOCATE GENERAL Claims Section H.Q. National Defence Ottawa, Ont.					681092			
BUREAU LOSS NO. 116-8522-C			DATE Jan. 22-64					
CO. CODE 3-2675-00	YOUR POLICY NO.	YOUR CLAIM (OR) DATE OF LOSS Aug. 1-63	ASSURED DEPARTMENT OF NATIONAL DEFENCE					
ITEM	EXPENSES	OUTSIDE SERVICES	OFFICE EXPENSES	ADJUSTMENT FEE	TOTAL	TOTAL INSURANCE	YOUR PROP. INS.	YOUR PROP. A/C.
TOTALS	7.25	1.50	32.00	40.75	DND Driver: Mr. Daigle DND Vehicle: - Date: Aug. 1-63 Place: Valcartier, P.Q. Civilian: Andre Drolet			
PROOFS OF LOSS, TYPING AND/OR MIMEOGRAPHING, APPORTIONMENTS ETC.						TOTAL OF YOUR ACCOUNT \$ 40.75		

25.
ev

FORM 112 CON'T.

PLEASE RETURN "REMITTANCE COPY" WITH REMITTANCE TO P.O. BOX 3000, MONTREAL 9, P.Q.

000364

Underwriters Adjustment Bureau Ltd.

JUDGE ADVOCATE GENERAL Claims Section H. I. National Defence Ottawa, Ont.					70 <hr/> <hr/> <hr/>			
BUREAU LOSS NO. 116-3522-C			DATE Jan. 22-64					
CO. CODE 3-2675-00		YOUR POLICY NO.		YOUR CLAIM (OR) ASSURED DATE OF LOSS: Aug. 1-63 DEPARTMENT OF NATIONAL DEFENCE				
ITEM	EXPENSES	OUTSIDE SERVICES	OFFICE EXPENSES	ADJUSTMENT FEE	TOTAL	TOTAL INSURANCE DND Driver: Mr. Daigle DND Vehicle: - Date: Aug. 1-63 Place: Valcartier, P.Q. Civilian: Andre Brolet	YOUR PROP. INS.	YOUR PROP. A/C.
TOTALS	7.25		1.50	32.00	40.75			
PROOFS OF LOSS, TYPING AND/OR MIMEOGRAPHING, APPORTIONMENTS ETC.					TOTAL OF YOUR ACCOUNT. \$ 40.75			

FORM 112A CONT.

000365

Underwriters Adjustment Bureau Ltd.

THE GENERAL tion ional Defence a, Ont.	BUREAU LOSS NO. 116-8522-C
	DATE Jan. 22-64

CODE 2-2675-00	YOUR POLICY NO.	YOUR CLAIM (OR) DATE OF LOSS Aug. 1-63	ASSURED DEPARTMENT OF NATIONAL DEFENCE
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ITEM	EXPENSES	OUTSIDE SERVICES	OFFICE EXPENSES	ADJUSTMENT FEE	TOTAL	TOTAL INSURANCE	YOUR PROP. INS.	YOUR PROP. A/C.
						DND Driver: Mr. Daigle DND Vehicle: - Date: Aug. 1-63 Place: Valcartier, P.Q. Civilian: Andre Brolet		
TOTALS	7.25		1.50	32.00	40.75			

PROOFS OF LOSS, TYPING AND/OR MIMEOGRAPHING, APPORTIONMENTS ETC.	TOTAL OF YOUR ACCOUNT \$ 40.75
---	--

FORM 112A CONT.

000366

Underwriters Adjustment Bureau Ltd.

JUDGE ADVOCATE GENERAL
Civilian Section
H.C. National Defence
Ottawa, Ont.

_____ _____ _____	180
BUREAU LOSS NO. 110-8382-C	DATE Jan. 22-64

CO. CODE 3-2675-00	YOUR POLICY NO.	YOUR CLAIM (OR) (DATE OF LOSS) Aug. 1-63	ASSURED DEPARTMENT OF NATIONAL DEFENCE
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ITEM	EXPENSES	OUTSIDE SERVICES	OFFICE EXPENSES	ADJUSTMENT FEE	TOTAL	TOTAL INSURANCE	YOUR PROP. INS.	YOUR PROP. A/C.
						DND Driver: Mr. Galgie DND Vehicle: - Date: Aug. 1-63 Place: Valenrtior, P.Q. Civilian: Andre Drolet		
TOTALS	7.25		1.50	32.00	40.75			

PROOFS OF LOSS, TYPING AND/OR MIMEOGRAPHING, APPORTIONMENTS ETC.	TOTAL OF YOUR ACCOUNT \$ 40.75
---	--

FORM 112A CON'T.

000367

G. M. PELTON, GENERAL MANAGER.

V. O. WALSH, L.L.B. ASSISTANT GENERAL MANAGER

F. M. GRAY, C. A. BUSINESS INTERRUPTION MANAGER

Underwriters Adjustment Bureau Ltd.

QUEBEC DIVISION

I. C. GAVEY, MANAGER	
H. P. BOUDREAU, PROVINCIAL SUPERINTENDENT	
Referred to.....	<i>Jay</i>
JAN 24 1964	
File No. 105-15/0	
Chgd. to.....	

REPLY TO
P.O. BOX 3000
MONTREAL 9, QUE.
TEL. 735-3561
AND PLEASE QUOTE OUR LOSS NUMBER

January 21st 1964

CONFIDENTIAL

Judge Advocate General
Claims Section
H.Q. National Defence
OTTAWA, Ont.

Re: Accident Report
DND Driver : of lawn-mower: Mr. Daigle
DND Vehicle: -
Date : August 1st 1963
Place: Valcartier, P.Q.
Civilian Claimant: André Drolet
Our File : 116-8522-G

Dear Sir:

We attach final report of our correspondent relative to the subject accident and recommend disposal as indicated therein.

Invoice covering adjuster's fees and expenses is enclosed.

Yours very truly,

[Signature]
UNDERWRITERS ADJUSTMENT BUREAU LTD.

G. A. Legault, Supervisor
Casualty Department - Quebec Division.

G. M. PELTON, GENERAL MANAGER

V. O. WALSH, L.L.B. ASSISTANT GENERAL MANAGER

F. M. GRAY, C. A. BUSINESS INTERRUPTION MANAGER

Underwriters Adjustment Bureau Ltd.

QUEBEC DIVISION

J. C. GAVEY, MANAGER

H. P. BOUDREAU, PROVINCIAL SUPERINTENDENT

REPLY TO
P.O. BOX 216
STATION "B"
QUEBEC CITY
TEL. 525-8108

AND PLEASE QUOTE OUR LOSS NUMBER

Our File: 116-8522-C

January 17, 1964

Assistant Judge Advocate General,
Headquarters Quebec Command,
3530 Atwater Avenue,
Montreal, Que.

Gentlemen:-

Re: REPORT ON P.D. CLAIM

UNIT:

CARDE, Camp Valcartier, Que.

VEHICLE:

Gravelly Tractor lawn mower, serial # M-10718.

DRIVER:

Mr. Rolland Daigle, aged 51, married, residing at 64 du Domaine, Cap Rouge, and employed as a labourer by CARDE.

DATE & PLACE
OF ACCIDENT:

A pair of pants owned by Mr. André Drolet of 3105 Duval Street, Quebec. Apparently \$40.00 was paid for these pants, which were bought a year ago.

WITNESSES:

Robert Lessard, Jean Louis Anctil and Maurice Roy, all employed at # 58 Building in Valcartier Camp.

DRIVER'S VERSION:

Please find attached the version obtained from Mr. Rolland Daigle, who was driving the lawn mower, which was self-powered. As he was using this lawn mower, a piece of metal from the motor cover came out due to the vibration. This piece of metal was picked up by the rotating knives and was at the same time thrown away and struck Mr. André Drolet, who was passing by.

CONCLUSION:

Upon contacting the claimant, Mr. André Drolet, the latter claimed an amount of \$30.00 for his trousers, which were damaged beyond repair, being split at the knee. After discussing with this gentleman, we finally came to an agreement of \$15.00, which we believe is fair and reasonable.

This settlement was effected without prejudice.

.....2/

Underwriters Adjustment Bureau Ltd.

.....2/

116-8522-G

We are also attaching herewith a letter from the Chief Superintendent of CARDE, advising of the dates of maintenance on the involved machine. This letter is self-explanatory.

We also enclose literature concerning the Gravely Tractor, which has been furnished by the dealer of this machine in our area, namely Motoculture Moderne Enrg. We have discussed this accident with Mr. Gilet, owner of Motoculture Moderne, and the latter explained to us that from his experience, he could not see how this kind of machine could have thrown such a large piece of metal at a distance of about 20 feet. He explained to us that 4 rotary knives are encased in a round metal cover, that the knives are rotating one inch from the edge of this cover, which in turn travels on skates about $1\frac{1}{2}$ inches above the ground. Mr. Gilet stated that this type of machine is designed so that the grass will fall down as it is being cut by the blades and will not even fly outside this metal casing.

Mr. Gilet explained to us that in his 12 years of experience with this kind of machine, it happened only once that a small stone flew for a distance of about 5 feet, to strike a windowpane and it only broke same, the stone not even passing through the window. He cannot explain how a piece of metal 8" x 12" could have flown for a distance of about 20 feet, cutting the pants of anyone.

In view of the above circumstances, we fail to see any responsibility on the part of the Crown. We have therefore denied liability to the third party and are retiring our file, attaching herewith our account for services rendered.

Yours truly,

UNDERWRITERS ADJUSTMENT BUREAU LIMITED

Y. Matte p.w.

Yvan Matte
Adjuster - Quebec Branch

YM/gc
Enc.

8522

Je, soussigné Rolland Daigle, 51 ans marié demeurant
à 64 du Domaine, Cap Rouge, journalier pour C.A.R.D.E.,
déclare ce qui suit:

Le 1^{er} août 1963 vers 3.55 pm, je passais la tondeuse
à gazon devant la bâtisse #58, occupée par des bureaux.
Il s'agit d'une tondeuse de 20" avec couteau rotatif, "self powered"
et sur laquelle on passied. Cette tondeuse avance et recule.
Sans de l'accident, j'étais à reculer et dû à la vibration, un
garde du moteur a dû se détacher sans que je m'en rende
compte et quand le couteau rotatif passa dessus, il lança
le garde vers la droite pour aller frapper une personne
qui passait à environ 30 pieds de moi. Il s'agit d'une pièce
de "tôle" d'environ 8" x 12" et recourbi en L. Ce n'est pas nous
autres qui font la maintenance des tondeuses.

Québec, le 8 octobre 1963

Rolland Daigle

Grandmatte

Exposé de réclamation contre

Nom complet André Drolet Age 33 Marié ou célibataire Marié
Adresse 3105 Deval Ave Téléphone No 623-4075
Emploi Dessinateur Nom de l'employeur D. M. O.
Quand l'accident est-il arrivé? Date Sept 1 1963 Heure 3.58 Jour de la semaine -
Lieu de l'accident en face de la bâtisse 58
Marque de votre auto. _____ Genre _____ Année _____ Licence No. _____
Assuré par _____
Nom et adresse du conducteur _____ Age _____
Licence du conducteur No. _____ Emploi _____ Employé par _____
Noms et adresses de tous les passagers dans votre automobile _____

Y avait-il d'autres témoins de l'accident? Si oui, donnez noms et adresses de tous Robert Lessard, Jean Louis Enclil, Maurice Ray
No de Licence de l'autre auto. _____ Nom du conducteur L. Daigle
Comment l'accident est-il arrivé? Donnez un récit complet comprenant vitesse et direction de chaque automobile _____

Nature des dommages à votre auto pantalon Signature du chauffeur _____
Par qui réparés? _____ Coût des réparations \$ _____ Le compte a-t-il été payé? _____
Avez-vous été blessé? oui Nature et étendue des blessures coupure seulement
Noms et adresses des docteurs qui vous ont soigné _____

Y eut-il d'autres personnes dans votre automobile de blessées? _____ Si oui, veuillez donner leurs noms, adresses et âges, et dire la nature des blessures reçues et le nom du docteur donnant les soins dans le cas de chaque personne.
Je réclame le montant de \$15⁰⁰ pour mes pantalons, et je réclame par par la petite blessure sur mon genou gauche
Quel est le montant que vous réclamez? \$ _____ En quoi consiste le montant? _____
Daté à _____ ce _____ jour de _____ 19 _____

Signature du Témoin _____ Signature du Réclamateur André Drolet



DEFENCE RESEARCH BOARD
CANADIAN ARMAMENT RESEARCH & DEVELOPMENT ESTABLISHMENT

DEPARTMENT OF NATIONAL DEFENCE
CANADA

P O Box 1427
Quebec P.Q.
28th November 1963

Underwriter's Adjustment Bureau Ltd.,
P. O. Box 216,
Station "B",
Quebec, P.Q.

re: Department of National Defence
Date of Loss: Aug 1 1963
Third Party : Mr. André Drolet
Your file : 116-8522-C/161

Gentlemen:

Reference your letter dated 14th November 1963.

The machine involved in this accident was a Gravely
Tractor, Serial No. M-10718, purchased in 1956.

The repair and maintenance of this, and other similar
machines, is under contract DRB/V-1028, F.E. 3170, 701-17-05-660,
D.D.P. Serial Que-2-6556/1 dated 28 March 1963, with Mono-
culture Moderne Enrg., 380, 60e Rue Est, Charlesbourg, P.Q.
This particular machine was sent to them on the following dated:

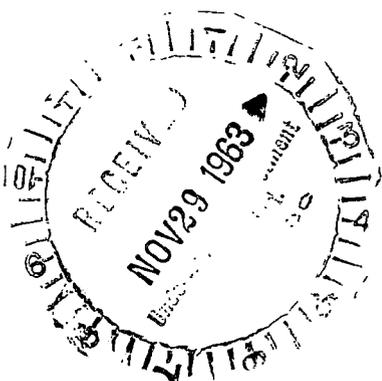
- 13 May 63 - To change from winter to summer operation.
- 25 July 63 - To change gasoline tank.
- 1 Oct 63 - To change from summer to winter operation.

On return from repair or maintenance the machine is checked by
personnel of our Receiving Section to ensure that that which has
been requested has been carried out. No further check is made
prior to the machine being put to use.

We trust this information is sufficient to enable you to
finalize this claim.

Yours truly,

for: Chief Superintendent,
C. A. R. D. E.



ROTARY MOWING - LEAF MULCHING



One Mowing Unit For Lawns and Weeds!

Now you cut the tough weeds, and the fine lawn, with one powerful Rotary Knife Mowing attachment!

The new Gravely Rotary Mower gives you a big cut—30 inches wide—to make short work of mowing jobs.

Think of the advantages of one mowing unit to do both your mowing jobs! You mow the lawn cleanly and evenly, and at the same time get rid of unsightly Buckhorn and Dandelion stems. This gives you a cleaner, lovelier lawn. And the grass is not windrowed on your lawn . . . instead, most of it is shredded into a mulch that quickly decays into organic matter. This organic matter enriches your lawn, makes it better nourished!

Then, with the same mower, you go right on mowing weeds,

without loss of time! And when you mow weeds with the Gravely Rotary Mower, the weeds will practically disappear. When properly operated, the mower will cut and shred the tallest weeds . . . and remember this big advantage! The Gravely Rotary Mower is SELF-PROPELLED! No pushing or pulling . . . you just guide the Gravely, the Tractor does the work. You even have a reverse.

And the Rotary Mower trims and cuts closer to obstacles than the conventional mowers. You get within an inch of buildings, fences, walks—this saves a lot of hand trimming!

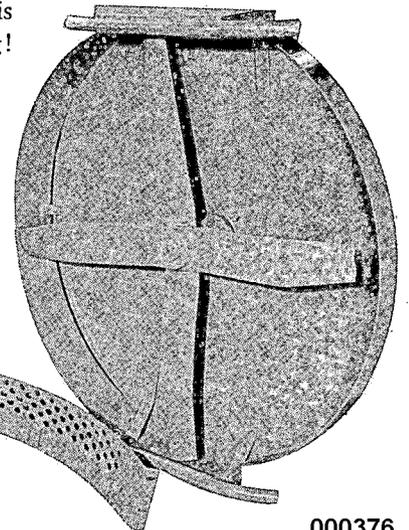
Design Simplicity Means Low Cost—Low Maintenance!

This picture shows you the rugged construction, the complete simplicity of design that means long lasting satisfaction. The two knives are heavy, have curved tips that lift the grass into the fast-whirling blades that are slanted to slice—not beat—the grass! This means greater cutting efficiency.

The few parts mean low maintenance. The knives are sharpened quickly and easily. There are no complicated adjustments . . . simply change the collars for the height you require. These collars are different sizes, and by using them in combination you obtain a cutting height of from 1½ to 2½ inches.

**ROTARY
MOWER**

**LEAF
MULCHER**



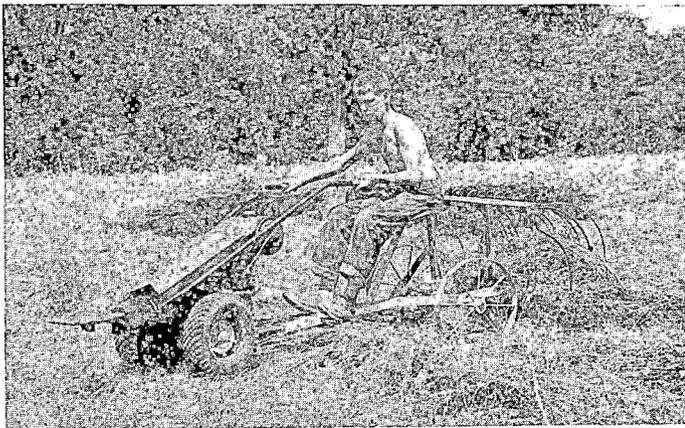
THE TOUGHEST MOWING JOBS

STEEP SLOPES MOWED EASILY

When your Tractor is equipped with either Dual Wheels or Extension Axles you mow slopes as steep as 60%. Either of these accessories lowers the center of gravity of the Tractor, and adds weight which gives more traction. You can mow almost anywhere a man can walk!

SAFETY CLUTCH PROTECTION

If you should happen to run onto an iron stake, or any other obstruction, the Gravely Safety Clutch will stall the mower without damage.



48" HAY RAKE

After the high weeds and grass are cut, attach the 48 inch Hay Rake and clean up. The Hay Rake is equipped with a comfortable riding seat. The Rake Lever and tractor controls are within easy reach.

SICKLE MOWER SPECIFICATIONS

SICKLE BAR: This consists of a conventional Sickle Bar with an oscillating mechanism. The drive Head is located on the cutter bar for balance; has swivel action, allowing the bar to conform to the contour of the ground independent of the tractor.

GEARS: All gears enclosed in dirt-proof housings with Timken Roller Bearings and running in oil.

CASTINGS: All vital parts of the oscillating mechanism are made from chrome alloy steel with certified, malleable castings.

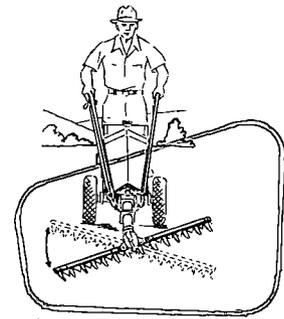
CUTTER BAR: The 42" Cutter Bar will cut from a 36" to a 39" swath and average from 3 to 4 acres a day in the roughest sort of cutting.

WEIGHT: 100 pounds. When packed, 150 pounds.

OVERALL DIMENSIONS: 42" x 42"

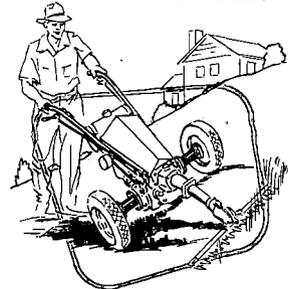
BLADE SWIVELS TO FOLLOW CONTOUR

The exclusive Gravely Patented Swivel Action of the Sickle Mower allows the Cutter Bar to follow the contour of the ground . . . regardless of the position of the tractor wheels.



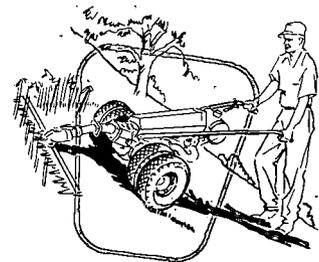
EXTENSION AXLES FOR STEEP SLOPES

The 35-inch Extension Axles will allow the Gravely to work on the banks with as much as a 60% angle. These Extension Axles are easily removed, quickly attached.



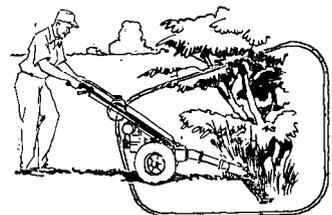
DUAL WHEELS ADD TRACTION

Dual Wheels allow you to mow on steep slopes, give you better traction anywhere. They lower the center of gravity, give you twice the traction, and add weight for a better grip on the ground. Especially helpful on rough ground.



EASY TO MOW UNDER TREES

The long "neck" of the Sickle Mower mounted on the front of the Tractor allows you to reach under trees, shrubs, bushes, hedges—the reverse allows you to back out quickly and effortlessly.

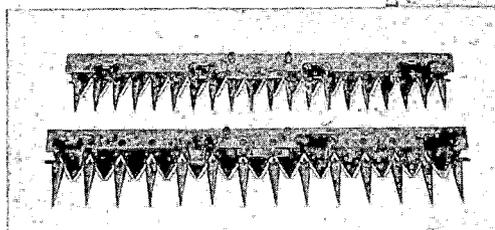
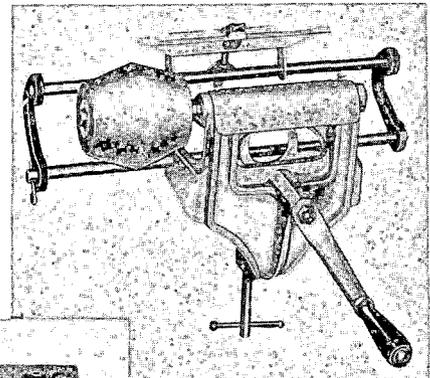


SICKLE GRINDER

Sharpens six sections of a Sickle Mower Knife before reclamping. It only takes a few minutes to sharpen the complete knife, and sharp knives mean quicker and better work.

SICKLE BARS

Shown below are the two sickle bars—top, the 2-inch Sickle Bar used for lawns and fine cutting. Bottom, the 3-inch Sickle Bar, used for high weeds, heavy cutting of all kinds. Same rugged construction, the only difference is in the size of guards and sections.



Underwriters Adjustment Bureau Ltd.

Our File: 116-8522-C

January 17, 1964

Assistant Judge Advocate General,
Headquarters Quebec Command,
3530 Atwater Avenue,
Montreal, Que.

Gentlemen:-

Re: REPORT ON P.D. CLAIM

UNIT:

CARDE, Camp Valcartier, Que.

VEHICLE:

Gravely tractor lawn mower, serial # M-10718.

DRIVER:

Mr. Rolland Daigle, aged 51, married, residing at 64 du Domaine, Cap Rouge, and employed as a labourer by CARDE.

DATE & PLACE OF ACCIDENT:

A pair of pants owned by Mr. André Drolet of 3105 Duval Street, Quebec. Apparently \$40.00 was paid for these pants, which were bought a year ago.

WITNESSES:

Robert Lessard, Jean Louis Anctil and Maurice Roy, all employed at # 58 Building in Valcartier Camp.

DRIVER'S VERSION:

Please find attached the version obtained from Mr. Rolland Daigle, who was driving the lawn mower, which was self-powered. As he was using this lawn mower, a piece of metal from the motor cover came out due to the vibration. This piece of metal was picked up by the rotating knives and was at the same time thrown away and struck Mr. André Drolet, who was passing by.

CONCLUSION:

Upon contacting the claimant, Mr. André Drolet, the latter claimed an amount of \$30.00 for his trousers, which were damaged beyond repair, being split at the knee. After discussing with this gentleman, we finally came to an agreement of \$15.00, which we believe is fair and reasonable.

This settlement was effected without prejudice.

.....2/

Underwriters Adjustment Bureau Ltd.

.....2/

116-8522-C

We are also attaching herewith a letter from the Chief Superintendent of CARDE, advising of the dates of maintenance on the involved machine. This letter is self-explanatory.

We also enclose literature concerning the Gravely Tractor, which has been furnished by the dealer of this machine in our area, namely Motoculture Moderne Emrg. We have discussed this accident with Mr. Gilet, owner of Motoculture Moderne, and the latter explained to us that from his experience, he could not see how this kind of machine could have thrown such a large piece of metal at a distance of about 20 feet. He explained to us that 4 rotary knives are encased in a round metal cover, that the knives are rotating one inch from the edge of this cover, which in turn travels on skates about 1½ inches above the ground. Mr. Gilet stated that this type of machine is designed so that the grass will fall down as it is being cut by the blades and will not even fly outside this metal casing.

Mr. Gilet explained to us that in his 12 years of experience with this kind of machine, it happened only once that a small stone flew for a distance of about 5 feet, to strike a windowpane and it only broke same, the stone not even passing through the window. He cannot explain how a piece of metal 8" x 12" could have flown for a distance of about 20 feet, cutting the pants of anyone.

In view of the above circumstances, we fail to see any responsibility on the part of the Crown. We have therefore denied liability to the third party and are retiring our file, attaching herewith our account for services rendered.

Yours truly,

UNDERWRITERS ADJUSTMENT BUREAU LIMITED

Yvan Matte
Adjuster - Quebec Branch

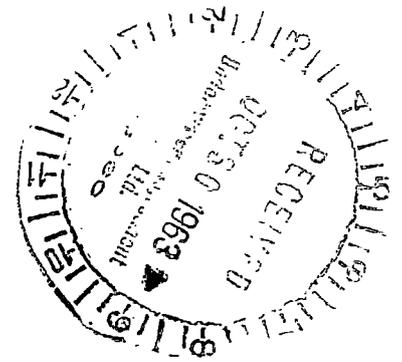
YM/gc
Enc.

Je, soussigné Rolland Daigle, 51 ans marié demeurant
à [redacted] du Domaine, Cap Rouge, journalier pour C.A.R.D.E.,
déclare ce qui suit:

Le 1^{er} août 1963 vers 3.55 pm, je passais la tondeuse
à gazon devant la bâtisse #58, occupée par des bureaux.
Il s'agit d'une tondeuse de 20" avec couteau rotatif, "self powered"
et sur laquelle on passe à l'avance et recule.
Sans de l'accident, j'étais à reculer et dû à la vibration, un
garde du moteur a dû se détacher sans que je m'en rende
compte et quand le couteau rotatif passa dessus, il lança
le garde vers la droite pour aller frapper une personne
qui passait à environ 30 pieds de moi. Il s'agit d'une pièce
de "tôle" d'environ 8" x 12" et recourbée en L. Ce n'est pas nous
autres qui font la maintenance des tondeuses.

Québec, le 8 octobre 1963
Grandmatté

Rolland Daigle





DEFENCE RESEARCH BOARD
CANADIAN ARMAMENT RESEARCH & DEVELOPMENT ESTABLISHMENT

DEPARTMENT OF NATIONAL DEFENCE
CANADA

P O Box 1427
Quebec P.Q.
28th November 1963

Underwriter's Adjustment Bureau Ltd.,
P. O. Box 216,
Station "B",
Quebec, P.Q.

re: Department of National Defence
Date of Loss: Aug 1 1963
Third Party : Mr. André Drolet
Your file : 116-8522-C/161

Gentlemen:

Reference your letter dated 14th November 1963.

The machine involved in this accident was a Gravely
Tractor, Serial No. M-10718, purchased in 1956.

The repair and maintenance of this, and other similar
machines, is under contract DEB/V-1028, P.R. 3170, 702-17-05-660,
D.D.P. Serial Que-2-6556/1 dated 28 March 1963, with Mono-
culture Moderne Enrg., 380, 60e Rue Est, Charlesbourg, P.Q.
This particular machine was sent to them on the following dates:

- 13 May 63 - To change from winter to summer operation.
- 25 July 63 - To change gasoline tank.
- 1 Oct 63 - To change from summer to winter operation.

On return from repair or maintenance the machine is checked by
personnel of our Receiving Section to ensure that that which has
been requested has been carried out. No further check is made
prior to the machine being put to use.

We trust this information is sufficient to enable you to
finalize this claim.

Yours truly,

Florence Kenny

for: Chief Superintendent,
C. A. R. D. E.

Copy of this report sent to Supervisor, C.A.R.D.E., Valcartier, P.Q.

G. M. PELTON, GENERAL MANAGER

V. WALSH, L.L.B. ASSISTANT GENERAL MANAGER

F. M. GRAY, C. A. BUSINESS INTERRUPTION MANAGER

RG

Underwriters Adjustment Bureau Ltd

Referred to..... *JAG*

QUEBEC DIVISION

J. C. GAVEY, MANAGER

H. P. BOUDREAU, PROVINCIAL SUPERINTENDENT

116-8522-15/0

Oct 15 1963

Replied to.....

REPLY TO
P.O. BOX 3000
MONTREAL 9, QUE.
TEL. 735-3561
AND PLEASE QUOTE OUR LOSS NUMBER

CONFIDENTIAL

Judge Advocate General
Claims Section
H.Q. National Defence
OTTAWA, Ont.

October 9th, 1963



RE: Accident Report
 DND Driver : of lawn-mower: Mr. Daigle
 DND Vehicle: -
 Date : August 1st 1963
 Place : Valcartier, P.Q.
 Civilian Claimant: André Drolet
 Our File : 116-8522-G

Dear Sir:

We attach report of our correspondent relative to the subject accident for your information.

We are following this matter and will keep you advised.

Yours very truly,

UNDERWRITERS ADJUSTMENT BUREAU LTD.

A Legault
A Legault - Supervisor
Casualty Department - Quebec Division.

M. J. [Signature]

G. M. PELTON, DIRECTEUR GÉNÉRAL

V. ALSH, LL. B., DIRECTEUR GÉNÉRAL ADJOINT

F. M. GRAY, C. A., AJUSTEUR ADMINISTRATIF

Underwriters Adjustment Bureau Ltd.

DIVISION DU QUÉBEC

J. C. GAVEY, DIRECTEUR

H. P. BOUDREAU, SURINTENDANT PROVINCIAL

VEUILLEZ ADRESSER
VOTRE REPONSE A
126, RUE ST-PIERRE
QUEBEC, QUE.
TEL. (418) 525-8108

ET INDIQUER LE NUMERO
DE NOTRE DOSSIER

Your file: CARDE 595-3
Our file: 116-8522-G

October 7th, 1963

Assistant Judge Advocate General,
Headquarters Quebec Command,
3530 Atwater Avenue,
Montreal, Que.

Gentlemen:

Re: DEPARTMENT OF NATIONAL DEFENCE
C.A.R.D.E. VALCARTIER
Claimant: André Drolet
Accident: August 1st, 1963

On September 9th, 1963, we were requested by Mr. W. Butler to investigate the circumstances of an accident which occurred on the above mentioned date on North Site Area, Valcartier.

A piece of metal coming from a lawnmower driven by Mr. Daigle, struck the claimant on the left knee cap. The Third Party is Mr. Andre Drolet, 3105, Duval, Québec. We suggest a P.D. reserve in the amount of \$40.00.

We are investigating and a detailed report will follow in due course.

Yours very truly,

UNDERWRITERS ADJUSTMENT BUREAU LTD.



D. Bertrand
Adjuster-Quebec Branch

DB/mv

Underwriters Adjustment Bureau Ltd.

Your file: CARDE 595-3
Our file: 116-8522-0

October 7th, 1963

Assistant Judge Advocate General,
Headquarters Quebec Command,
3530 Atwater Avenue,
Montreal, Que.

Gentlemen:

Re: DEPARTMENT OF NATIONAL DEFENCE
C.A.R.D.E. VALCARTIER
Claimant: André Drolet
Accident: August 1st, 1963

On September 9th, 1963, we were requested by Mr. W. Butler to investigate the circumstances of an accident which occurred on the above mentioned date on North Site Area, Valcartier.

A piece of metal coming from a lawnmower driven by Mr. Daigle, struck the claimant on the left knee cap. The Third Party is Mr. Andre Drolet, 3195, Duval, Québec. We suggest a P.D. reserve in the amount of \$40.00.

We are investigating and a detailed report will follow in due course.

Yours very truly,

UNDERWRITERS ADJUSTMENT BUREAU LTD.



D. Bertrand
Adjuster-Quebec Branch

DB/mv

~~DNIC - GAGNE, Jean Paul~~

Ottawa, Ontario,
May 2, 1962.

Chief Superintendent,
C.A.R.D.B.

Report on Major Accident to
GAGNE, Jean Paul

1. Attached is Form G.E. 26, in duplicate, regarding the accident sustained by Mr. Jean Paul Gagne, on February 1, 1962.
2. It would be appreciated if you would complete these forms and return both copies as soon as possible.
3. This information has been requested by the Government Employees Compensation Branch, of the Department of Labour.

Original Signed by
C. A. WINNER

Chairman.

PA
Att. 2
AFR:ld

→ c.c. - File 105-15/0

RECLASSIFICATION NOTICE

To: _____

File: SRB105-15/0.

1. OUTGOING - Letter Copy Memo Copy

2. INCOMING - Letter Memo

Addressed to _____

Originator _____

Date _____

Date _____ Ref. No. _____

3. GENERAL CORRESPONDENCE Dated from _____ to _____

Synopsis: Re Claim by Royal Construction Ltd -
Seward & Co. Inc re accident -
Slings Failure - Trailer Truck on 4 Apr 62.

4. Has been reclassified to file SRB 431-1 T 5 2226.

5. May your records be amended accordingly for any future action.

Date 14 Aug 62

(per) C Lafabey
Directorate of Central Registries.

Mail Record Amended

(Initials)

MESSAGE FORM

FOR COMMEN/SIGNALS USE

NUMBER

P.A. →

PRECEDENCE - ACTION ROUTINE	PRECEDENCE - INFO DEFERRED	DATE - TIME GROUP 7 1920 Dec 61	MESSAGE INSTRUCTIONS
FROM: DEFENCE RESEARCH BOARD OTTAWA ONTARIO			PREFIX GR
TO: CS/CARDE VALCARTIER QUEBEC			SECURITY CLASSIFICATION CONFIDENTIAL
INFO: (1)			ORIGINATOR'S NUMBER DRB 1876

BECAUSE OF DAMAGE TO THEIR EQUIPMENT BY RECENT ACCIDENT INVOLVING
XX 105MM SHELL, INSPECTION SERVICES MUST BE KEPT INFORMED OF CARDE
 INVESTIGATION (.) COPY OF FINDINGS SHOULD BE SENT TO IS (.)

c.c. Mr. L.C.W.S. Barnes,
 Inspection Services.

(2) sd
 Please follow up until
 action completed
was done
 11/61

PAGE OF PAGES		REFERS TO MESSAGE		DRAFTER'S NAME		OFFICE		TEL.			
		CLASSIFIED YES <input type="checkbox"/> NO <input type="checkbox"/>		R. A. BERRY		DRB/DWR		2-0689			
FOR OPR'S USE	R	DATE	TIME	SYSTEM	OPERATOR	D	DATE	TIME	SYSTEM	OPERATOR	RELEASED BY OFFICER'S SIGNATURE
											R. A. BERRY

DEPARTMENT OF NATIONAL DEFENCE

MINUTE SHEET

B. O. Baker
DWR

DEC 6 1961

Referred to

REMARKS

To be signed in full showing Appointment, Telephone Number & Date

R.A.B.

Telecom this date - Les Baines I.S.

I take it he feels a bit
miffed that Cardo ruined some
of his equipment with the 105 mm.
He is not too worried at present,
~~but~~ and feels he can close his books
if Cardo are holding on investigation
& he is kept informed & gets a copy.

Suggest you wire Cardo, copy to I.S.
status because of the involvement
of I.S. equipment, I.S. must be kept
informed & a copy of the enquiry ^{findings} sent to I.S.

RESTRICTED

CADEE: 1010-1
CARDE/1019-10

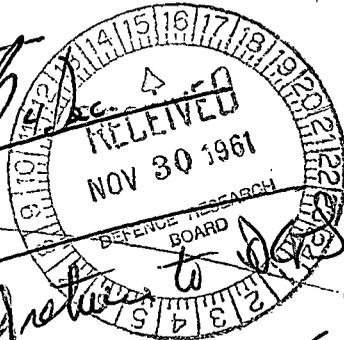
DEPARTMENT OF NATIONAL DEFENCE

- ARMY - H.M. B.
C of B

DEC 4 1961

C.A.D.E.E.,
P.O. Box 1427,
QUEBEC, P. Q.

28 Nov 61.



②
Comptroller
through @ DWR

Noted to Comdt
6 Dec 61

To write, plan, and return to DWR
to pass to JAG.
w/attached
[Signature]

noted
HMB

Army Headquarters,
Department of National Defence,
OTTAWA 4, Ontario.

NOV 30 1961
DRB 905-15/0

Attention: DQMG (EE)

Ammunition Accident Report

1. Attached are four copies of an Ammunition Accident Report in accordance with RCOC Instructions Part 10, Instruction 804. This amplifies our message CARDE 2275 of 22 Nov 61.
2. The accident occurred during an R and A Firing Trial in connection with Project PGC B105-10-19-10, Increased Range 105-mm Howitzer.
3. An Army Board of Inquiry has been convened by CADEE: *
4. A CARDE Board of Inquiry is also being initiated.

1/12
61

cc: DRB (DWR).
EQA.
DEE.
AEEE.

* I understand that the Army will not be having a Board of Inquiry, but will be satisfied with a DRB Report.
SL 4/12/61.

Encl: 4

[Signature]
(H.J. LAKE) Colonel,
Superintendent C.A.D.E.E.

RESTRICTED

RESTRICTED

Annex "A"
to CADEE: 1010-1
CARDE/1019-10
Dated: 28 Nov 61.

AMMUNITION ACCIDENT REPORT

IN ACCORDANCE WITH

RCOC INSTRUCTIONS PART 10 INSTRUCTION 804

NOTE: As the ammunition concerned in this accident is in the development stage, certain sections of the standard report do not apply.

1. Unit, place and time of accident

CADEE. Accident occurred at ISP & EE, Nicolet at 1218 hrs 22 Nov 61.

2. Equipment

a. Nomenclature - 1-N502675, Howitzer, 105-mm M2A2E2.
Carriage, Cdn 51.
Barrel ZF128.
Recoil mechanism M2A3, Cdn 45.
Muzzle brake, type S201A, CSF No. 58.

b. Last Inspection

(1) Date - 12 Oct 61.

(2) No. of rds fired since last inspection - EFC's = 8
Experimental rds = 11

NOTE: Barrel in 1st quarter.

TOTAL: 19

c. QE and position of equipment

(1) QE - 65°.

(2) Spades dug in against buried timber deadheads, and sandbagged.

(3) Obstructions in vicinity of gun - Nil. A frame stepladder was lying flat on the ground to the immediate right front of the gun.

(4) Obstructions in bore - Nil. No rain.

d. Nature of Accident - Bore premature.

RESTRICTED

RESTRICTED

2.

e. Damage

- (1) Tube severed in two about six inches from C of R. Approximately fifteen inches of tube missing.
- (2) Severe damage to recoil mechanism, cradle, elevating arcs, muzzle brake, shields, sighting system, breech assembly and tires. i.e. probable salvageable material is axle assembly, lower carriage, trail legs, wheels.

3. Ammunition

- a. Nomenclature - Cartridge, 105-mm, HE (Comp B) XC6E4 with fuze PDM51A5.
- b. Projectile - N/A - experimental.
- c. Fuze - Fuze PDM51A5 0.05 sec delay (w/booster M21A4) Lot JA-502-182.
- d. Supplementary Charge - Comp A Lot CAD191.
- e. Tracer - N/A.
- f. QF Cartridge - Cartridge case M14B1.
Primer M28B2 Lot KN-6-240.
Propellant Charge - experimental.
- g. Reason to suspect ammunition before firing - Nil.
- h. Any difficulty in ramming etc. - No.
- j. Nature of detonation
 - (1) Complete detonation.
 - (2) Reasons - large flash observed at 800 yds.
- approximately fifteen inch section of tube demolished.
- k. The projectile was in the gun one minute awaiting firing. The gun was hot.
- m. Rate of fire - Rate of fire was one round every three minutes and had continued for six rounds.
- n. Rounds fired immediately prior to accident were normal in all respects.

4. Weather

Copy of the weather report is at Appendix 1.

5. Casualties

Nil.

RESTRICTED

C O P Y

Appendix 1
to Annex "A"
to CADEE: 1010-1
CARDE/1019-10
Dated: 28 Nov 61.

INSPECTION SERVICES PROOF ESTABLISHMENT

23 November 1961

SURFACE WEATHER OBSERVATIONS

Weather conditions at 1100 and 1300 EST on Nov 22, 1961, were the following:-

SKY : Overcast with Stratocumulus clouds at an estimated
: height of 3,500 feet.

VISIBILITY : Good, estimated 12 miles.

WIND : East 6 to 8 m.p.h.

TEMPERATURE : at 1100 - 39.1°F.
: at 1300 - 37.1°F.

RELATIVE HUMIDITY : at 1100 - 83%
: at 1300 - 87%

BAROMETER : at 1100 - 30.19 inches.
: at 1300 - 30.18 inches.

AIR DENSITY : at 1100 - 106.7%
: at 1300 - 107.1%

Signed: G. Racine
Met. Officer.

CERTIFIED TRUE COPY


(D.H. KELLY) Major.

C O P Y

DRB 105-15/0

Ottawa, Ontario,
September 6, 1961.

Chief Superintendent,
CARDE.

Accident on "R" Range, June 22, 1961
CARDE file 105-1 TD 2

1. Receipt is acknowledged of your letter of September 1, 1961.
2. It is gratifying to note the prompt and effective action taken by the CARDE Special Hazards Committee to prevent recurrence of a similar accident.

Original Signed by
A. M. FORDYCE

Chairman

MDH:ec



DEPARTMENT OF NATIONAL DEFENCE
CANADA

DEFENCE RESEARCH BOARD
CANADIAN ARMAMENT RESEARCH AND DEVELOPMENT
ESTABLISHMENT



P.O. Box 1427,
Québec, P.Q.
1 Sep 61.

DGS
SEP 5 1961
DRB 105-15/0

The Chairman
Defence Research Board
Ottawa, Ontario.

Accident on "R" Range, 22 Jun 61

1. Reference is made to your DRB 105-15/0 (DGS) dated 4 Aug 61.
2. It is agreed that this accident was similar, in some respects to the accident in Jul 59. However, a major dissimilarity is that this fire occurred in a portion of the system remote from the manned control position, whereas the earlier explosion was in one of the valves at the manned control location.
3. The fact that the area where the recent accident occurred was not shielded is related to this dissimilarity, in that the mandatory requirements for shielding were originally imposed to protect personnel at the manned control location and, consequently, requirements for shielding installations at other locations were not specifically stated. Apparently this led to interpretation of the regulations as referring to the manned control station only. This discrepancy in the regulations is now being corrected.
4. When the "R" Range system was installed the manned control station was well protected but, since personnel are not present in the gun bay during loading and firing, it was not considered necessary to shield the valve panel remotely located there. Exposure of personnel during leak testing was accepted because the pressures involved were low. The panel where the accident occurred is now shielded and this practice will be followed in future similar installations.
5. The Special Hazards Committee discussed the report on this accident on 2 Aug 61. The Committee concurred in the recommendations in para (c) and para (d) 3 of the report and referred the recommendations in para (d) 1 and 2 to the CARDE Safety Committee.

In connection with the recommendations in para (c) 1, 2 and 3, the Committee accepted reports to the effect that:

- a. Immediately after receiving the investigation report the following action was taken:
 - (1) Instructions were issued and implemented to provide for leak testing with nitrogen or helium only. For reasons of economy helium is to be used only when nitrogen is not available.
 - (2) Instructions regarding locations of personnel have been re-stated, to ensure that no persons are in the gun bay or other dangerous locations while gas of any kind is flowing. Entering the gun bay for examination of the system for leaks may take place only after the leak testing gas supply has been shut off and the charge has been left quiescent for five minutes or longer.

(2) C of A (through C of A)
To notes please.
Asks noted para 3
recommended for a grant
W. J. ...
6/9/61
These safety regulations are all in H in Handbook however. The real cause of both these accidents appears to have been - presence of either water or steam - this is in the system - this is a matter that should be carefully checked on.
note added Prof. ... 6.9.61
H. B.

SEP 7 1961

- 2 -

CARDE/105-1 TD2
d/1 Sep 61.

6. b. There is no necessity for observation of the gun and installations in the gun bay during loading. Any malfunctioning which may occur will be reflected on one or more of the gauges located in the manned control centre.
- c. The range engineers have been directed to ensure that the procedures stated in para (c) 3 of the report are observed in all calibrations of transducers and gauges.
7. The recommendation in para (c) 4 of the report is being implemented by Mechanics Wing. Mechanics Wing has also been requested to investigate appropriate action in connection with the recommendation in para (d) 3 of the report.
8. The recommendations in paras (d) 1 and 2 of the report were discussed at the meeting of the CARDE Safety Committee on 30 Aug 61, where it was agreed that:
- a. Our present agreement with Camp Valcartier permits persons injured on the ranges to be taken to the Camp hospital for emergency treatment, rather than to the CARDE nurse, and this should be done, when appropriate. However, it must be emphasized that seriously injured persons may be moved only under direction of a doctor.
- b. Except for stretchers, which are already carried in the ambulance, it is preferable that the items listed in para (d) 2 be held at each of the permanent range installations, so that they will be available before the ambulance arrives. In this connection it was noted that first aid kits, crowbars and jacks are already held at the range locations.
9. The instructions issued after this accident, and related requirements, will be confirmed in revised Special Hazards Regulations and Standing Orders, which will be issued shortly.

R.F. Wilkinson

(R F Wilkinson)
Deputy Chief Superintendent.

DRB 105-15/0 (DGS)

PA

Ottawa, Ontario,
August 4, 1961.

Chief Supt.,
C.A.R.D.E.

Accident "R" Range (22-6-61)

1. We acknowledge your CARDE 105-1 dated July 17th, 1961 forwarding the Report of a Board of Enquiry on the accident at "R" Range.
2. It is noted, that the cause of this accident was similar to that which occurred during the firing of a 2" gas gun on Range 2 the 29th July, 1959.
3. At that time, the Board of Enquiry found in para 1.2 of the regulations approved by the Chief Superintendent in C.S. 105 dated 7th October, 1958 (CARDE file 9900-3) the following; "Adequate protection is to be provided for personnel and instrumentation against failure of pressure vessels and associated equipment" and stated; "This regulation was not observed adequately in the following respects:

"The high pressure system was not covered by a protective steel etc."

4. The Board of Enquiry into the recent accident has also recommended; "Personnel leak-checking gas guns should be suitably clothed and protected by appropriate metal guards around potential danger spots. In any event no personnel should be in the danger area while gas is flowing. Suitable viewing shelters should be investigated."

5. Your Special Hazards Regulations covering the Trials Section, Technical Services Wing, No. 3-1 at paras 2 and 6 make it mandatory that the protection previously mentioned shall be provided in installations for charging and firing light gas guns.

6. These regulations show the date of issue as 10 April, 1961, yet the Board of Enquiry into the accident that occurred on June 22nd, 1961 and injured Mr. Jean Beaulieu recommends such protective measures.

7. Will you please advise the results of the July meeting of the CARDE Special Hazards Committee at which the recommendations of the Board of Enquiry were to be discussed.

Original Signed by
A. M. FORDYCE

For Chairman.

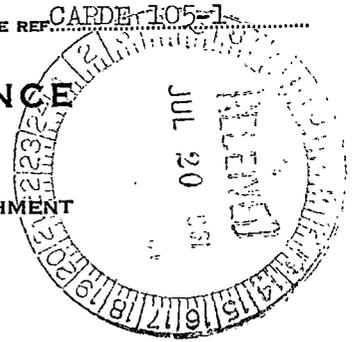
CAS:jf

OUR FILE REF. CARDE 105-1



DEPARTMENT OF NATIONAL DEFENCE DEFENCE RESEARCH BOARD

CANADIAN ARMAMENT RESEARCH AND DEVELOPMENT ESTABLISHMENT
P.O. BOX 1427, QUEBEC, P.Q.



17th July 1961

Referred to *ref*
JUL 20 1961
File *ARB 105-15/0*
Chief to.....

Chairman,
Defence Research Board,
Department of National Defence,
Ottawa, Ont.

Accident - "R" Range, 22 June 61

1. Please find attached, in duplicate, the report of a Board of Inquiry appointed by Deputy Chief Superintendent to investigate an accident which occurred on "R" Range, 22 June 61.
2. The recommendations will be discussed by the CARDE Special Hazards Committee at their July meeting.
3. Kindly note that Mr. Jean Beaulieu is a contractor attached (CDC) employee.

J. Beaulieu
for: Chief Superintendent
C. A. R. D. E.

(4) Agree with (3).
These hazards exist & safety rules are adjusted to cater for them. Undoubtedly operating staff will have to insist on strict enforcement of cause as familiarity is greatest over-sight.
H.M. CofE
O.D.W.

JUL 21 1961

000400

JUL 27 1961

⑤ Progs Comm
Prepare suitable letter to
CS/CARD E for HCF/A
respective please
27/6/61

② DWR (through C of E)
To note, please. Your comments
would be welcomed
20/6/61

③ If I recall - this is the second
accident involving oxygen cones
in contact with oil that has
occurred - oil & high pressure
oxy gun as a well recognized hazard
and the greatest care should be
exercised to see that substances
do not come in contact
from B

REPORT OF THE BOARD OF ENQUIRY

ON THE ACCIDENT ON "R" RANGE

ON JUNE 22, 1961

INTRODUCTION

On Thursday afternoon June 22, 1961, an accident occurred on "R" Range with the 7 in. Light Gas Gun and as a result the Deputy Chief Superintendent convened a Board of Enquiry on June 23 to investigate the accident. The Board consisted of Mr. C.D. Martin (Chairman) Dr. H.M. McMahon, Lt. E.W. Rance and Mr. J.S. Watson with terms of reference as outlined in Memo included as Appendix "A".

Two members of the Board viewed the scene of the accident shortly after it had occurred, the Chairman, because of absence, and Lt. Rance did not investigate the scene until the following Tuesday June 27 at which time some clean-up had been carried out.

The Board met on June 28 and discussed a report on the accident (See Appendix "B") by Mr. P. Solnoky, Field Engineering Group Leader, Trials Section. Also at the meeting an interrogation of Mr. R. Warnika, "R" Range Engineer and Lt. W.C. Higgins, "R" Range Trials Officer, took place. The statement of the Trials Officer regarding the accident is included as Appendix "C". The Board met again on June 30 and July 4 to complete its findings and prepare the report to be forwarded to the Deputy Chief Superintendent.

As a result of the accident Mr. Jean Beaulieu, Gun Captain at the trial received moderate burns to one leg from hot metal particles and minor damage was sustained to equipment by loss of some high pressure piping and fittings. The medical report on the injury is enclosed as Appendix "D".

(a) Determination of the Cause of the Accident

The situation prior to the accident was briefly as follows: The 7 in. Light Gas Gun at "R" Range was being prepared for a firing in which a mixture of oxygen gas and hydrogen gas was to be used. For some days previous to the day of the accident "leak tests" had been carried out on the gun and associated valve panel connections. Most of the leaks had been eliminated and a sixth test was being carried out to confirm the last repair on the piezo gauge line inside the gun chamber prior to proceeding with the final gas loading and firing. Oxygen gas is charged first in the gun and has certain advantages over an inert gas in carrying out the final leak-test prior to the introduction of the desired mixture of oxygen and hydrogen for the firing. Shortly after the start of applying oxygen pressure to the line leading to the gauge panel and gun a burn-through of the fittings and line near a filter section at the first valve (See photographs of panel) occurred which caused minor damage to the equipment before the supply was shut off and caused burns on the hands and leg of the Gun Captain, Mr. Jean Beaulieu who was walking by at the time after checking the vacuum pump at the muzzle end of the gun. A small fire was started on a work bench approximately 25 ft back from the breech of the gun from hot particles landing in a piece of foam rubber. The Artificer, the Technical Assistant to the Field Engineer and an Instrumentation Section representative were standing near the bench but none was injured.

- 2 -

The cause of the burn-through is fully discussed in the included report of Mr. Solnoky. The Board concurs with his findings with respect to the technical cause since they provide a reasonable mechanism for some combustible contaminant matter getting into the line and not reacting on leak-test number 5 while causing the burn-through on test number 6. In addition to Mr. Solnoky's findings, the Board believes that in order to account for the initiation of the reaction from, apparently, a small amount of contaminant it is necessary to look more closely at the filter. The porous sintered metal construction of the filter appears to provide the necessary high surface to mass ratio needed to account for sufficient temperature to get the reaction into a metal oxidizing stage. A factor which also appears to have had some effect in initiating the reaction is the flowing gas. It was observed that in a somewhat similar incident reported on by a Board of Enquiry July 29, 1959, the reaction occurred shortly after the onset of oxygen flow. Heating due to compression or friction during flow may have had a contributing effect.

(b) Determine if all the Required Safety Procedures for the Facility were being observed

The equipment and lines were cleaned in accordance with accepted practice. Safety regulations permit personnel to work on the plumbing when pressurized with oxygen. These instructions are covered in CARDE Trials Section Trials Instructions No. 60/11 for Trials of 7 in. "Gas Gun" dated Sept. 1960. Reference is made in para 4j to Appendix "Q" to Standing Orders for Trials Section 13 May 1959 which authorizes in para 12(c) (4) repair of leaks under oxygen pressure. The regulations are not specific regarding the location of personnel during loading i.e. when oxygen is flowing. While the system had been proven "safe" during five leak-check cycles, we do not believe that personnel should have been near the gun while gas was flowing. There was no "bending" of regulations since this point is not clearly defined.

In view of all the circumstances the Board cannot see where any blame can be placed on any individual or group, rather it was a case of familiarity and past safe performance leading to a lack of respect for the possible hazard which might exist during gas flow.

(c) Recommendations on any Necessary Changes to the Regulations

1. It is recommended that leak-checking of gas guns be done with nitrogen or helium. After aborting to atmosphere the gun should be "over-charged" with oxygen and then aborted to the correct oxygen loading pressure. Should leaks develop during the oxygen loading it would be necessary to abort and find them with a nitrogen leak-check. Thus no person is near the gun or fixing leaks during any period when there is oxygen in the system. The only argument against such a procedure is the delay in firing caused by this technique. The Board suggests that oxygen be treated as an explosive gas for a trial period which will allow the delay to be assessed. Should the procedure result in serious delays, as demonstrated in practice, then the Special Hazards Committee should be asked to relax this ruling to allow personnel to fix leaks at some certain static maximum pressure while suitably clothed and protected by appropriate metal guards around potential danger spots. The period of "over-correction" will assist in implanting the necessary hazard appreciation in all personnel before returning to a calculated risk

- 3 -

at such time as steps have been taken to adequately provide safeguards.

2. In any event no personnel should be in the "danger area" while gas is flowing. If Trials Section feels it is necessary to observe the gun during loading to spot fires that may damage equipment, then this "danger area" must be defined for each range. Suitable viewing shelters should be investigated.

3. All transducers and gauges which can come in contact with oxygen gas should be calibrated by an inert fluid or a gas system. Because of the difficulty in cleaning a Bourdon tube, transducers and gauges used with oxygen are normally calibrated using an inert fluid such as glycerine or in parallel with a dry master standard gauge using air or nitrogen. For high pressures, hydraulic methods using Kel F fluid or perhaps a silicone oil would likely be necessary.

4. The line filter should be investigated to determine whether a safer type and better location can be found.

(d) Other Recommendations

1. Some confusion exists in the interpretation of the regulations regarding injuries. It would be better to stress the importance of getting the serious injuries to the hospital rather than the CARDE nurse. The Board commends the first aid treatment in this accident.

2. The CARDE ambulance which is used as the Open Range taxi should be equipped with the following:

- a. Two stretchers
- b. Six blankets
- c. Two pillows
- d. First aid kit c/w splints
- e. One 15 ton "Porter-Power" hydraulic jack assembly
- f. Two 6 ft. crowbars

3. There appears to be a need for some "controlled experiments" with regard to oxygen effects on proposed equipment and materials. Alternatively, personal visits to plants, such as Linde, might provide the necessary answers to some of the gas gun problems.

Approved: C.D. Martin
H.M. McMahon
Lt. E.W. Rance
J.S. Watson

5 July 1961

000403

APPENDIX "A"

MEMORANDUM

To: Mr. C.D. Martin File: CARDE 105-1
FROM: Deputy Chief Superintendent Date: 23 June 1961
SUBJECT: Accident Investigation

1. You are requested to act as Chairman of a Board of Enquiry to investigate the accident which occurred on "R" Range on Thursday, 22 June 1961. The Board will consist of the following in addition to yourself:

Dr. H. McMahon
Lt. E.W. Rance
Mr. J.S. Watson

2. The terms of reference of your enquiry will be:

- a) To determine the cause of the accident.
- b) To determine if all the required safety procedures for the facility were being observed.
- c) To make recommendations on any necessary changes to the regulations.
- d) To make any other recommendations that may be necessary.

3. A report should be submitted to the undersigned and it will be discussed by the Special Hazards Committee at its next meeting.

RFW/mol

(R.F. Wilkinson)
Deputy Chief Superintendent

c.c. Dr. H. McMahon
Lt. E.W. Rance
Mr. J.S. Watson
Mr. R. Perusse

APPENDIX "B"

MEMORANDUM

To: OIC Trials Section

File: 9910-35

From: P. Solnoky
Field Engineering

Date: 28 June 1961

Subject: Technical Considerations of the Failure of High Pressure Loading System Components at "R" Range on the 22nd of June 1961

1.0 On June 22, 1961 an oxygen fire occurred in the high-pressure pipe line mounted on the control valve panel situated beside the 7 in. LGG on "R" Range. The intensity of the fire caused the pipe to melt and the ensuing jets of flame injured the gun captain walking beside the installation.

2.0 Description of Valve Panel

2.1 The control valve panel is a brand new installation consisting of five H.I.P. valves, with a minimum of 30,000 psi pressure rating normally open or normally closed, depending on their intended function. The panel also contains one or more high and/or low pressure transducers for the remote recording of gun charging pressures and an H.I.P. Line Filter located before Valve #1. All piping is 9/16 in. H.I.P. tubing with a continuous pressure rating of 15,000 psi, assembled with compatible H.I.P. pipe line fittings.

2.2 The general layout and arrangement of the complete high-pressure loading system is according to CARDE design and drawing, which were safety approved before actual installation.

2.3 Official drawings and photograph are available of the general configuration of the panel, as are the actual failed components. Since these will presumably be submitted to the investigating committee, this report will therefore, be restricted to the examination of technical facts and procedures preceding the accident and the possible causes of the fire.

3.0 Usage of Oxygen

The source of energy for the so-called single stage hypervelocity launchers is the combustion of a 90:10 hydrogen-oxygen mixture. Before the combustible mixture is introduced into the gun launcher, a final "leak-check" is made on the gun assembly to ensure that no path is open for the high temperature ignited gas mixture to act as an oxy-hydrogen cutting torch. This could ruin a costly gun or cause an external explosion by a concentration of hydrogen-oxygen or hydrogen-air outside the gun.

- 2 -

Until approximately Oct. 1960 this leak-check was performed by pressurizing the gun chambers with nitrogen or compressed air. At that time with the same 7 in. LGG a phenomenon called "torching" occurred. Torching manifests itself by the spontaneous combustion of oxygen and hydrogen at low pressures (as opposed to premature firings at higher pressures), in this case as soon as hydrogen was introduced on top of the oxygen at 150 psig already present in the chamber. Once the ignition was triggered, the hydrogen loaded through the parts sustained combustion until the available oxygen was used up.

The result of this phenomenon is that one or more high temperature jets from the loading ports are impinging on the inner wall of the gun chamber, changing the heat treatment of the steel at localized areas and thereby altering its physical properties and reducing the pressure rating of the gun, or ruin it altogether.

Subsequent investigation into the cause of "torching" by various CARDE and outside experts suggested that the ignition was triggered by the reaction of oxygen with minute quantity residual contaminants on the chamber wall. These may be deposited there by the handling and insertion of various components and by the cleaning solvents used.

- 3.1 In order to reduce the possibility of "torching" it was recommended that an attempt should be made to oxidize these contaminants before hydrogen is introduced in the gun. As there was some suspicion that the reaction is pressure dependent, it was suggested that the gun chamber be pressurized to 500 psig with oxygen and this pressure is maintained for 10-15 minutes then the gun to be returned to 0 psig. The actual gun charging procedure would start after this oxygen flush.

The 10-15 minute pressurized period could be used for "leak-checking" with audio or "soap-solution" methods.

- 3.2 This recommendation was adapted as part of the regular procedure for all single stage guns, but was subsequently changed by the proper authority to only to reduce the oxygen pressure from about 500 psig to the required oxygen loading pressure instead of completely aborting it.
- 3.3 The same procedure was in force during the period when the 7 in. LGG was prepared for firing.

A total of 6 leak checks were made between 15-22 June 1961, before the accident happened.

4.0 Mechanism of Failure

- 4.1 A visual examination of the installation shortly after the failure indicated the following:

- 3 -

The fire appeared to have started in the sintered stainless steel plug of the line-filter, probably by the reaction of oxygen and accumulated oil or grease in the filter. This statement is substantiated by the fact that there is no evidence of fire damage on the upstream end of the line-filter fitting and that the downstream end of the fitting shows distinctive heat discoloration. The heat of combustion apparently quickly raised the thinner inner sections and the threads of the heavier components, such as the line-filter housing, connecting unit, and #1 Valve T-junction, above the melting point of the metal and the 900 psi oxygen supply blew the molten metal ahead through these components. Past the #1 Valve T-junction the flame reached the first larger section of 9/16 in. pipe and burned through it immediately beyond the coupling unit.

The direction of the flame travel is indicated by the narrow V appearance of the cut on the remaining pipe with the point of the V being aligned in the direction of the gas flow and also by the direction of travel of the molten metal that was blown on top of the work bench some twenty feet away causing a minor fire.

4.2 The duration of the oxygen fire in the system is judged to be extremely short as indicated by the fact that where the metallic mass of the components was comparatively large, as in the case with T-junctions and coupling units, there was no sign of external damage. This statement is also borne out by control personnel who estimate the total time of oxygen flow around 30 seconds.

4.3 It is felt that injury to the gun captain was caused not by a single direct jet of flame but a number of reflected flames.

Examining the damaged parts of the loading system it is evident that "burn through" occurred in a number of places.

First, right between the line filter housing and the coupling nut, between this coupling nut and the Valve #1 T-junction, in the left gland unit of the T-junction and finally in the pipe itself. The location of the burned-out sections, in the parts where it is ascertainable, shows a downward and away from the panel direction. The slight damage to the paint on the mounting panel suggests the same conclusion.

The jets of flame emanating from these, "burn-throughs" were impinging on the concrete floor less than a foot away and were probably deflected upwards and away from the panel.

- 4 -

Because of the short duration of the fire, it is fair to assume that all these jets were active simultaneously, thus constituting a "wall of flame". This may help to explain how the gun captain walking upright and some distance away from the panel sustained injuries to his left leg and his hands.

5.0. Possible Sources of Contaminants

- 5.1 If the assumption that the fire was caused by oxygen and oil reaction in the filter element is taken as valid, then the possible sources of the oil should be explored.
- 5.2 It must be pointed out that the system was flushed with high pressure oxygen five times during the leak checks before the fire occurred. Therefore, any residual oil or other contaminant that was present in the system should have been oxidized.
- 5.3 Detailed investigation for any alterations in the system during this period revealed that after "leak-check" #4 on the 20th June 1961, a High-Pressure Transducer was installed in system. It was until then in use on the 2 in. LGG. The location of the transducer at the 7 in. LGG was just ahead and above the line--filter fitting. This pressure transducer previous to its installation was calibrated by the Instrumentation Section of Aerophysics Wing, by a dead-weight tester using hydraulic oil. After calibration it was thoroughly cleaned with trichloroethylene.
- On the 22nd June 1961, after leak check #5 Valve #2 was replaced by an other operational valve from the 2 in. LGG system because of leaking air-bellows in the original valve.
- No other alterations were made anywhere in the sytem between the original installation date and the date of the accident.
- 5.4 The possibility of contamination from Valve #2 is very remote. It was used continuously for some time in a charging system in presence of oxygen, then it was removed and simply transferred to the 7 in. LGG system without the chance of getting in contact with greases or oils. Visual examination of the valve revealed no direct damage except some particles of molten slug blown through the piping by the high pressure oxygen.
- 5.5 The transportation of contaminants through the main supply line from the oxygen manifold to the line-filter, although not impossible, is at least highly improbable. Each component of this pipe line was thoroughly cleaned before

- 5 -

being joined together, followed by the cleaning of the complete assembly by forcing trichloroethylene through the pipes. The end of the line was then closed off just ahead of the valve panel and pressurized with oxygen for some time. Finally the whole line was blown through with oxygen for approximately 2-3 minutes with the end of the pipe line open to atmosphere.

- 5.6 By the process of elimination the greatest suspicion is directed to the High-Pressure Transducer as the most probable source of oil.

This conclusion would be almost automatic if the fact that a "leak-check" with oxygen was performed with this transducer installed without any incident before the fire occurred, would make such an outright statement somewhat illogical.

Despite of this apparent contradiction, factual evidence and engineering intuition still strongly points to the transducer as the triggering source for the fire. A logical explanation can be made if the following hypothesis is accepted.

- 5.7 The transducer was calibrated with oil. Subsequently it was cleaned with a solvent. The time allowed for the evaporation of the solvent before installation in the systems is indeterminate. Therefore it is possible, since the transducer is of a closed volume construction, that some oil bearing solvent and/or vapor was trapped inside the transducer when it was installed. The configuration of the transducer assembly and its location is such that the following condition could exist: Some solvent and oil film on the transducer walls plus some vapor entrapped in the upper part of the assembly, a vapor air interface slightly below and an air column filling the lower part of the small diameter pipe right to the junction of the 9/16 in. line. It is suggested that when the oxygen was turned on for Leak Check #5, this oxygen merely compressed the air-column without getting in actual contact with the oil or oil bearing vapor in the transducer.

It should be pointed out that this day (June 21) was a cloudy, rainy day, therefore the moveable overhead cover of the 7 in. LGG was closed. Thus it is fair to assume that all parts of the system were at approximately the same temperature.

The next day (June 22) was bright and sunny. The overhead cover was rolled back exposing the valve panel to the direct rays of the sun. It is estimated that the metallic parts of the system, including the transducer, may have been raised in temperature by as much as 100°F over the ambient.

- 6 -

The effect of this temperature rise on the transducer could have been the expansion of the enclosed gas volume, resulting in the expulsion of the air column and the liberation into the main line of the solvent vapours and possibly some of the lighter components of the hydraulic oil residue.

The migration to and the collection of these contaminants in the filter element could have been in this manner:

Valve #1 is a normally open valve, serving as the main loading line vent. Valve #2 is normally closed. Thus the whole line from the transducer to the end of the vent pipe at the side of the gun shelter was open to atmosphere. Due to the temperature difference between the gas in the pipe and the atmospheric air, a pressure differential existed in the system. In essence the pipe line acted as commonly used pneumatic remote temperature indicator, working on a gas or mercury expansion bulb principle but with indicator end open to atmosphere.

It is conceivable that the oil vapours were transported by this flow mechanism to the filter element and there were collected and/or condensed either by the efficiency of the filter or because of comparatively large pressure drop presented by the filter or by the lower temperature of the filter element or by the combination of all three.

Thus when leak check #6 was started, still in brilliant sunshine at 3 p.m. the constituents to trigger off the reaction were in the appropriate location.

5.8 In order to account for the fact why the transducer itself did not explode or burn, the explanation is offered that as soon as Valve #1 is closed and before Valve #2 is opened, the above mentioned pressure differential ceases to exist as the pipe line becomes a closed vessel. Thus the air column principle, separating residual vapours from the oxygen in the transducer assembly, again takes effect.

6.0 General Comments

6.1 Cleaning of Tube Filters

Based on trouble-free operating experience with the 14 in. and 3.86 in. LGG's the schedule for the cleaning or exchanging of the line filter elements was set at after each 10 firings.

6.2 Calibration of Piezo Gauges and Transducers

The calibration of these gauges with hydraulic oil is fairly long standing and accepted method by the various instrumentation groups at CARDE, according to the information received.

- 7 -

Until this time it provided trouble-free service with a large number of shots. A supposedly careful degreasing operation follows the calibration in each case.

6.3 Degreasing Solvent

On the hypervelocity ranges it is exclusively trichloroethylene.

7.0 Conclusions:

On the basis of the presented facts and assumptions it is concluded that the fire resulted from the incomplete cleaning of pressure transducer from the calibrating oil, in conjunction with a fairly nebulous set of coincidences.

8.0 Recommendations:

- 8.1 Oxygen should be declared as an explosive gas for the purposes of usage in Light Gas Guns.
- 8.2 The calibration of transducers and other instrumentation components that may come in contact with oxygen should be discontinued.
- 8.3 "Leak-Checking" of gas guns should be performed with insert gases or compressed air.
- 8.4 Exposed valve panels should be provided with appropriate flame shields but "not to be enclosed". "Plexiglass" is not acceptable as flame protection. Lucite (Plexiglass) melts around 200°F, and it is difficult to decide which is worse, direct flame or a faceful of molten plastic.
- 8.5 The advisability of line filters in the gas loading system should be investigated.

9.0 Action Taken

Para 8.1 and 8.3 were already implemented by action between gas Dynamics Section and Trials Section by an interim set of revised procedures. Para 8.2 is implemented by the ordering of non oxydizing oil for the calibrators. Para 8.4 is in the design and manufacturing stage. Para 8.5 is under discussion.

Paul Solnoky

Mr. C.D. Martin
Dr. H. McMahon
Mr. J.S. Watson
Mr. R. Warnica

PS/gl

APPENDIX "C"

ACCIDENT REPORT

FAILURE OF 7" LGG VALVE ASSEMBLY PANEL

Prepared by: Lt W. C. Higgins
Trials Officer, "R" Range

BACKGROUND

1. Preparations for the proof of the 7" LGG were being carried out at "R" Range. Several leak tests had been made and work was proceeding on eliminating a gas leak in the piezo gauge line inside the gun chamber. Small leaks in the valve panel connections had already been eliminated. O₂ was used on the first leak checks so that any grease or oil in the chamber would be burned out prior to loading. No. 2 valve showed an air leak in its bellows on 21 June 61 and this valve was replaced on morning 22 June 61 by a new valve, that was a proven valve and inspected prior to installation.

OPERATION

2. Just prior to the time of the accident the operations on closing the breech were completed. All necessary work was completed at 1435 hours for a gas leak test. The Gun Captain, Artificer and Range Engineer representative remained at the gun position for this operation to check on any leaks that may occur. An Instrumentation Section representative was also present to check the electrical circuit operation.
3. When requested over the intercom system to apply pressure the main O₂ supply was opened and pressure of approximately 900 psig applied to the system. A buzzing noise was heard over the intercom and abort valve switches checked. When requested over the intercom what the noise was the reply came back to turn the supply off. The buzzing sound ceased.
4. The Gun Captain, Mr. John Beaulieu appeared from around the 7" abutement accompanied by the artificer, Ssgt H Campbell. When queried he stated he was burned on the hands and that he felt OK. The hands did not appear badly burned and he was directed to be taken to the Control Room and to be checked by 1st Aid men. When he removed his trousers second degree burns were seen on his left leg in the area between his knee and lower shin.
5. The Range taxi ambulance and the CARDE nurse were called at approximately 1455 hours. Mr. Beaulieu had dry dressings applied to the major burn areas. When the ambulance arrived at 1500 hours he was despatched for treatment and accompanied by two men for physical assistance. He appeared to be in a state of shock at this time.
6. Concurrent with the application of 1st Aid to Mr. Beaulieu the 7" gun shelter was checked and fire discovered on the work bench approximately 25-ft distant from the valve panel. This fire was easily extinguished.
7. The accident area was later checked, indications at the valve panel showed that the line had burned through at the exit end of the line filter. Line and fittings adjacent to Valve No. 2 were also burned.

- 2 -

8. Preliminary Opinion - From the operations and evidence immediately after the accident the opinion of the Trials Officer is:

- a. The burning through of the gas line could have been caused by grease or oil in the filter valve although the presence of oil or grease is unaccountable.
- b. The minor fire was caused by flying molten metal.
- c. The Gun Captain was walking by the valve panel after checking the vacuum pump at the muzzle end of the gun.

9. Safety - All safety measures as applicable to the 7" LGG were observed and effective in their application. There were no indications of an unsafe condition prior to this accident.

10. Recommendations - An accident of this type is unaccountable - unless further evidence becomes available to prove otherwise. In addition to present safety measures in existence it is recommended that:

- a. All initial leak check be done by using Nitrogen.
- b. When O_2 is applied to a system at any time personnel be directed to stand clear at least 25-ft, for two minutes before investigating the system for small leaks.

28 June 61

APPENDIX "D"

MEMORANDUM

To: Mr. C.D. Martin

File: CARDE 550/1

From: H. Matte, R.N.

Date: 4 July, 1961

Subject: Accident, Mr. Jean Beaulieu

Accident: 22 June, 1961, at 1445 hrs.

Nature of accident:

1° and 2° thermal burns to left lower limb.
Torn tendons to right 4th finger.

Emergency treatment:

Large sterile dressings (Shell Drsg) applied at the place of the accident, by S/Sgt Campbell, RCA., immediately after the accident, 1445 hrs.

Arrives at Health Center, by ambulance, at approximately 1510 hrs. Mr. Robert Watson, from Propulsion Wing, an attendance at Health Center examining the dressings, realizes that they have been well applied and secured, and that this casualty requires Medical attendance. So, the casualty is immediately sent by ambulance to Station Hospital, Camp Valcartier.

At Station Hospital, Camp Valcartier, this employee is seen by Capt. Beausejour, RCAMC., (herewith attached Capt. Beausejour report), and appropriate treatment is applied to the burnt areas. The casualty is then sent to his home, for further treatment by his personal physician.

Seen in the evening of 22 June 1961 by Dr. Gerald Corriveau, 150 S. Georges st., Levis, who was contacted by phone by the CARDE nurse. His diagnostic is:

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Responding well to treatment, healing processes normal.

Probable absence from work:

H. Matte, R.N.

APPENDIX "D"

Valcartier Station Hospital,
Camp Valcartier, Que.

30 Jun 61.

This is to certify that Mr. Jean Marie Beaulieu, a
civilian employee of CARDE, was treated at Valcartier
Station Hospital on 22 Jun 61 at 1510 hrs. by the
undersigned for second degree burns of the left leg.

(JFA Beausejour)
Capt
Officer in Charge

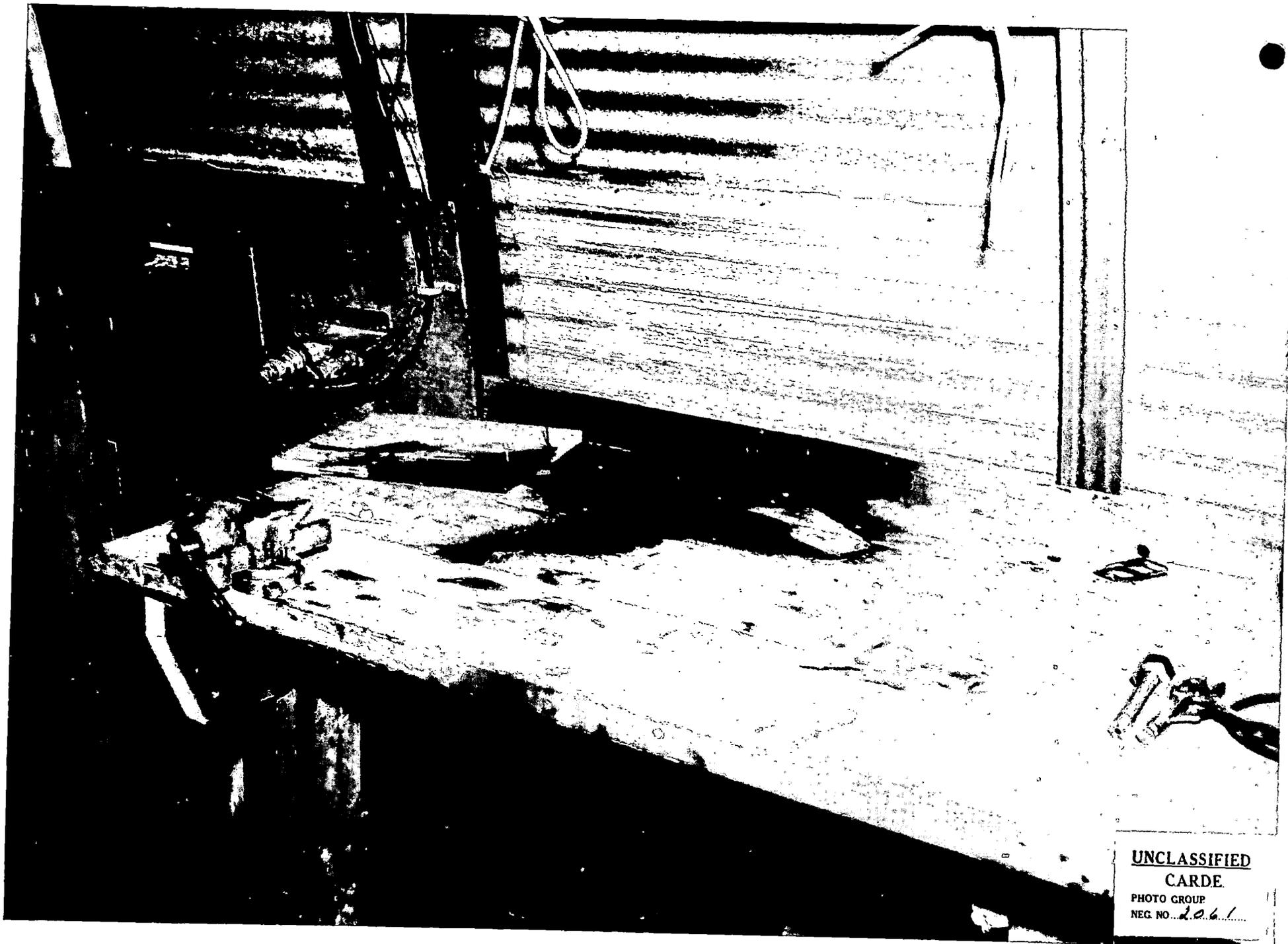


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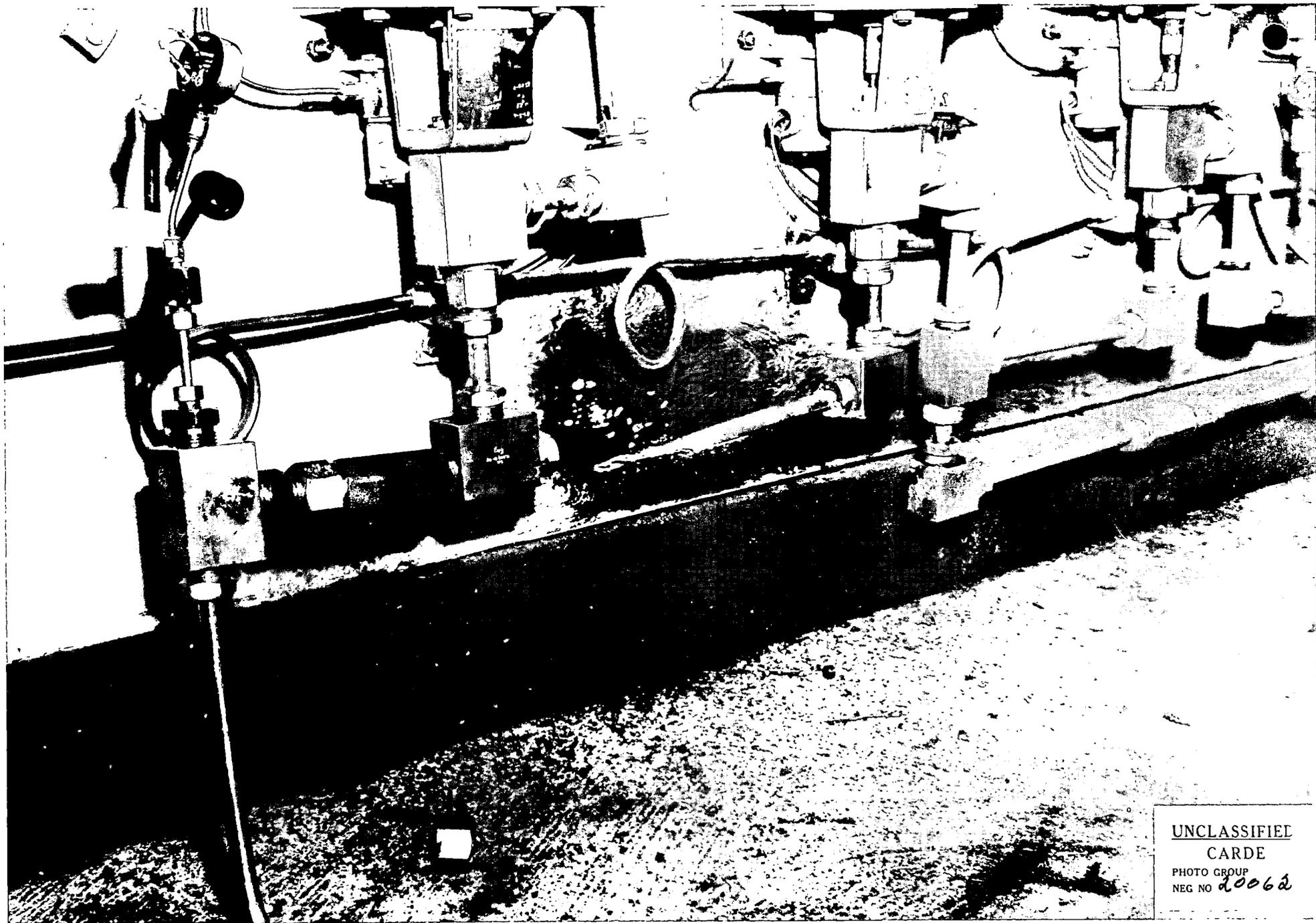
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IN REPLY PLEASE QUOTE

CARDEC 105-1



DEFENCE RESEARCH BOARD
CANADIAN ARMAMENT
RESEARCH AND DEVELOPMENT ESTABLISHMENT

P.O. Box 1427,
Quebec, P.Q.

27 August, 1959.

DEPARTMENT OF NATIONAL DEFENCE
CANADA



Chairman,
Defence Research Board,
Ottawa, Ont.

Handwritten initials/signature

Referred to... *W.S.*.....
AUG 26 1959
File *DRB 105-15/0*
Chgd to *W.S. 27-8-59*

Board of Enquiry

Range No. 2 Gun Accident - 29-7-59

- Further to CARDEC 31 July, 1959, attached please find two copies of Report on Accident at Bldg. 240 on Wednesday, 29 July, 1959. The attached is the final report on the accident.
- All recommendations are being implemented.

Handwritten notes:
CofE through DWR
Please note attached report on accident in Bldg 240 at CARDEC.
CA witness
Prks.
1-9-59.

Handwritten signature
(L.J. L'Heureux)
Acting Chief Superintendent

Handwritten note:
See Bob 29-59.

Handwritten signature

H.M.B.
C & E
8 1959

Report of the Board of Enquiry on the

Accident at Bldg 240 on Wednesday 29th July 1959

Introduction

On Thursday 30 July 1959 the Acting Chief Superintendent convened a Board of Enquiry to investigate an accident which occurred on Range 2 Bldg 240 on Wednesday 29th July 1959 at approximately 5.40 p.m. (See memo CS 128 dated 31 July 1959 as Appendix A). The Board consisted of R.F. Wilkinson (Chairman), Dr. G.V. Bull, H. Jones, R. Perusse and L.F. Smith (Secretary).

The Board examined the results of the accident and took evidence from the people concerned on 30 July and met on 31 July to approve a preliminary report which was passed to the Acting Chief Superintendent for forwarding to DRB Headquarters.

The Board met again on Tuesday 4 August and later approved the final report to be passed to the Acting Chief Superintendent.

In the report which follows, each of the points raised in the memo CS 178 are considered in turn and then conclusions and recommendations are enumerated.

(a) The Facts about the Accident

(i) Description of Range No. 2

Range No. 2 is located in and adjacent to Bldg 240 on the South Site of the Establishment. It consists of a hypervelocity gas gun, of 2 in. calibre, which is located entirely within Bldg 240, gas storage cylinders and control panel which are located outside the building adjacent to its north-east wall and gas supply lines which pass through the north-east wall of the building connecting the main and secondary chambers of the gas gun to the control panel.

It should be noted that at the time of the accident both the location of the control panel and the control panel installation were of a temporary nature. A permanent control panel is scheduled to be installed in an extension to the north-west end of Bldg 240, which was being constructed at the time the accident occurred.

Photograph 15130, taken after the accident, shows the hydrogen and oxygen supply cylinders together with the control panel and photograph 15131 shows the control panel. Fig. 1 shows the overall layout of the range and Fig. 2 is a schematic of the principal sections of the gas gun and the control valves for the gas supply lines.

With reference to Fig. 2, valves E and D control the flow of gas from the oxygen and hydrogen supply cylinders respectively, connecting the cylinders to the common supply line feeding the main and secondary chambers of the gas gun. Valves A and B control the flow of gas between the common supply line and the main and secondary chambers of the gun respectively. A pressure gauge, graduated from 0-3000 psi, is located on the common supply line and the valve C permits gas in the common line to be exhausted to the atmosphere.

-2-

(ii) Normal Loading Procedure

The normal loading procedure for the gun consists of three distinct phases. Phase 1 is the loading of the Heller propellant behind the piston in the main chamber of the gun. Phase 2 is a gas purging or flushing operation in which oxygen at 1000 psi is fed to the main chamber only of the gun and then exhausted to the atmosphere. This flushing operation is carried out twice before proceeding with Phase 3, the final charging of the gun. In Phase 2 valves B, C, and D are closed, valves A and E are opened until the pressure gauge reads 1000 psi and valve E is then closed. To exhaust the oxygen from the main chamber, valve C is now opened and left open until the gauge reads zero, whereupon valve C is closed and the cycle repeated. In Phase 3, valves B, C, and D are closed and valves A and E opened until the main chamber is loaded with oxygen to 100 psi, as indicated by the gauge. Valves A, C, and E are then closed and valves B and D opened until the secondary chamber is filled with hydrogen to 800 psi. The final operation in Phase 3 of the loading procedure is with valves B, C, and E closed to open valves A and D and load the main chamber with hydrogen to 1000 psi. Valves A and D are then closed and the gas gun is ready to fire.

(iii) Description of the Accident

The accident occurred at approximately 5.40 p.m., on Wednesday, 29 July 1959. Phase 1 of the loading operation had been completed and the first purging operation of Phase 2 had commenced at about 5.35 p.m. Standing left to right, facing the control panel, were Chamberland, Coderre and Maiden. Chamberland and Coderre were carrying out the loading procedure and Maiden was present to supervise the operation. Normally, only one operator, Coderre, carries out Phase 2 of the loading procedure but on the day of the accident Chamberland was present for the purpose of being instructed by Coderre on the proper loading procedure. As the purging operation commenced, Brown, who was in charge of the spectrograph equipment inside Bldg 240, entered the loading area to obtain further clarification on the arrangements that would be made for him to open the shutters on his equipment. Brown stood next to Chamberland. Two or three minutes after the charging of the main gun chamber with oxygen had commenced, an explosion took place. The oxygen pressure in the chamber immediately before the explosion was approximately 60 psi, as indicated by the gauge. The explosion blew fragments of glass and metal into the area immediately in front of the control panel. Coderre and Brown suffered injuries; Maiden and Chamberland were unhurt. Coderre, when he realised that something had gone wrong, turned off the oxygen control valve C, threw himself on the ground and rolled away from the building; Brown turned away from the control panel and ran from the area. Immediately after the explosion, Maiden, Brown, Coderre and Chamberland went to the Guard House, where they reported the accident and had an ambulance called from the Valcartier Military Camp.

Copies of statements taken from the four people involved are reproduced as Appendices B to E of this report.

(b) Injuries to Personnel

The injuries suffered by Coderre and Brown are described in the attached Appendix F.

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-3-

(c) Damage to Equipment

The damage to the equipment as a result of the accident was restricted entirely to the control panel. The pressure gauge was shattered, the oxygen control valve E was badly damaged and the pipe connection joining control valve E to the common line was ruptured. The general extent of the damage can be seen in photographs 15130 and 15131.

As part of the enquiry a detailed examination was made of the control system. On dismantling it, abundant evidence was found of grease both within the valves and on many of the pressure seal joints. Samples of the greases were taken from valves A and E and also the fractured Bourdon tube from the gauge. A copy of the analytical report is reproduced as Appendix G. It is apparent that the grease was of the hydrocarbon type.

Photograph 15182 shows the fractured Bourdon tube from the gauge. It is apparent that it burst when subjected to a pressure considerably in excess of the rated 3000 psi. In addition to the grease within the tube the threads were heavily greased.

Photograph 15180 shows a section of the connections to the gauge and the Bourdon tube mount. All joints were greased and a considerable amount of metal removal and deposition was apparent except in the heavy brass connector.

All the connections between valve E and the gauge contained a deposit and many of the narrower channels had been enlarged by combustion or erosion.

Photograph 15181 shows a section of valve E with a similar section of the undamaged valve A for comparison. It is apparent that a considerable amount of metal was removed from valve E by combustion or erosion. The photograph also shows the damaged connection to valve E.

(d) Possible Causes of the Accident

It is considered that there is little doubt that the accident was caused initially by a reaction between oxygen and grease which was found throughout the system.

The exact sequence of events is not absolutely clear but it is considered that the following is the most likely. A small explosion occurred within valve E resulting in a general increase in pressure and the spreading of hot combustion products throughout the accessible part of the system. The hot gases and the associated turbulence probably caused other quantities of grease and oxygen to react in other parts of the system including the gauge. Further increase in pressure resulted and the Bourdon tube in the gauge failed. At about the same time, the connection to valve E failed and oxygen began to escape into the atmosphere. Since the valve was hot, considerable metal melting and combustion occurred resulting in the heavy deposits on exposed parts of the system. The deposits throughout the connection and valves were probably carried through the system at the time of the initial explosion.

(e) Were the CARDE Safety Regulations followed and are they adequate?

In this context "the CARDE Safety Regulations" are read to mean the regulations approved by the Chief Superintendent for the use of Hypersonic Test Facilities. The primary emphasis in these regulations has been on protection against failure of guns in firing.

.... /4

-4-

(e) (Cont'd)

No aspects of this accident have suggested that the regulations were inadequate in this respect.

The only regulation which is specially relevant to this accident is contained in para 1.2 of the regulations approved by the Chief Superintendent in CS 105 dated 7 Oct 1958 (CARDE file 9900-3) stating

"Adequate protection is to be provided for personnel and instrumentation against failure of pressure vessels and associated equipment."

This regulation was not observed adequately in the following respects:

(i) The high pressure system was not covered by a protective steel as for Range 1 and in accordance with general instructions of Supt. Aerophysics.

(ii) The gauge contained a glass window instead of a plastic blow-out window as recommended.

(iii) There was no thick protective plastic in front of the gauge.

It is considered that, at the present time, no comprehensive code of standard practice for the use of high pressure gas equipment is available within the Establishment. It is considered necessary that a code should be prepared and issued as part of the CARDE safety regulations for use by all the Wings.

It was noticed during the enquiries that the gas bottles were not fastened securely. This is in contravention of the recommendation made by Hypersonic Test Facilities Safety Committee and recorded in para 2.3.1(1) of the minutes dated 14 April 1958 (CARDE file 9900-3).

(f) Were Aerophysics Wing Safety Procedures consistent with DRB Regulations in relation to the hazards of the trial?

Except as pointed out in (e) above the procedures used were consistent with DRB regulations. It should however be stressed that it appears that the special hazards associated with oxygen gas under pressure have not, in the past, been adequately appreciated. The oxygen loading operation has not previously been regarded as a special trial hazard.

(g) Any other incidental factors which may have a bearing on the accident.

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It was noted that [redacted] had no need to be in the vicinity of the accident at the time, although it must be borne in mind that the operation in progress was not considered to be a hazardous one.

It was also noted that the two more seriously injured employees were both wearing glasses and that, although extensively cut about the face, they received no eye injuries. This experience represents strong support for use of safety glasses during the conduct of all laboratory-type operations.

Conclusions

(1) The accident was caused by the reaction of oxygen under pressure and grease which was present throughout the system.

...../5

-5-

Conclusions (Cont'd)

(2) The CARDE Safety Regulations were violated in that the high pressure equipment was not adequately protected and an unsatisfactory gauge was used. These violations were not in fact the cause of the accident but contributed significantly to the injuries sustained. [REDACTED]

s.19(1)

(3) It is probable that the special hazards associated with the use of oxygen under pressure have not been adequately appreciated in the past.

(4) Apart from (2) and (3) above the general procedures for the use of Hypersonic Test Facilities were adequately followed.

(5) After the accident the staff behaved correctly and the ambulance arrived promptly from Camp Valcartier.

(6) The injuries sustained were not serious although if Coderre and Brown had not been wearing glasses they could have sustained serious eye injuries.

Recommendations

1. All high pressure equipment for handling oxygen should be degreased before further firings are undertaken.

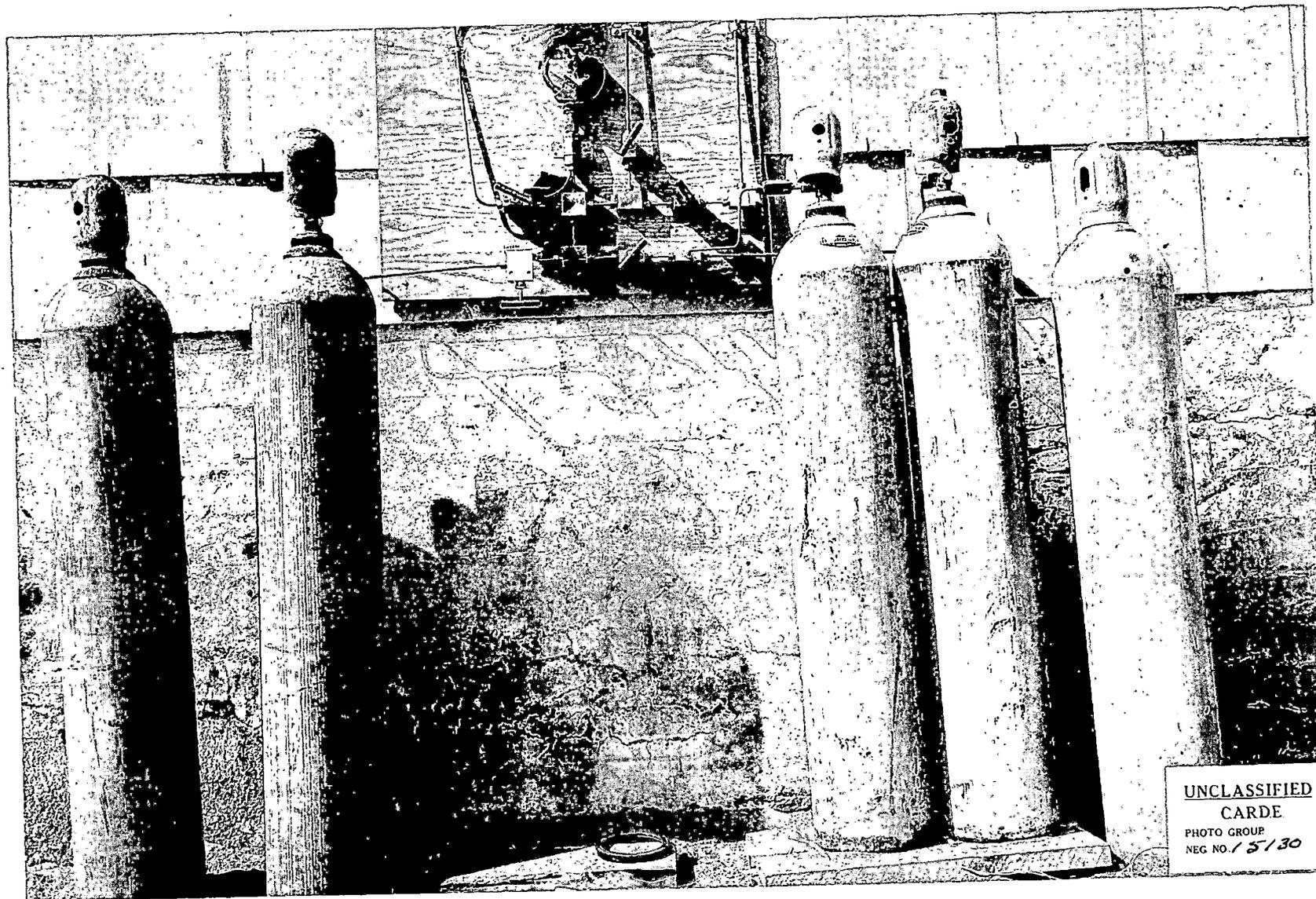
2. Since apparently each Aerophysics Wing Group Leader is responsible for high pressure gas handling equipment, it is recommended that a committee be set up to write a manual of safe practices for handling systems containing gases under pressure. The committee should consist of I.R. Cameron from Explosives Wing (Chairman), G. Kirouac from Workshops, Technical Services and each of the Aerophysics Wing Group Leaders concerned.

3. The manual of safe practices should be approved by the CARDE Safety Committee and promulgated for use throughout the Establishment.

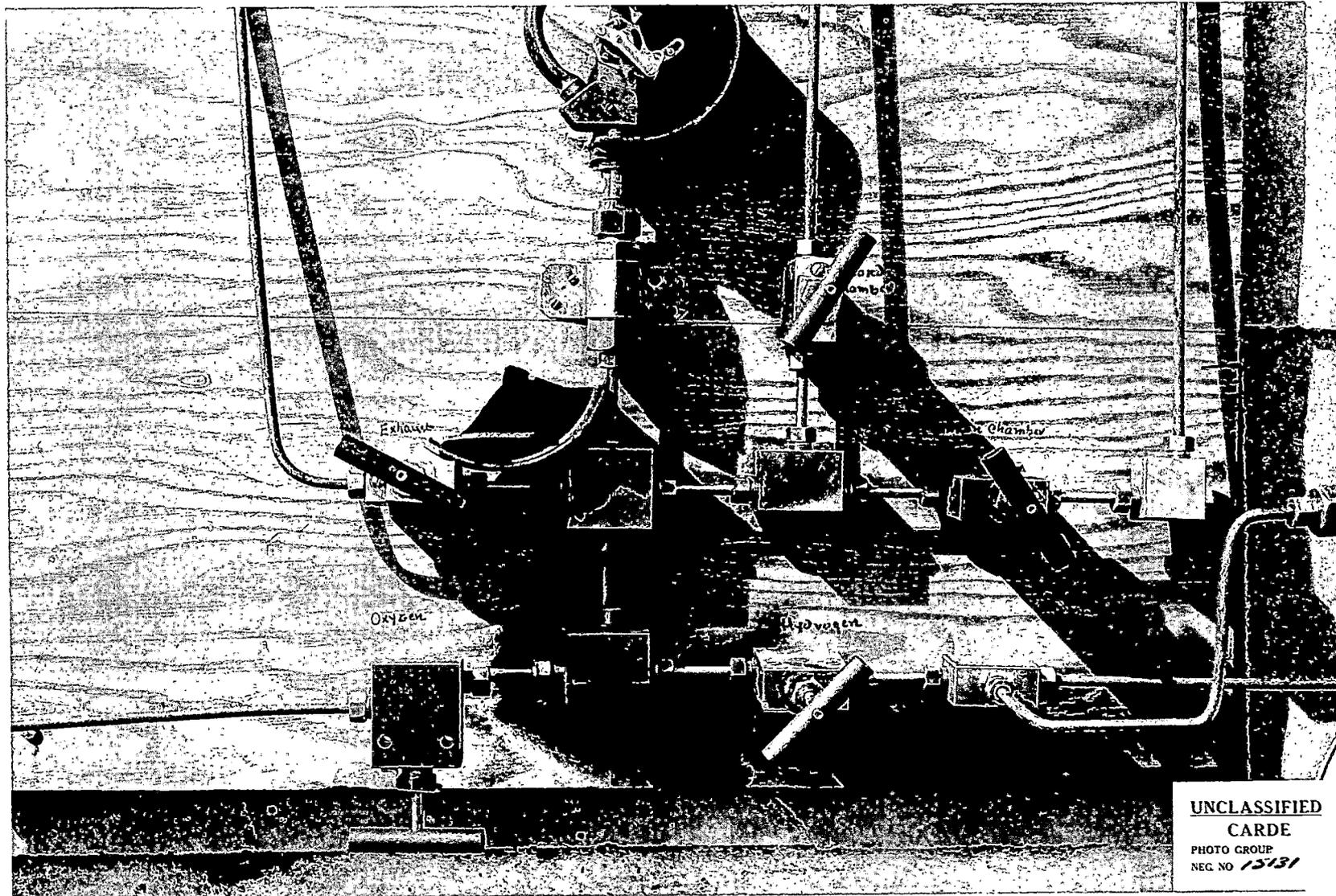
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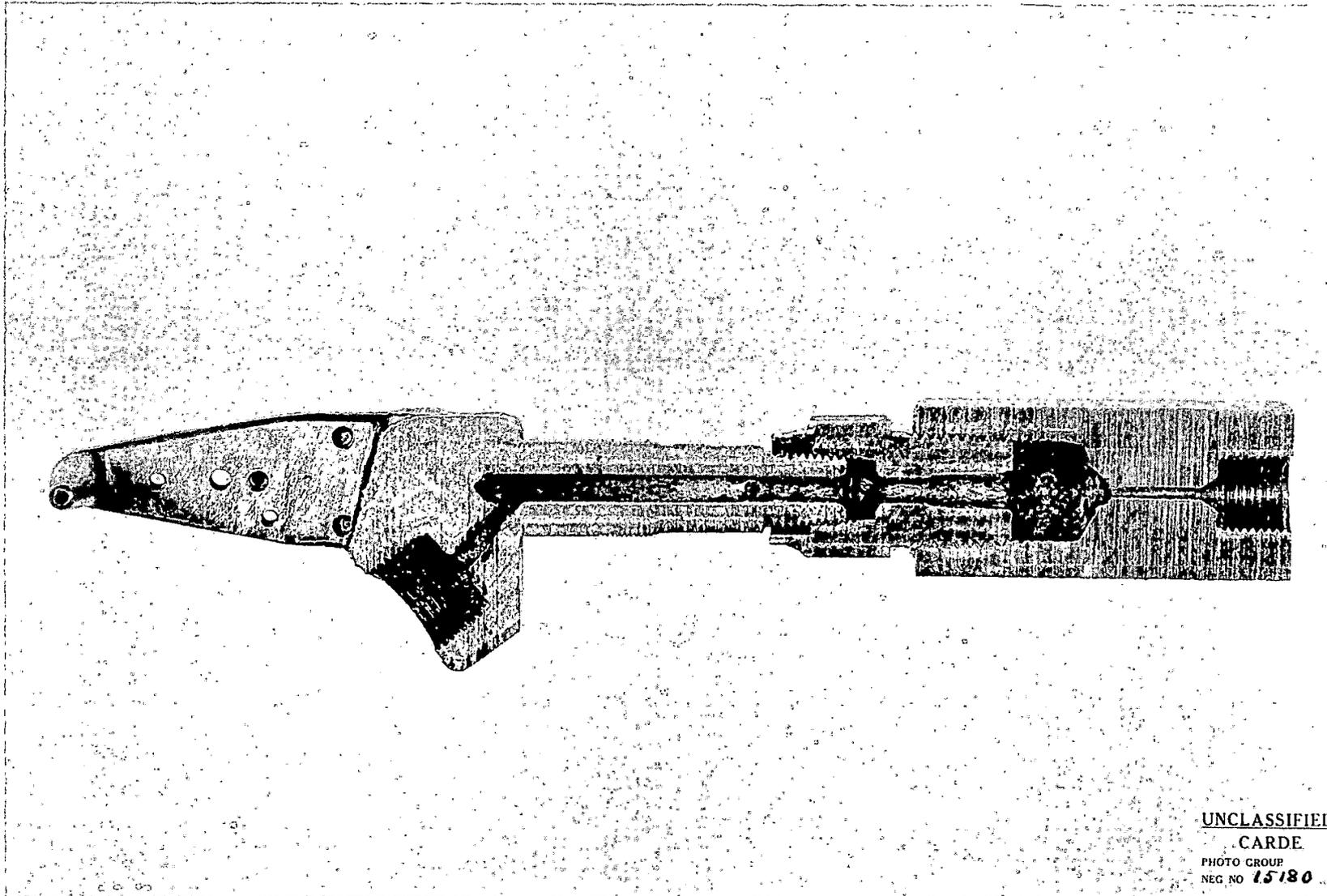
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R. Pérusse
L.F. Smith

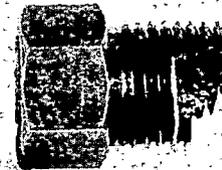
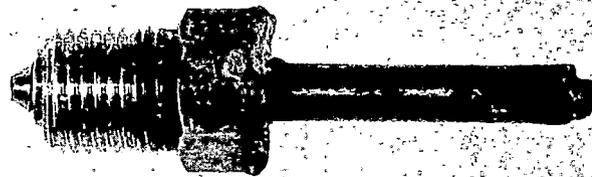
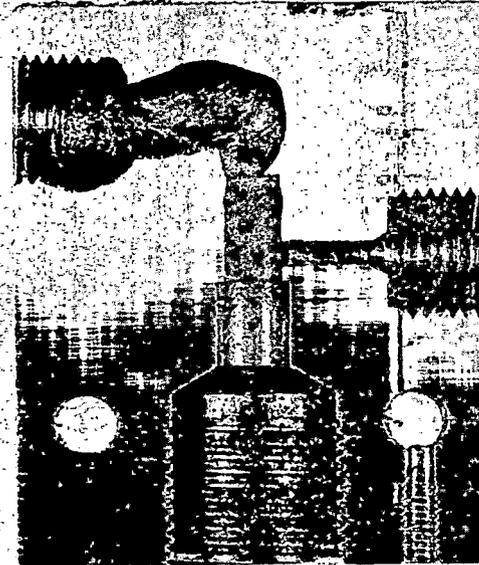
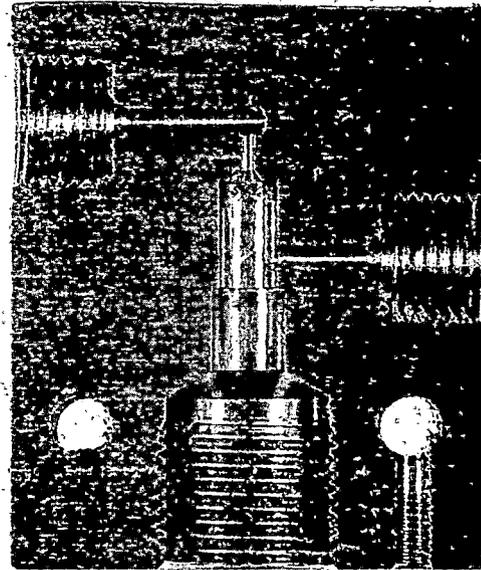
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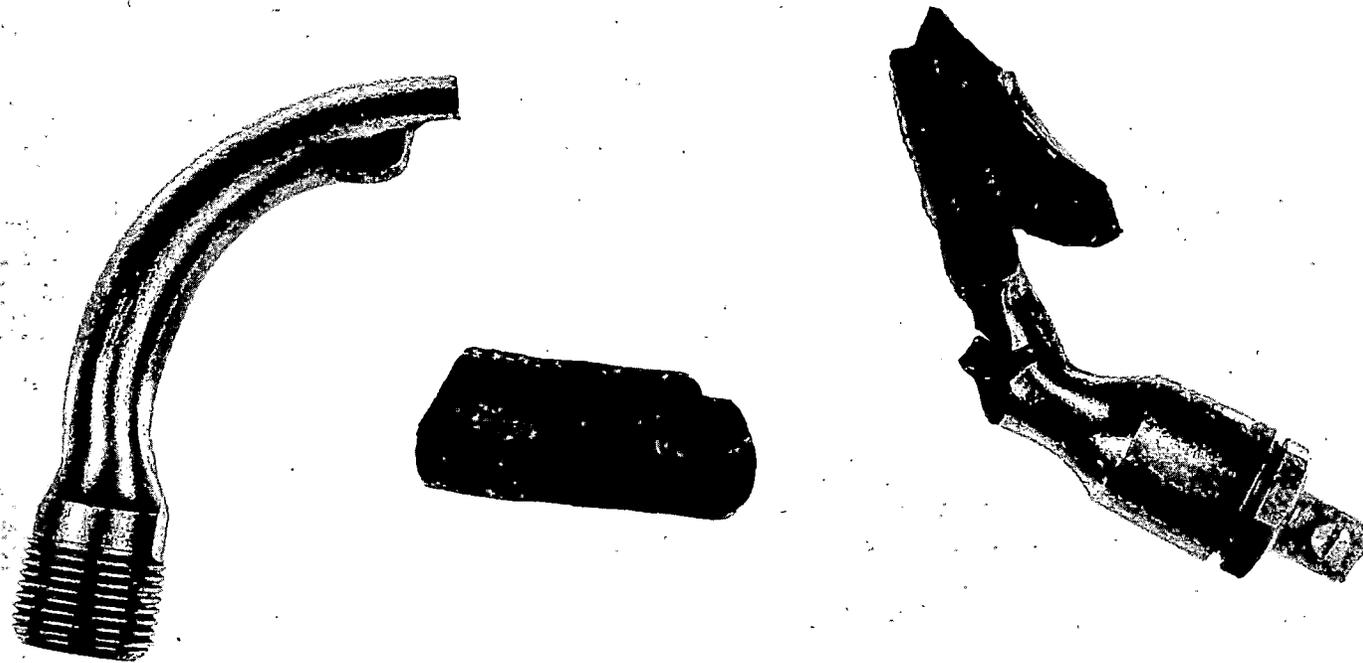
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APPENDIX "A"

MEMORANDUM

To: Distribution File: CARDEC 105-1
 From: Acting Chief Superintendent, Date: 31 July, 1959.
 C.A.R.D.E.
 Subj.: Board of Enquiry No.: CS-128
 Range No. 2 Gun Accident - 29-7-59

s.19(1) At 1800 hours, 29 July, 1959, an explosion occurred in Aerophysics Wing while No. 2 Range gun was being charged with oxygen. Two staff members [redacted] and [redacted] received injuries and are hospitalized.

I hereby appoint a Board of Enquiry with the following membership to investigate this accident:

R.F. Wilkinson	-	Chairman
G.V. Bull		
H. Jones		
R. Perusse		
L.F. Smith	-	Secretary

The Board should report on the following factors:

- (a) The facts about the accident.
- (b) Injuries to personnel. (Medical report to be included.)
- (c) Damage to equipment.
- (d) Possible causes of the accident.
- (e) Were CARDE safety regulations followed and are they adequate?
- (f) Were Aerophysics Wing safety procedures consistent with DRB regulations in relation to the hazards of the trial?
- (g) Any other incidental factors which may have a bearing on the accident.
- (h) The Board of Enquiry recommendations.

I wish an interim report by 1200 hours, 31 July, 1959, and a complete report of the Board of Enquiry's findings as soon as all the facts have been established.

Distribution

R.F. Wilkinson
 G.V. Bull
 H. Jones
 R. Perusse
 F. Smith

L.J. L'Heureux
 (L.J. L'Heureux)
 Acting Chief Superintendent

c.c. DRB - Ottawa

APPENDIX "B"

s.19(1)

REPORT OF ACCIDENT AT BLDG. 240 ON JULY 27, AT 5:40 P.M.

1- Personnel involved

Professionals: Messrs [redacted] & [redacted]
Technicians : " " [redacted] & [redacted]

2- Gas loading gun

A diagrammatic representation of the gun plus gas loading system is presented in Fig. 1. The usual gas loading system is as follows. Valves B, C and D are closed and the main chamber is filled to 1,000 psi. Valve E is then closed, valve C opened and the oxygen is exhausted to the atmosphere. This flushing operation is then repeated. Again valves B, C and D are closed and the main chamber is loaded to 100 psi with oxygen. Valves A, C and E are then closed, valves B and D opened and the secondary chamber filled to 800 psi. with hydrogen. The last loading operation is then to close valve B, open valve A and load the main chamber with hydrogen to 1,000 psi.

3- Sequence of events on July 27th.

The propellant had been loaded in the gun. [redacted], [redacted] and [redacted] went outside of the building to the gas loading area. (see Fig 2). [redacted] and [redacted] were to load the gun, [redacted] to supervise. The first oxygen filling of the main chamber commenced at about 5:35 P.M. Standing left to right in front of the loading area were [redacted], [redacted] and [redacted]. Valves B, C and D were closed, valves A and E open and the main chamber commenced to fill with oxygen. At this stage of the operation, [redacted] entered the loading area to presumably ask some question on firing time as he was operating a spectograph on the range. He stood next to [redacted].

The explosion occurred almost immediately - some 2 to 3 minutes after loading had commenced, at this time the oxygen pressure in the main chamber was approximately 60 psi. The explosion blew fragments of glass and molten metal about and [redacted] and [redacted] suffered injuries. The glass was from the pressure gauge and the metal from a section of the pipe next to valve C. The accident was immediately reported to the guard who called an ambulance from the Valcartier Camp Hospital. The two injured men were then taken first to the Camp Hospital and then to the Jeffery Hale.

[redacted]
[redacted]

APPENDIX "C"

30 July 1959

My part in the accident at Range 2 on July 29, 1959.

s.19(1)

Several minutes before the accident occurred, I had asked Dr. [REDACTED] what arrangements would be made for me to open the shutters on the two spectrographs I had installed on Range 2 and to get to safety before the gun was fired.

He suggested that we speak with Mr. [REDACTED]. We left building 240 together and walked around the end of the building to where Mr. [REDACTED] and Mr. [REDACTED] were working near the gas bottles used to fill the two inch gun.

When we arrived Mr. [REDACTED] was adjusting a valve so that the gauge would read a very high pressure and then a very low one. Dr. [REDACTED] and Mr. [REDACTED] spoke. I went closer to the gauge so that I could have a better view and watch more closely the movement of the pressure indicating needle of the gauge. Dr. [REDACTED] was just bringing up my problem when the explosion occurred. The time between our arrival at the gauge and the explosion was easily less than a minute. I was probably about two feet from the gauge.

After the explosion I turned and ran directly away from building 240 for three or four hundred feet. I then turned to see what was happening. I saw Dr. [REDACTED] with Mr. [REDACTED]. I heard someone shout something about the guard house. I ran around the front of building 240 to the guard house.

This is my statement of what happened to me at building 240.

[REDACTED]

[REDACTED]

[REDACTED]

APPENDIX "D"

STATEMENT

BY

s.19(1)

[REDACTED]

After the gun had been loaded with four pounds of propellant in the primary chamber, I went out of the building to the gage loading pannel with Mr. [REDACTED] and explained to him how the loading should be done, as he was to be in charge of loading from then on. I explained to him that the first procedure was to check that all cylinders' valves were closed, that the Aminco valve between the panel and the cylinders was also closed. The second step was to check that all the chambers were closed. The third step was to check that the exhaust valve was open. The fourth step was to close the exhaust valve and to open primary chamber valve according to whichever chamber we wanted to load first. In this case, the primary chamber was to be loaded first to a pressure of 100 pounds oxygen. Consequently, the primary chamber valve was opened. The oxygen bottle valve was then opened. Finally, the Aminco valve which sits between the panel and the cylinder was opened to let the oxygen into the primary chamber. When this pressure reached 60 psi, the pressure gage got lit over all a medium blue color flying at 45° angle outward from the meter. Then, I realised an explosion had occured. I closed the oxygen valve and rolled on the ground to about 50 feet away from the bottles, and then checked that nobody was seriously injured. I went to the guard room to report the accident.

[REDACTED]

APPENDIX "E"

RAPPORT

DE

s.19(1)

Comme d'habitude, on avait placé les diaphragmes et les pistons et le projectile dans le canon. Le canon était fermé, prêt à mettre le gas. [REDACTED] et [REDACTED] sommes allés charger une chambre du canon avec de l'oxygène. [REDACTED] voulait mettre 100 livres d'oxygène dans le canon. Après deux minutes environ, il y avait à peu près 60 livres d'oxygène de pression; et l'explosion est survenue.

Position des hommes:

de gauche à droite:

[REDACTED], [REDACTED], [REDACTED] et [REDACTED]; ce dernier([REDACTED]) s'est peut-être déplacé avant l'explosion.

Les choses ont été faites suivant la normale, comme d'habitude. J'étais au courant des règles de sécurité parce que j'avais opéré pendant presque deux ans. C'était la première fois qu'on mettait du gas dans le canon depuis ces deux minutes là.

APPENDIX "F"

MEMORANDUM

To: Mr. R. Pérusse S.O.

File:

From: J. Bergeron R.N.

Date: 13 August, 1959

Subject: W.C.C. 29 July, 59 [REDACTED]

No:

s.19(1)

Dr. I. Wilson, of Jeffery Hale Hospital, reported by phone on July, 30th on these following cases:

[REDACTED] & [REDACTED] had slivers of glass, imbedded in the skin of face, neck, upper part of thorax and upper arms. Dr. Wilson removed the greater part of these slivers from both patients, in the evening of July, 29th and the patients remained in hospital over night. The remaining slivers might need further attention.

[REDACTED] had just one piece of glass, removed from his left shoulder and was allowed to return home.

These details are submitted as per your request of August 12th for information.

J. Bergeron R.N.
for Miss H. Matte R.N.
I/C Health Center C.A.R.D.E.

PROVINCE OF QUEBEC

WORKMEN'S COMPENSATION ACT, 1931
REPORT OF FIRST AID ATTENDANT

If the injured workman had first aid treatment it is requested that this form be filled out in full by the attendant where medical aid is not given within two days of the accident and the period of disability is five days or more.
This report should be sent to the Commission with Form SS-1 (Report of accident and claim).

CLAIMANT'S name [redacted] (In block letters, please, beginning with family name)

s.19(1)

Address [redacted] P.Q.

EMPLOYER'S name Defence Research Board Ottawa Ont. (In block letters, please, beginning with family name)

1.—Give date of the accident.

29 July 1959

2.—Describe fully the physical condition resulting from the accident which causes disability.

Multiple skin abrasions and cuts, many small pieces of glass under skin over face. Maxillary sinus.

3.—When did you first treat the case ?

29 July 1959

3a—How many treatments were given, specify dates ?

one

4.—State your treatment.

(It is not sufficient to say "Usual", "Antiseptic" or "Dressing Applied", etc. State sufficient to indicate clearly the means taken to remedy the injury).

cleaning of wounds, dressings on larger cuts, disinfection

4a—Indicate date the injured workman was referred to a doctor.

5.—Is there any temporary partial or total incapacity in this case ?

yes
Total incapacity for at least one week.

Specify.

When did the incapacity terminate ?

If not terminated, state probable duration.

6.—Had he any previous physical defect ? (e.g., Hernia, Sight, Hearing, Limbs, Fingers, Spine).
If so, specify.

No

7.—Are you satisfied there is no misrepresentation, fraud, reticence, collusion or any other abuse in this case ?

yes

Made and signed at Valcartier Station this 30 day of July 1959

Hospital First Aid Attendant DR. C. BELAND

Name (In block letters, please)

[Signature]

Signature

PROVINCE OF QUEBEC

WORKMEN'S COMPENSATION ACT. 1931 REPORT OF FIRST AID ATTENDANT

If the injured workman had first aid treatment it is requested that this form be filled out in full by the attendant where medical aid is not given within two days of the accident and the period of disability is five days or more.
This report should be sent to the Commission with Form SS-1 (Report of accident and claim).

CLAIMANT'S name [redacted] (In block letters, please, beginning with family name)

s.19(1) Address [redacted] P.Q.

EMPLOYER'S name Defence Research Board Ottawa Ont. (In block letters, please, beginning with family name)

1.—Give date of the accident.	29 July 1959
2.—Describe fully the physical condition resulting from the accident which causes disability.	Multiple lacerations and skin cuts with foreign bodies under skin (left) on face. Therox and dress.
3.—When did you first treat the case ?	29 July 1959
3a—How many treatments were given, specify dates ?	one. 29 July 1959
4.—State your treatment. <small>(It is not sufficient to say "Usual", "Antiseptic" or "Dressing Applied", etc. State sufficient to indicate clearly the means taken to remedy the injury).</small>	cleaning of wounds, dressing cuts of skin
4a—Indicate date the injured workman was referred to a doctor.	Dressings on bleeding cuts transfer to Hospital
5.—Is there any temporary partial or total incapacity in this case ? Specify. When did the incapacity terminate ? If not terminated, state probable duration.	Yes Total incapacity - at least 1 week one week
6.—Had he any previous physical defect ? (e.g., Hernia, Sight, Hearing, Limbs, Fingers, Spine). If so, specify.	No
7.—Are you satisfied there is no misrepresentation, fraud, reticence, collusion or any other abuse in this case ?	Yes

Made and signed at Malcarville Station Hospital this 30 day of July 1959

First Aid Attendant DR C. BELAND
Name (in block letters, please)

[Signature]
Signature

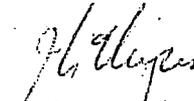
APPENDIX "G"

Analysis of Lubricating Grease on Valves and Gauges from Aerophysics

The grease from two valves (valve E which was shattered by the explosion and valve A which was in the same line but undamaged) was examined by infrared spectroscopy. Their absorption spectra showed that the grease was the same in both valves and was apparently an aliphatic hydrocarbon containing some unsaturated carbons. It was definitely not a silicone or fluorocarbon type grease.

A trace of grease was also visible in the Bourdon tube of the shattered gauge. This was removed with methylene chloride and examined. Infrared absorption showed that it was the same grease as found in valves E and A but the absorption due to unsaturation was now missing. Instead a new absorption was present indicating the presence of aldehydes or acids. It would appear therefore that the unsaturated groups were oxidized during the explosion.

A white luting material found on the brass connector leading to the gauge was proven to contain lead and was probably a white lead composition similar to that used by plumbers.


(J.L. Myers)

C.A.R.D.E.
3 August 1959

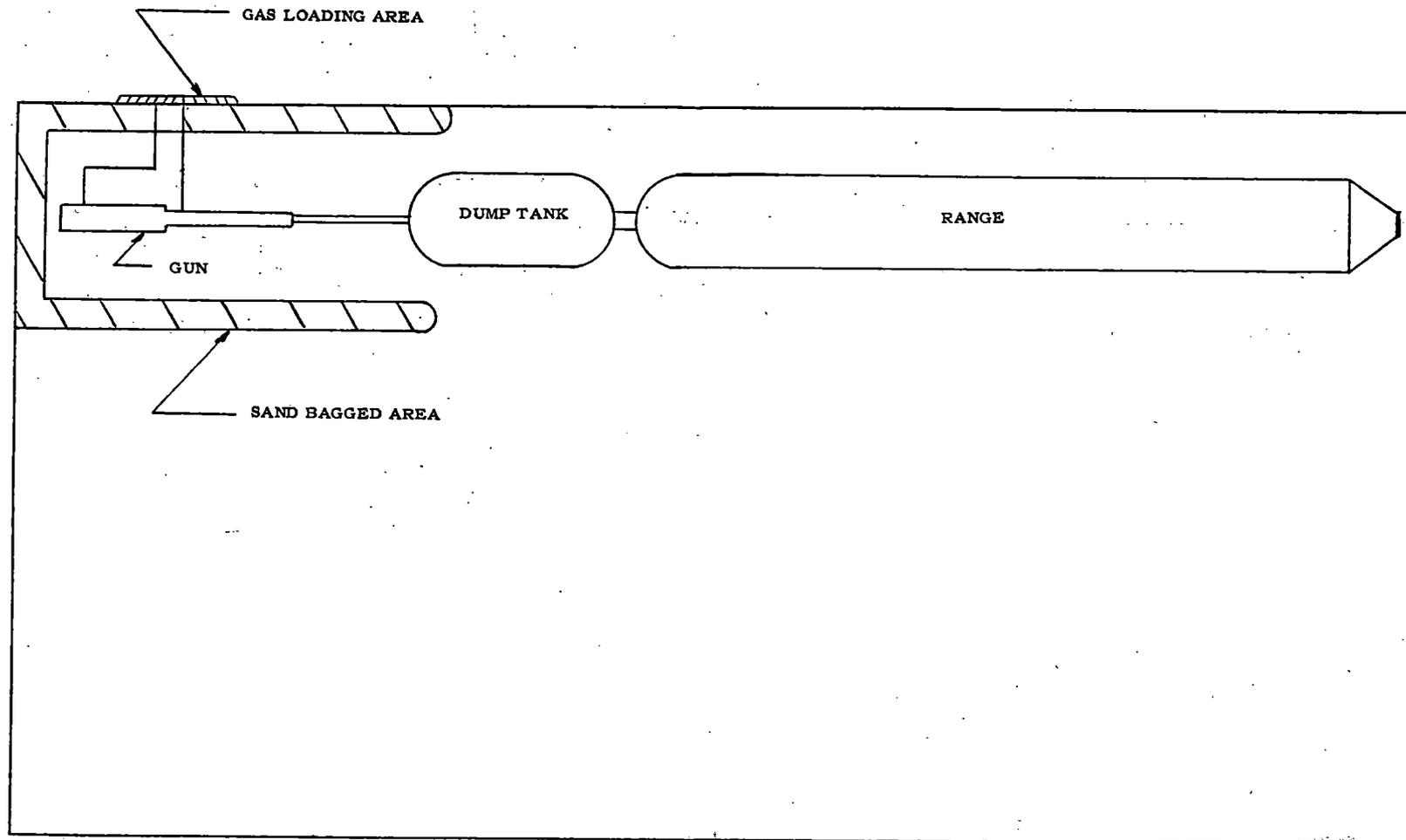


FIGURE 1

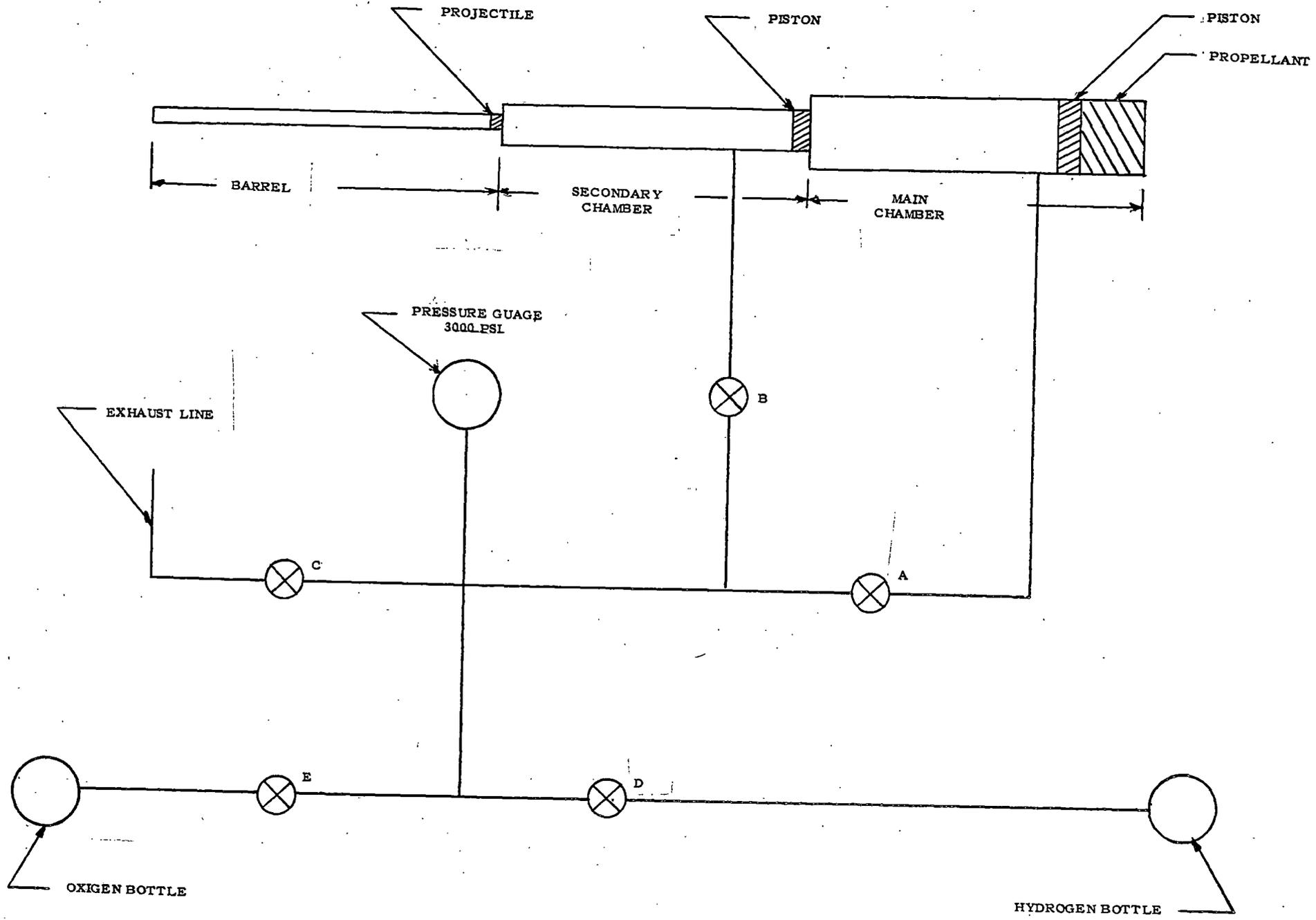


FIGURE 2

Report of the Board of Enquiry on the
Accident at Bldg 240 on Wednesday 29th July 1959

Introduction

On Thursday 30 July 1959 the Acting Chief Superintendent convened a Board of Enquiry to investigate an accident which occurred on Range 2 Bldg 240 on Wednesday 29th July 1959 at approximately 5.40 p.m. (See memo CS 128 dated 31 July 1959 as Appendix A). The Board consisted of R.F. Wilkinson (Chairman), Dr. G.V. Bull, H. Jones, R. Perusse and L.F. Smith (Secretary).

The Board examined the results of the accident and took evidence from the people concerned on 30 July and met on 31 July to approve a preliminary report which was passed to the Acting Chief Superintendent for forwarding to DRB Headquarters.

The Board met again on Tuesday 4 August and later approved the final report to be passed to the Acting Chief Superintendent.

In the report which follows, each of the points raised in the memo CS 178 are considered in turn and then conclusions and recommendations are enumerated.

(a) The Facts about the Accident

(i) Description of Range No. 2

Range No. 2 is located in and adjacent to Bldg 240 on the South Site of the Establishment. It consists of a hypervelocity gas gun, of 2 in. calibre, which is located entirely within Bldg 240, gas storage cylinders and control panel which are located outside the building adjacent to its north-east wall and gas supply lines which pass through the north-east wall of the building connecting the main and secondary chambers of the gas gun to the control panel.

It should be noted that at the time of the accident both the location of the control panel and the control panel installation were of a temporary nature. A permanent control panel is scheduled to be installed in an extension to the north-west end of Bldg 240, which was being constructed at the time the accident occurred.

Photograph 15130, taken after the accident, shows the hydrogen and oxygen supply cylinders together with the control panel and photograph 15131 shows the control panel. Fig. 1 shows the overall layout of the range and Fig. 2 is a schematic of the principal sections of the gas gun and the control valves for the gas supply lines.

With reference to Fig. 2, valves E and D control the flow of gas from the oxygen and hydrogen supply cylinders respectively, connecting the cylinders to the common supply line feeding the main and secondary chambers of the gas gun. Valves A and B control the flow of gas between the common supply line and the main and secondary chambers of the gun respectively. A pressure gauge, graduated from 0-3000 psi, is located on the common supply line and the valve C permits gas in the common line to be exhausted to the atmosphere.

-2-

(ii) Normal Loading Procedure

The normal loading procedure for the gun consists of three distinct phases. Phase 1 is the loading of the Heller propellant behind the piston in the main chamber of the gun. Phase 2 is a gas purging or flushing operation in which oxygen at 1000 psi is fed to the main chamber only of the gun and then exhausted to the atmosphere. This flushing operation is carried out twice before proceeding with Phase 3, the final charging of the gun. In Phase 2 valves B, C, and D are closed, valves A and E are opened until the pressure gauge reads 1000 psi and valve E is then closed. To exhaust the oxygen from the main chamber, valve C is now opened and left open until the gauge reads zero, whereupon valve C is closed and the cycle repeated. In Phase 3, valves B, C, and D are closed and valves A and E opened until the main chamber is loaded with oxygen to 100 psi, as indicated by the gauge. Valves A, C, and E are then closed and valves B and D opened until the secondary chamber is filled with hydrogen to 800 psi. The final operation in Phase 3 of the loading procedure is with valves B, C, and E closed to open valves A and D and load the main chamber with hydrogen to 1000 psi. Valves A and D are then closed and the gas gun is ready to fire.

(iii) Description of the Accident

s.19(1) The accident occurred at approximately 5.40 p.m., on Wednesday, 29 July 1959. Phase 1 of the loading operation had been completed and the first purging operation of Phase 2 had commenced at about 5.35 p.m. Standing left to right, facing the control panel, were [redacted], [redacted] and [redacted]. [redacted] and [redacted] were carrying out the loading procedure and [redacted] was present to supervise the operation. Normally, only one operator, [redacted], carries out Phase 2 of the loading procedure but on the day of the accident [redacted] was present for the purpose of being instructed by [redacted] on the proper loading procedure. As the purging operation commenced, [redacted], who was in charge of the spectrograph equipment inside Bldg 240, entered the loading area to obtain further clarification on the arrangements that would be made for him to open the shutters on his equipment. [redacted] stood next to [redacted]. Two or three minutes after the charging of the main gun chamber with oxygen had commenced, an explosion took place. The oxygen pressure in the chamber immediately before the explosion was approximately 60 psi, as indicated by the gauge. The explosion blew fragments of glass and metal into the area immediately in front of the control panel. [redacted] and [redacted] suffered injuries; [redacted] and [redacted] were unhurt. Coderre, when he realised that something had gone wrong, turned off the oxygen control valve C, threw himself on the ground and rolled away from the building; [redacted] turned away from the control panel and ran from the area. Immediately after the explosion, [redacted], [redacted], [redacted] and [redacted] went to the Guard House, where they reported the accident and had an ambulance called from the Valcartier Military Camp.

Copies of statements taken from the four people involved are reproduced as Appendices B to E of this report.

(b) Injuries to Personnel

The injuries suffered by [redacted] and [redacted] are described in the attached Appendix F.

.../3

-3-

(c) Damage to Equipment

The damage to the equipment as a result of the accident was restricted entirely to the control panel. The pressure gauge was shattered, the oxygen control valve E was badly damaged and the pipe connection joining control valve E to the common line was ruptured. The general extent of the damage can be seen in photographs 15130 and 15131.

As part of the enquiry a detailed examination was made of the control system. On dismantling it, abundant evidence was found of grease both within the valves and on many of the pressure seal joints. Samples of the greases were taken from valves A and E and also the fractured Bourdon tube from the gauge. A copy of the analytical report is reproduced as Appendix G. It is apparent that the grease was of the hydrocarbon type.

Photograph 15182 shows the fractured Bourdon tube from the gauge. It is apparent that it burst when subjected to a pressure considerably in excess of the rated 3000 psi. In addition to the grease within the tube the threads were heavily greased.

Photograph 15180 shows a section of the connections to the gauge and the Bourdon tube mount. All joints were greased and a considerable amount of metal removal and deposition was apparent except in the heavy brass connector.

All the connections between valve E and the gauge contained a deposit and many of the narrower channels had been enlarged by combustion or erosion.

Photograph 15181 shows a section of valve E with a similar section of the undamaged valve A for comparison. It is apparent that a considerable amount of metal was removed from valve E by combustion or erosion. The photograph also shows the damaged connection to valve E.

(d) Possible Causes of the Accident

It is considered that there is little doubt that the accident was caused initially by a reaction between oxygen and grease which was found throughout the system.

The exact sequence of events is not absolutely clear but it is considered that the following is the most likely. A small explosion occurred within valve E resulting in a general increase in pressure and the spreading of hot combustion products throughout the accessible part of the system. The hot gases and the associated turbulence probably caused other quantities of grease and oxygen to react in other parts of the system including the gauge. Further increase in pressure resulted and the Bourdon tube in the gauge failed. At about the same time, the connection to valve E failed and oxygen began to escape into the atmosphere. Since the valve was hot, considerable metal melting and combustion occurred resulting in the heavy deposits on exposed parts of the system. The deposits throughout the connection and valves were probably carried through the system at the time of the initial explosion.

(e) Were the CARDE Safety Regulations followed and are they adequate?

In this context "the CARDE Safety Regulations" are read to mean the regulations approved by the Chief Superintendent for the use of Hypersonic Test Facilities. The primary emphasis in these regulations has been on protection against failure of guns in firing.

.... /4

-4-

(e) (Cont'd)

No aspects of this accident have suggested that the regulations were inadequate in this respect.

The only regulation which is specially relevant to this accident is contained in para 1.2 of the regulations approved by the Chief Superintendent in CS 105 dated 7 Oct 1958 (CARDE file 9900-3) stating

"Adequate protection is to be provided for personnel and instrumentation against failure of pressure vessels and associated equipment."

This regulation was not observed adequately in the following respects:

(i) The high pressure system was not covered by a protective steel as for Range 1 and in accordance with general instructions of Supt. Aerophysics.

(ii) The gauge contained a glass window instead of a plastic blow-out window as recommended.

(iii) There was no thick protective plastic in front of the gauge.

It is considered that, at the present time, no comprehensive code of standard practice for the use of high pressure gas equipment is available within the Establishment. It is considered necessary that a code should be prepared and issued as part of the CARDE safety regulations for use by all the Wings.

It was noticed during the enquiries that the gas bottles were not fastened securely. This is in contravention of the recommendation made by Hypersonic Test Facilities Safety Committee and recorded in para 2.3.1(1) of the minutes dated 14 April 1958 (CARDE file 9900-3).

(f) Were Aerophysics Wing Safety Procedures consistent with DRB Regulations in relation to the hazards of the trial?

Except as pointed out in (e) above the procedures used were consistent with DRB regulations. It should however be stressed that it appears that the special hazards associated with oxygen gas under pressure have not, in the past, been adequately appreciated. The oxygen loading operation has not previously been regarded as a special trial hazard.

(g) Any other incidental factors which may have a bearing on the accident.

s.19(1)

It was noted that [redacted] had no need to be in the vicinity of the accident at the time, although it must be borne in mind that the operation in progress was not considered to be a hazardous one.

It was also noted that the two more seriously injured employees were both wearing glasses and that, although extensively cut about the face, they received no eye injuries. This experience represents strong support for use of safety glasses during the conduct of all laboratory-type operations.

Conclusions

(1) The accident was caused by the reaction of oxygen under pressure and grease which was present throughout the system.

...../5

-5-

Conclusions (Cont'd)

- s.19(1)
- (2) The CARDE Safety Regulations were violated in that the high pressure equipment was not adequately protected and an unsatisfactory gauge was used. These violations were not in fact the cause of the accident but contributed significantly to the injuries sustained. The responsibility for this violation must rest with the Group Leader [REDACTED].
- (3) It is probable that the special hazards associated with the use of oxygen under pressure have not been adequately appreciated in the past.
- (4) Apart from (2) and (3) above the general procedures for the use of Hypersonic Test Facilities were adequately followed.
- (5) After the accident the staff behaved correctly and the ambulance arrived promptly from Camp Valcartier.
- (6) The injuries sustained were not serious although if [REDACTED] and [REDACTED] had not been wearing glasses they could have sustained serious eye injuries.

Recommendations

1. All high pressure equipment for handling oxygen should be degreased before further firings are undertaken.
2. Since apparently each Aerophysics Wing Group Leader is responsible for high pressure gas handling equipment, it is recommended that a committee be set up to write a manual of safe practices for handling systems containing gases under pressure. The committee should consist of I.R. Cameron from Explosives Wing (Chairman), G. Kirouac from Workshops, Technical Services and each of the Aerophysics Wing Group Leaders concerned.
3. The manual of safe practices should be approved by the CARDE Safety Committee and promulgated for use throughout the Establishment.

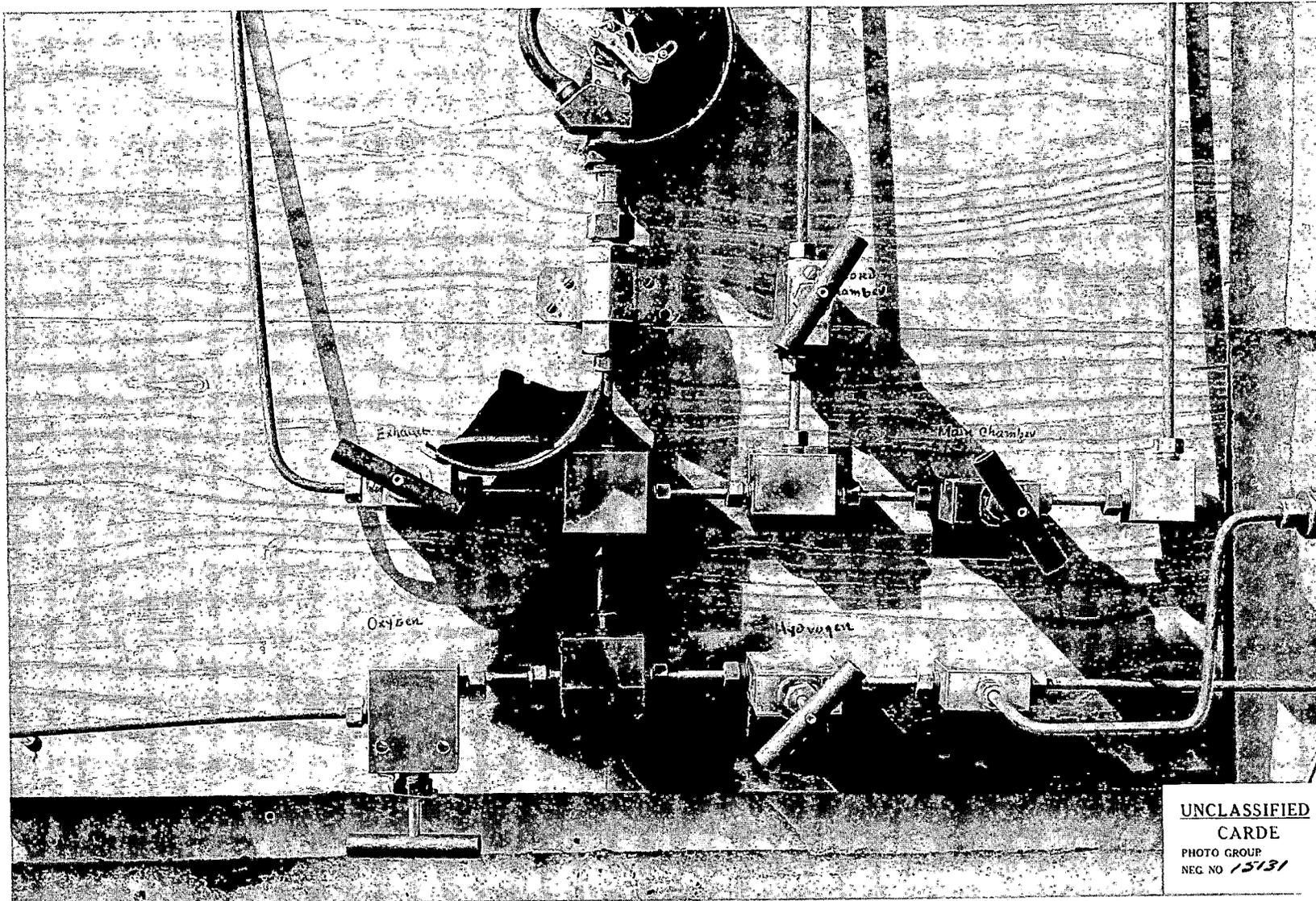
Approved:

R.F. Wilkinson
Dr. G.V. Bull
H. Jones
R. Pérusse
L.F. Smith

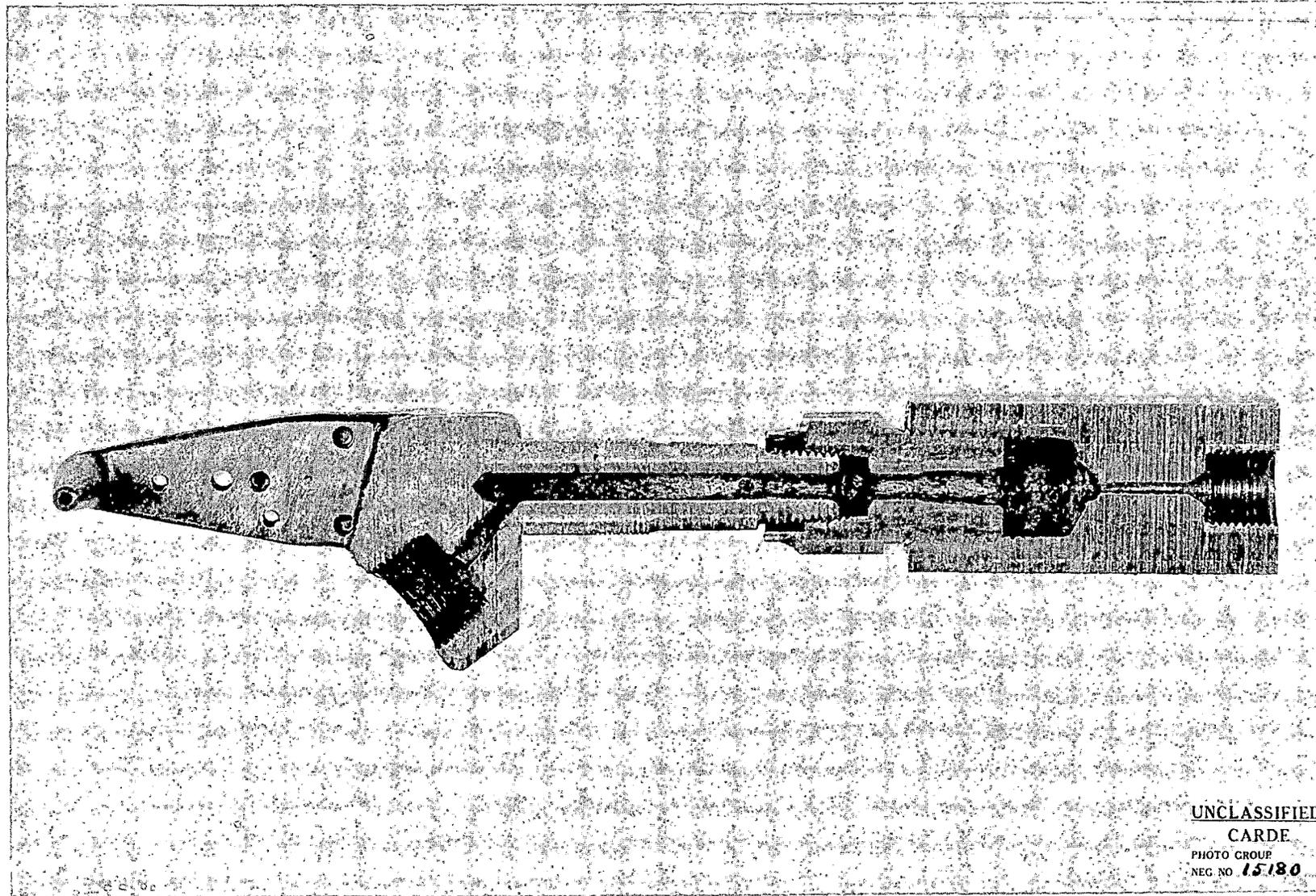
21 August, 1959

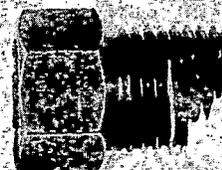
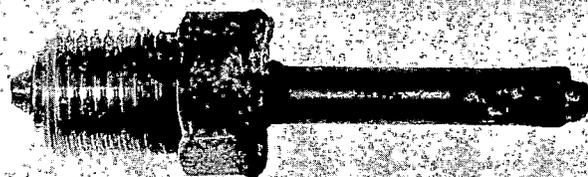
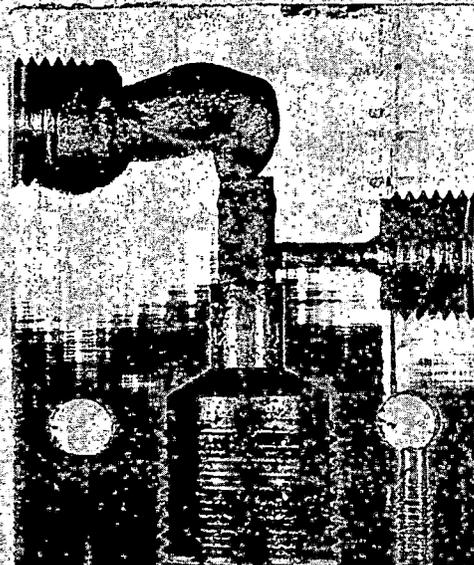
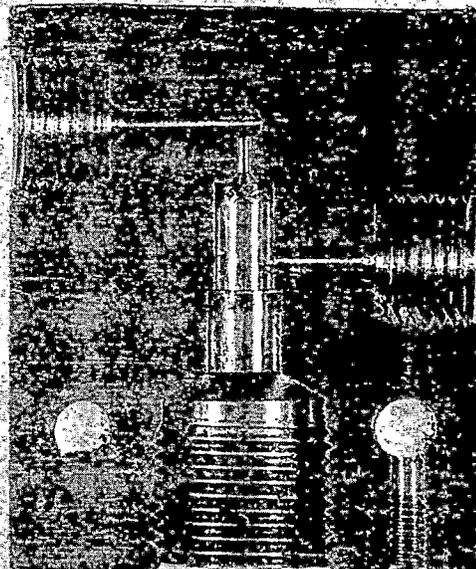


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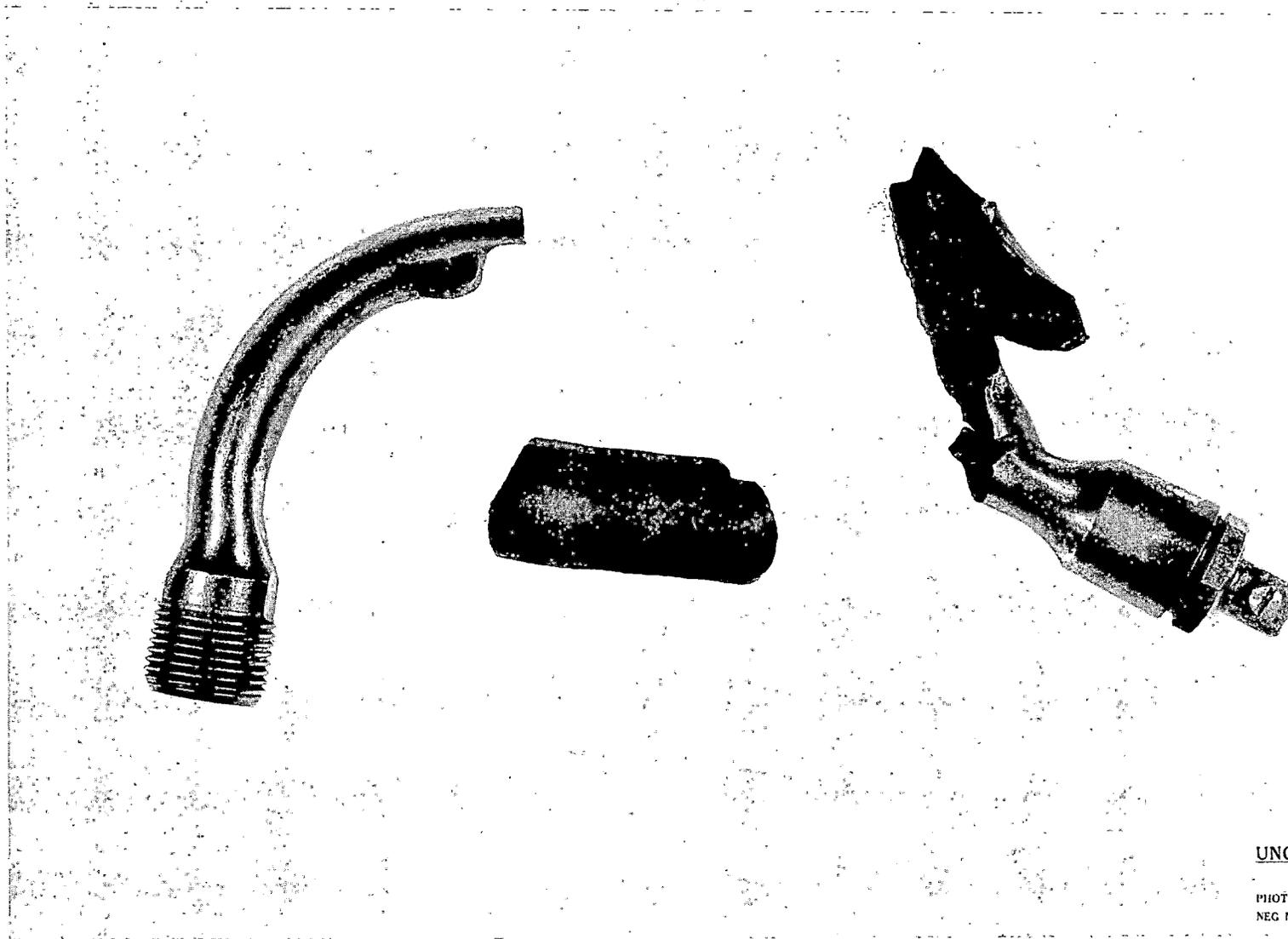


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CARDE
PHOTO GROUP -
NEG NO. /5782

APPENDIX "A"

MEMORANDUM

To: Distribution File: CARDEC 105-1
From: Acting Chief Superintendent, Date: 31 July, 1959.
C.A.R.D.E.
Subj.: Board of Enquiry No.: CS-128
Range No. 2 Gun Accident - 29-7-59

s.19(1) At 1800 hours, 29 July, 1959, an explosion occurred in Aerophysics Wing while No. 2 Range gun was being charged with oxygen. Two staff members [redacted] and [redacted] received injuries and are hospitalized.

I hereby appoint a Board of Enquiry with the following membership to investigate this accident:

R.F. Wilkinson - Chairman
G.V. Bull
H. Jones
R. Perusse
L.F. Smith - Secretary

The Board should report on the following factors:

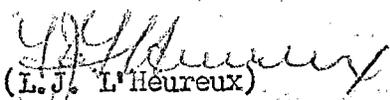
- (a) The facts about the accident.
- (b) Injuries to personnel. (Medical report to be included.)
- (c) Damage to equipment.
- (d) Possible causes of the accident.
- (e) Were CARDE safety regulations followed and are they adequate?
- (f) Were Aerophysics Wing safety procedures consistent with DRB regulations in relation to the hazards of the trial?
- (g) Any other incidental factors which may have a bearing on the accident.
- (h) The Board of Enquiry recommendations.

I wish an interim report by 1200 hours, 31 July, 1959, and a complete report of the Board of Enquiry's findings as soon as all the facts have been established.

Distribution

R.F. Wilkinson
G.V. Bull
H. Jones
R. Perusse
F. Smith

c.c. DRB - Ottawa


(L.J. L'Heureux)
Acting Chief Superintendent

APPENDIX "B"

REPORT OF ACCIDENT AT BLDG. 240 ON JULY 27, AT 5:40 P.M.

1- Personnel involved

Professionals: Messrs [REDACTED] s.19(1)
Technicians : " " [REDACTED]

2- Gas loading gun

A diagrammatic representation of the gun plus gas loading system is presented in Fig. 1. The usual gas loading system is as follows. Valves B, C and D are closed and the main chamber is filled to 1,000 psi. Valve E is then closed, valve C opened and the oxygen is exhausted to the atmosphere. This flushing operation is then repeated. Again valves B, C and D are closed and the main chamber is loaded to 100 psi with oxygen. Valves A, C and E are then closed, valves B and D opened and the secondary chamber filled to 800 psi. with hydrogen. The last loading operation is then to close valve B, open valve A and load the main chamber with hydrogen to 1,000 psi.

3- Sequence of events on July 27th.

The propellant had been loaded in the gun. [REDACTED], [REDACTED] and [REDACTED] went outside of the building to the gas loading area. (see Fig 2). [REDACTED] and [REDACTED] were to load the gun, Maiden to supervise. The first oxygen filling of the main chamber commenced at about 5:35 P.M. Standing left to right in front of the loading area were [REDACTED], [REDACTED] and [REDACTED]. Valves B, C and D were closed, valves A and E open and the main chamber commenced to fill with oxygen. At this stage of the operation, [REDACTED] entered the loading area to presumably ask some question on firing time as he was operating a spectograph on the range. He stood next to [REDACTED].

The explosion occurred almost immediately - some 2 to 3 minutes after loading had commenced, at this time the oxygen pressure in the main chamber was approximately 60 psi. The explosion blew fragments of glass and molten metal about and [REDACTED] and [REDACTED] suffered injuries. The glass was from the pressure gauge and the metal from a section of the pipe next to valve C. The accident was immediately reported to the guard who called an ambulance from the Valcartier Camp Hospital. The two injured men were then taken first to the Camp Hospital and then to the Jeffery Hale.

[REDACTED]

[REDACTED]

APPENDIX "C"

30 July 1959

My part in the accident at Range 2 on July 29, 1959.

s.19(1)

Several minutes before the accident occurred, I had asked [REDACTED] what arrangements would be made for me to open the shutters on the two spectrographs I had installed on Range 2 and to get to safety before the gun was fired.

He suggested that we speak with [REDACTED]. We left building 240 together and walked around the end of the building to where [REDACTED] and [REDACTED] were working near the gas bottles used to fill the two inch gun.

When we arrived [REDACTED] was adjusting a valve so that the gauge would read a very high pressure and then a very low one. [REDACTED] and [REDACTED] spoke. I went closer to the gauge so that I could have a better view and watch more closely the movement of the pressure indicating needle of the gauge. [REDACTED] was just bringing up my problem when the explosion occurred. The time between our arrival at the gauge and the explosion was easily less than a minute. I was probably about two feet from the gauge.

After the explosion I turned and ran directly away from building 240 for three or four hundred feet. I then turned to see what was happening. I saw Dr. Maiden with [REDACTED]. I heard someone shout something about the guard house. I ran around the front of building 240 to the guard house.

This is my statement of what happened to me at building 240.

[REDACTED]

[REDACTED]

[REDACTED]

APPENDIX "D"

STATEMENT

BY

[REDACTED]

s.19(1)

After the gun had been loaded with four pounds of propellant in the primary chamber, I went out of the building to the gage loading pannel with [REDACTED] and explained to him how the loading should be done, as he was to be in charge of loading from then on. I explained to him that the first procedure was to check that all cylinders' valves were closed, that the Aminco valve between the panel and the cylinders was also closed. The second step was to check that all the chambers were closed. The third step was to check that the exhaust valve was open. The fourth step was to close the exhaust valve and to open primary chamber valve according to whichever chamber we wanted to load first. In this case, the primary chamber was to be loaded first to a pressure of 100 pounds oxygen. Consequently, the primary chamber valve was opened. The oxygen bottle valve was then opened. Finally, the Aminco valve which sits between the panel and the cylinder was opened to let the oxygen into the primary chamber. When this pressure reached 60 psi, the pressure gage got lit over all a medium blue color flying at 45° angle outward from the meter. Then, I realised an explosion had occured. I closed the oxygen valve and rolled on the ground to about 50 feet away from the bottles, and then checked that nobody was seriously injured. I went to the guard room to report the accident.

[REDACTED]

APPENDIX "E"

RAPPORT

DE

[REDACTED]

s.19(1)

Comme d'habitude, on avait placé les diaphragmes et les pistons et le projectile dans le canon. Le canon était fermé, prêt à mettre le gas. [REDACTED] et [REDACTED] sommes allés charger une chambre du canon avec de l'oxygène. [REDACTED] voulait mettre 100 livres d'oxygène dans le canon. Après deux minutes environ, il y avait à peu près 60 livres d'oxygène de pression; et l'explosion est survenue.

Position des hommes:

de gauche à droite:

[REDACTED], [REDACTED], [REDACTED] et [REDACTED]; ce dernier([REDACTED]) s'est peut-être déplacé avant l'explosion.

Les choses ont été faites suivant la normale, comme d'habitude. J'étais au courant des règles de sécurité parce que j'avais opéré pendant presque deux ans. C'était la première fois qu'on mettait du gas dans le canon depuis ces deux minutes là.

[REDACTED]

APPENDIX "F"

MEMORANDUM

To: Mr. R. Pérusse S.O.

File:

From: J. Bergeron R.N.

Date: 13 August, 1959

Subject: W.C.C. 29 July, 59 [REDACTED]

No:

s.19(1)

Dr. I. Wilson, of Jeffery Hale Hospital, reported by phone on July, 30th on these following cases:

[REDACTED] & [REDACTED] had slivers of glass, imbedded in the skin of face, neck, upper part of thorax and upper arms. Dr. Wilson removed the greater part of these slivers from both patients, in the evening of July, 29th and the patients remained in hospital over night. The remaining slivers might need further attention.

[REDACTED] had just one piece of glass, removed from his left shoulder and was allowed to return home.

These details are submitted as per your request of August 12th for information.

Jeune Bergeron R.N.
for Miss H. Matte R.N.
I/C Health Center C.A.R.D.E.

PROVINCE OF QUEBEC

WORKMEN'S COMPENSATION ACT. 1931
REPORT OF FIRST AID ATTENDANT

If the injured workman had first aid treatment it is requested that this form be filled out in full by the attendant where medical aid is not given within two days of the accident and the period of disability is five days or more.
This report should be sent to the Commission with Form SS-1 (Report of accident and claim).

CLAIMANT'S name [redacted] (In block letters, please, beginning with family name) s.19(1)

Address [redacted] P.Q.

EMPLOYER'S name Defence Research Board Ottawa Ont. (In block letters, please, beginning with family name)

1.—Give date of the accident.

29 July 1959

2.—Describe fully the physical condition resulting from the accident which causes disability.

Multiple skin abrasions and cuts, many small pieces of glass under skin over face. Maxillary and mandibular.

3.—When did you first treat the case ?

29 July 1959

3a.—How many treatments were given, specify dates ?

one

4.—State your treatment.

(It is not sufficient to say "Usual", "Antiseptic" or "Dressing Applied", etc. State sufficient to indicate clearly the means taken to remedy the injury).

cleaning of wounds, dressings on larger cuts, disinfection

4a.—Indicate date the injured workman was referred to a doctor.

5.—Is there any temporary partial or total incapacity in this case ?

Specify.

When did the incapacity terminate ?

If not terminated, state probable duration.

yes
total incapacity for at least one week

6.—Had he any previous physical defect ? (e.g., Hernia, Sight, Hearing, Limbs, Fingers, Spine). If so, specify.

no

7.—Are you satisfied there is no misrepresentation, fraud, reticence, collusion or any other abuse in this case ?

yes

Made and signed at Valcartier Station this 30 day of July 1959

Hospital First Aid Attendant

DR C. TSEKAND

Name (in block letters, please)

[Signature]

Signature

PROVINCE OF QUEBEC

WORKMEN'S COMPENSATION ACT. 1931 REPORT OF FIRST AID ATTENDANT

If the injured workman had first aid treatment it is requested that this form be filled out in full by the attendant where medical aid is not given within two days of the accident and the period of disability is five days or more.
This report should be sent to the Commission with Form SS-1 (Report of accident and claim).

CLAIMANT'S name [redacted] (In block letters, please, beginning with family name)

s.19(1)

Address [redacted] P.Q.

EMPLOYER'S name Defence Research Board Ottawa Ont. (In block letters, please, beginning with family name)

1.—Give date of the accident.

29 July 1959

2.—Describe fully the physical condition resulting from the accident which causes disability.

Multiple lacerations and skin cuts with foreign bodies under skin of leg on face, thorax and chest.

3.—When did you first treat the case?

29 July 1959

3a.—How many treatments were given, specify dates?

one 29 July 15

4.—State your treatment.

(It is not sufficient to say "Usual", "Antiseptic" or "Dressing Applied", etc. State sufficient to indicate clearly the means taken to remedy the injury).

cleaning of wounds, debridement of skin, dressings on bleeding cuts, transfer to Hospital

4a.—Indicate date the injured workman was referred to a doctor.

5.—Is there any temporary partial or total incapacity in this case?

Yes
Total incapacity - at least 1 week

Specify.

When did the incapacity terminate?

If not terminated, state probable duration.

one week

6.—Had he any previous physical defect? (e.g., Hernia, Sight, Hearing, Limbs, Fingers, Spine).
If so, specify.

No

7.—Are you satisfied there is no misrepresentation, fraud, reticence, collusion or any other abuse in this case?

No

Made and signed at Malcarville Station Hospital this 30 day of July 1959

First Aid Attendant DR C BELAND

Name (in block letters, please)

[Signature]
Signature

APPENDIX "G"

Analysis of Lubricating Grease on Valves and Gauges from Aerophysics

The grease from two valves (valve E which was shattered by the explosion and valve A which was in the same line but undamaged) was examined by infrared spectroscopy. Their absorption spectra showed that the grease was the same in both valves and was apparently an aliphatic hydrocarbon containing some unsaturated carbons. It was definitely not a silicone or fluorocarbon type grease.

A trace of grease was also visible in the Bourdon tube of the shattered gauge. This was removed with methylene chloride and examined. Infrared absorption showed that it was the same grease as found in valves E and A but the absorption due to unsaturation was now missing. Instead a new absorption was present indicating the presence of aldehydes or acids. It would appear therefore that the unsaturated groups were oxidized during the explosion.

A white luting material found on the brass connector leading to the gauge was proven to contain lead and was probably a white lead composition similar to that used by plumbers.

J.L. Myers
(J.L. Myers)

C.A.R.D.E.
3 August 1959

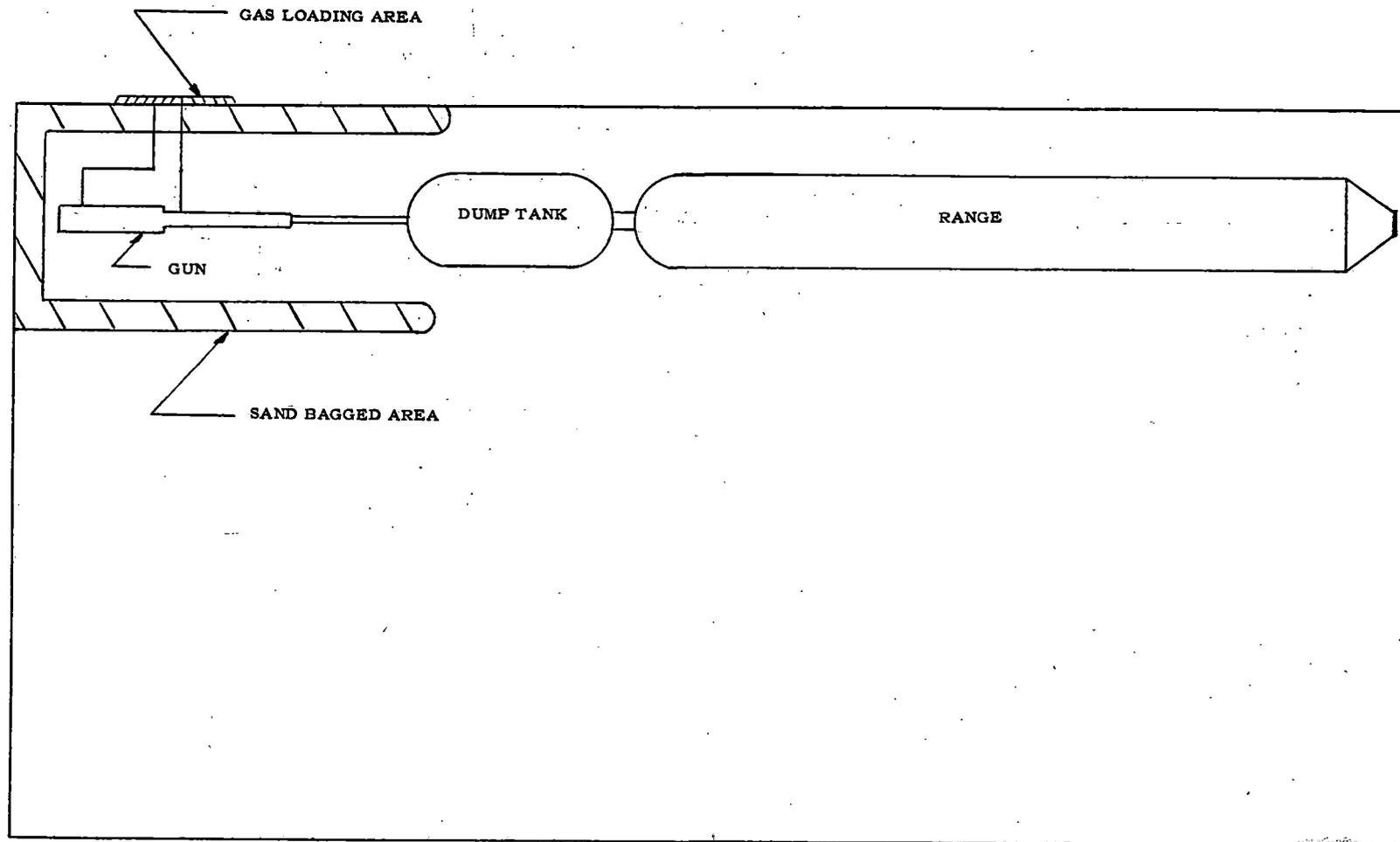


FIGURE 1

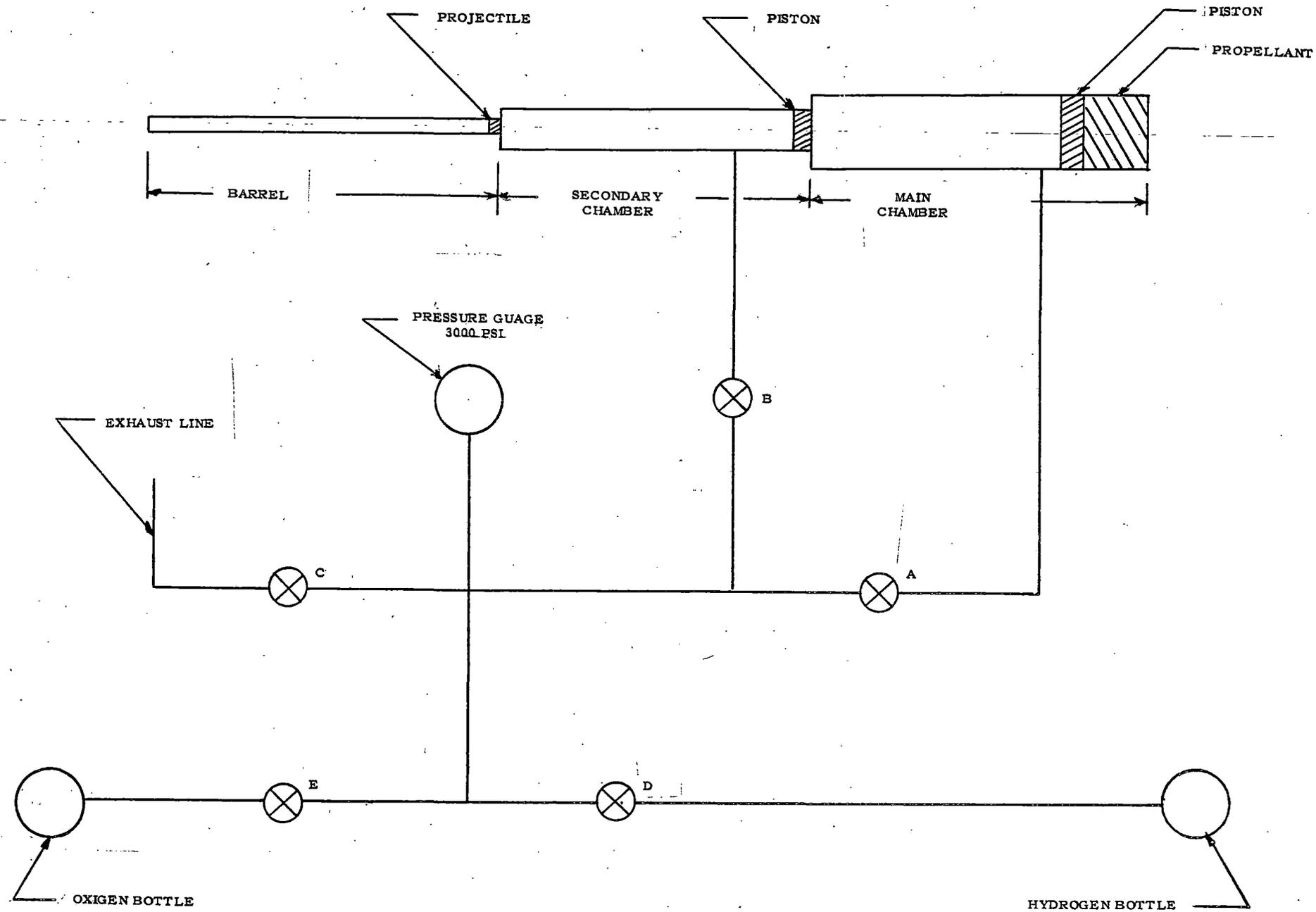


FIGURE 2

DRB 105-15/0

Ottawa, Ontario,
August 28, 1959.

Chief Supt.,
C.A.R.D.E.

Board of Enquiry
Range No. 2 Gun Accident 29-7-59

1. Receipt is acknowledged of your preliminary report on the accident at Building No. 240 on 29 July 1959.
2. May I be advised please, when the final report will be forwarded.

Original Signed by
C. A. WINSEP

CAW:ld

Chairman, Defence Research Board.

AR 105-15/0



310457

JUL 31 21 49 '59

NNNN

JUL 31 21 56 259

(Sumo)

(2)

COP To note

(2) D B

*seen by
Cap E*

AM164QQM064RQ015

RR RAEPT

DE RAEMQR 14/31

R 312040Z

FM CHIEF SUPT CARDE VALCARTIER PQ

TO DRB OTT

BT

CARDE 1298



0022176

5.19(1)

FURTHER TO CARDE 1288 DATED 30 JULY 1959 [REDACTED] AND [REDACTED] HAVE BEEN DISCHARGED FROM HOSPITAL AFTER REMOVAL OF MOST OF THE GLASS FRAGMENTS STOP SOME MINOR FRAGMENTS REMAIN TO BE REMOVED STOP PRELIMINARY REPORT OF ACCIDENT BEING MAILED THIS DATE STOP

BT

CFN 1298 1288 30/1959

31/2054Z JUL RAEMQR

(1)

*write
to
return to
[unclear]
[unclear]*

DCS [Signature]

*noted
HMB*

H.M.B.
C of E

AUG 5 1959

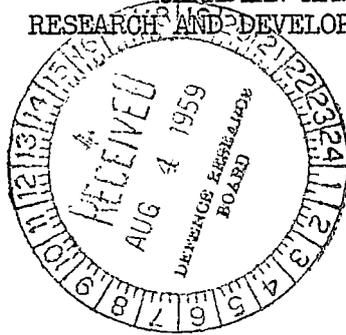
000464

IN REPLY PLEASE QUOTE
CARDEC 105-1

DEFENCE RESEARCH BOARD
CANADIAN ARMAMENT
RESEARCH AND DEVELOPMENT ESTABLISHMENT



DEPARTMENT OF NATIONAL DEFENCE
CANADA



P.O. Box 1427,
Quebec, P.Q.

31 July, 1959.

Chairman,
Defence Research Board,
Ottawa, Ont.

Board of Enquiry
Range No. 2 Gun Accident - 29-7-59

Referred to.....
AUG 4 1959
File No. <i>DRB 105-15/0</i>
Chgd to.....

1. Further to CARDE 1298 dated 31 July, 1959, attached please find Preliminary Report on Accident at Bldg. No. 240 on Wednesday, 29 July, 1959, by Board of Enquiry. Recommendations of Board are being implemented this date. Final report on the accident will be forwarded as soon as available.

BF Aug 27/59

L. J. L'Heureux
(L. J. L'Heureux)
Acting Chief Superintendent

Encl.

Preliminary Report on Accident at Bldg #240 on

Wednesday 27th July 1959

Board of Enquiry

On Thursday 28th July the Acting Chief Superintendent convened a Board of Enquiry to investigate an accident which occurred at Bldg #240 on Wednesday 27th July 1959 at approximately 5.40 p.m. The Board was constituted as follows:

R.F. Wilkinson - Chairman
Dr. G.V. Bull
H. Jones
R. Perusse
L.F. Smith - Secretary

General Circumstances of Accident

s.19(1) The accident occurred during the operation of Aerophysics Range 2 located in Bldg #240. This range consists of a 2 in. calibre gas gun. During modifications to the structure of the building, the gas controls for the gun were temporarily located on a wooden panel attached to the external wall of the building. The gun had been prepared for firing, loaded with projectile and propellant and the range cleared of personnel. The Group Leader [REDACTED] was in charge of the firing and the operations were being performed by a technician [REDACTED] who was instructing another technician [REDACTED], in the method of operation. Another scientist [REDACTED], concerned with instrumentation was also in the area.

The gas handling system had been assembled about two weeks previously and was said to be essentially similar to that used in Range 1 with the exception that the high pressure gas fittings were not mounted behind steel plate. The system had been successfully operated and the gun fired on the previous Friday. The general layout is shown diagrammatically in the Appendix.

At the commencement of operations [REDACTED], [REDACTED] and [REDACTED] were standing in front of the Control Panel and the main chamber was being loaded with oxygen to a pressure of 100 psi. During the operation [REDACTED] entered the area to ask [REDACTED] a question. The oxygen cylinder valve was said to be partially open and valves B, C and D were closed. Valves A and E were open and the pressure as shown by the gauge was about 60 psi after about two minutes. At this stage there was a sudden explosion of the gauge which blew out the glass front and shattered the metal casing. The Bourdon tube inside the gauge was seriously shattered. In addition the pressure tubing joint to valve E on the side remote from the oxygen cylinder had failed with evidence of extensive metal melting within the valve and at the seal. Metal melting was evident on the exterior of valve D and the wooden panel was slightly charred in the area.

When the explosion occurred [REDACTED] attempted to turn off valve E and all four people withdrew rapidly from the area. [REDACTED] and [REDACTED] suffered considerable superficial injuries to the face, arms and chest from flying fragments of glass and metal. Both were wearing glasses and suffered no damage to the eyes. [REDACTED] suffered no injury apart from very minor cuts from fragments and [REDACTED] was uninjured. All four went to the Guard

House where the duty guard summoned the ambulance from Camp Valcartier. The two injured men were taken to the Jeffery Hale hospital. [REDACTED] was released on the morning of the 28th and [REDACTED] later in the day after surgery to remove fragments from the throat. It is not considered that either man was seriously injured.

Method of Enquiry

Immediately on convening, the Board went to the scene of the accident and inspected the gas handling system. A photographer had already been on the scene and taken photographs of the system which are attached. Since the gun was still loaded with propellant it was agreed that the gun line should be disconnected and the gun purged with nitrogen before unloading. It was ascertained that the propellant in the gun had not burned.

[REDACTED] was instructed to remove the damaged valve from the panel and also an undamaged valve. These were taken to the Workshops by Mr. H. Jones and sectioned for closer study.

During the morning the Board took evidence from [REDACTED] and [REDACTED]. In the afternoon evidence was taken from [REDACTED] and [REDACTED] and also from Mr. G. Tidy who has been associated with various safety aspects of the Aerophysics facilities.

Medical certificates were obtained from the Camp Valcartier director who accompanied the ambulance.

On the morning of 31st July the sectioned gauges were examined more critically and evidence of grease was found on the threads of the valve key seal. Chemical tests showed it to be hydrocarbon grease. Examination of the gauge showed signs of grease inside the Bourdon tube and considerable quantities on all the connecting threads. There was severe metal burning on the entry tube to the gauge.

General Conclusions

1. The accident was confined entirely to the oxygen handling equipment and did not involve the gun within the building.
2. The evidence taken was remarkably self-consistent and suggested that all operations were proceeding normally up to the time of the accident.
3. The general operating instructions for the building were not violated.
4. The system was of a temporary nature and was not considered to incorporate all desirable safety features. Absence of these features can not apparently have led to the accident but could have minimized the consequences.
5. The exact sequence of events has not as yet been ascertained and it is not yet possible to state whether the initial failure was at the gauge or the valve.
6. It seems probable that the accident was caused by the presence of grease in the oxygen handling system, contrary to accepted practice.
7. After the accident the staff involved behaved correctly and the ambulance arrived promptly from Camp Valcartier.
8. The injuries sustained were not serious.

- 3 -

Recommendations

1. All high pressure equipment for handling oxygen should be degreased before further firings are undertaken. It should be noted that no grease of any kind (including silicones) should be used.
2. Since apparently each Aerophysics Wing Group Leader is responsible for high pressure gas handling equipment, it is recommended that a committee be set up to write a manual of safe practices for handling systems containing gases under pressure. The committee should consist of I.R. Cameron from Explosives Wing (Chairman), G. Kirouac from Workshops, Technical Services and each of the Aerophysics Wing Group Leaders concerned.
3. Steps should be taken to minimize the number of people in the vicinity of high pressure equipment during loading.
4. Safety glasses should be worn during loading operations.

R. W. Thurman

3/2/59.

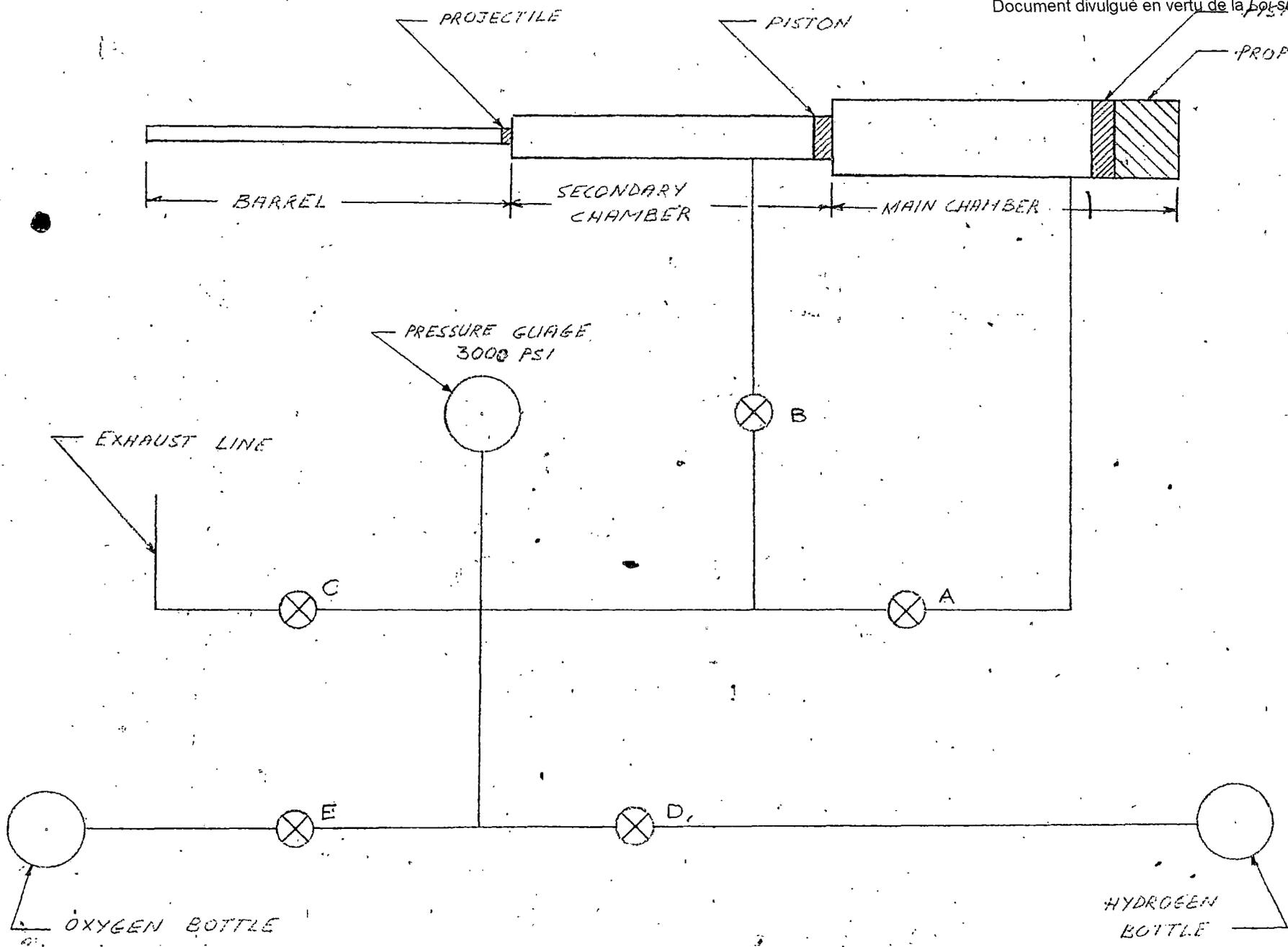


Fig. 1

TRANSMITTAL SLIP

DATE

6/8

TO:



(1)

~~10/15 7/8/59~~

FROM:

PAICORP

- | | |
|---|--|
| <input type="checkbox"/> Note and File | <input type="checkbox"/> Take Appropriate Action |
| <input type="checkbox"/> Note and Return | <input type="checkbox"/> As Requested |
| <input type="checkbox"/> Please Speak | <input type="checkbox"/> For Information |
| <input type="checkbox"/> Please Answer | <input type="checkbox"/> For Your Comments |
| <input type="checkbox"/> For Your Approval | <input type="checkbox"/> For Signature |
| <input type="checkbox"/> Prepare Reply For My Signature | |

COMMENTS:

(2) Props
 These acknowledge letters
 and ask for final report.
 No further action required.
 26/59
 [Signature]

CAFA 132
HQ 4554-A1327

000470

TRANSMITTAL SLIP

DATE

5/18/59

TO:

FROM:

 Note and File Note and Return Please Speak Please Answer For Your Approval Take Appropriate Action As Requested For Information For Your Comments For Signature Prepare Reply For My Signature

COMMENTS:

Minute 2, pls.

CAFA T327

HQ-4554-A1327

000471

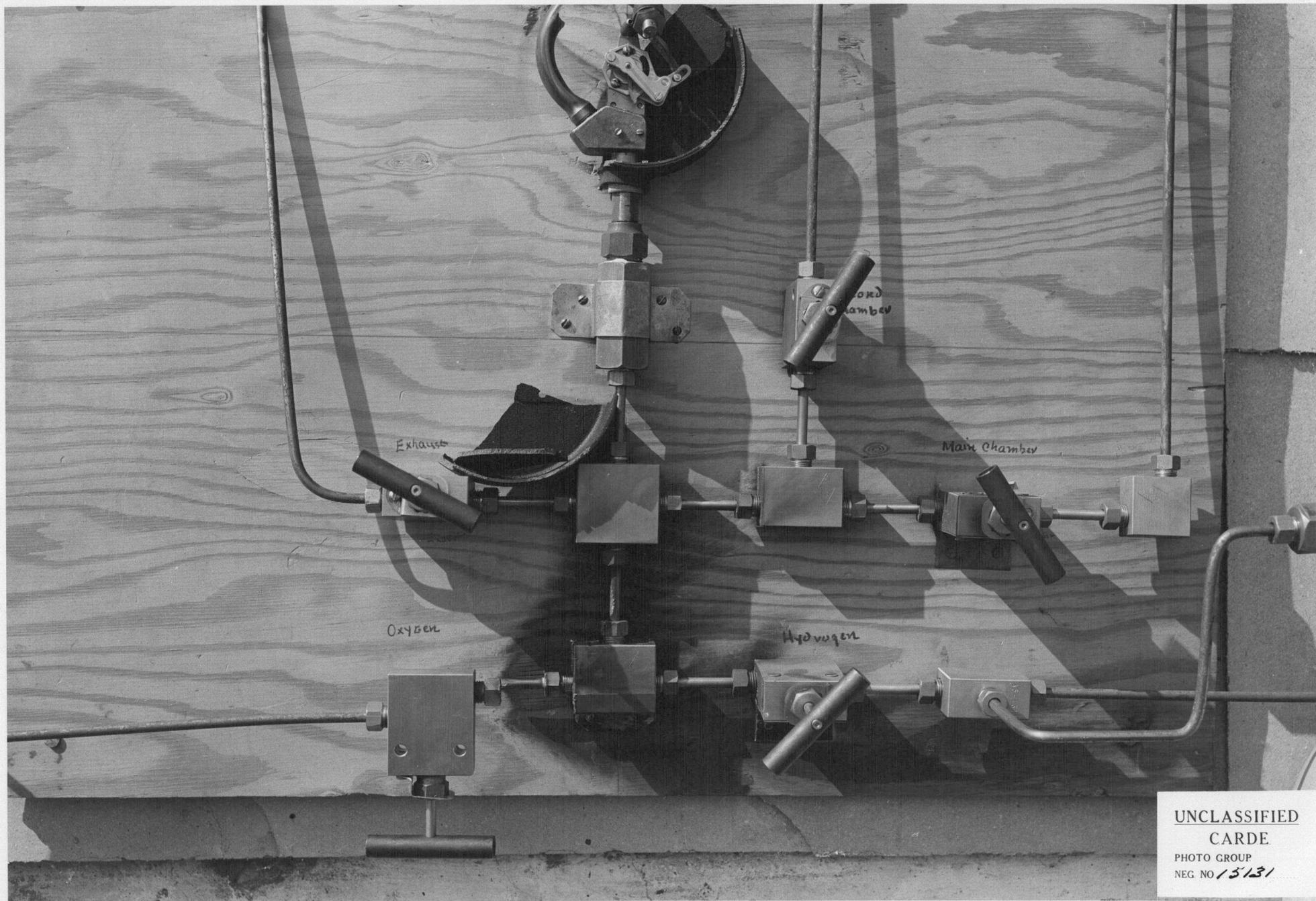
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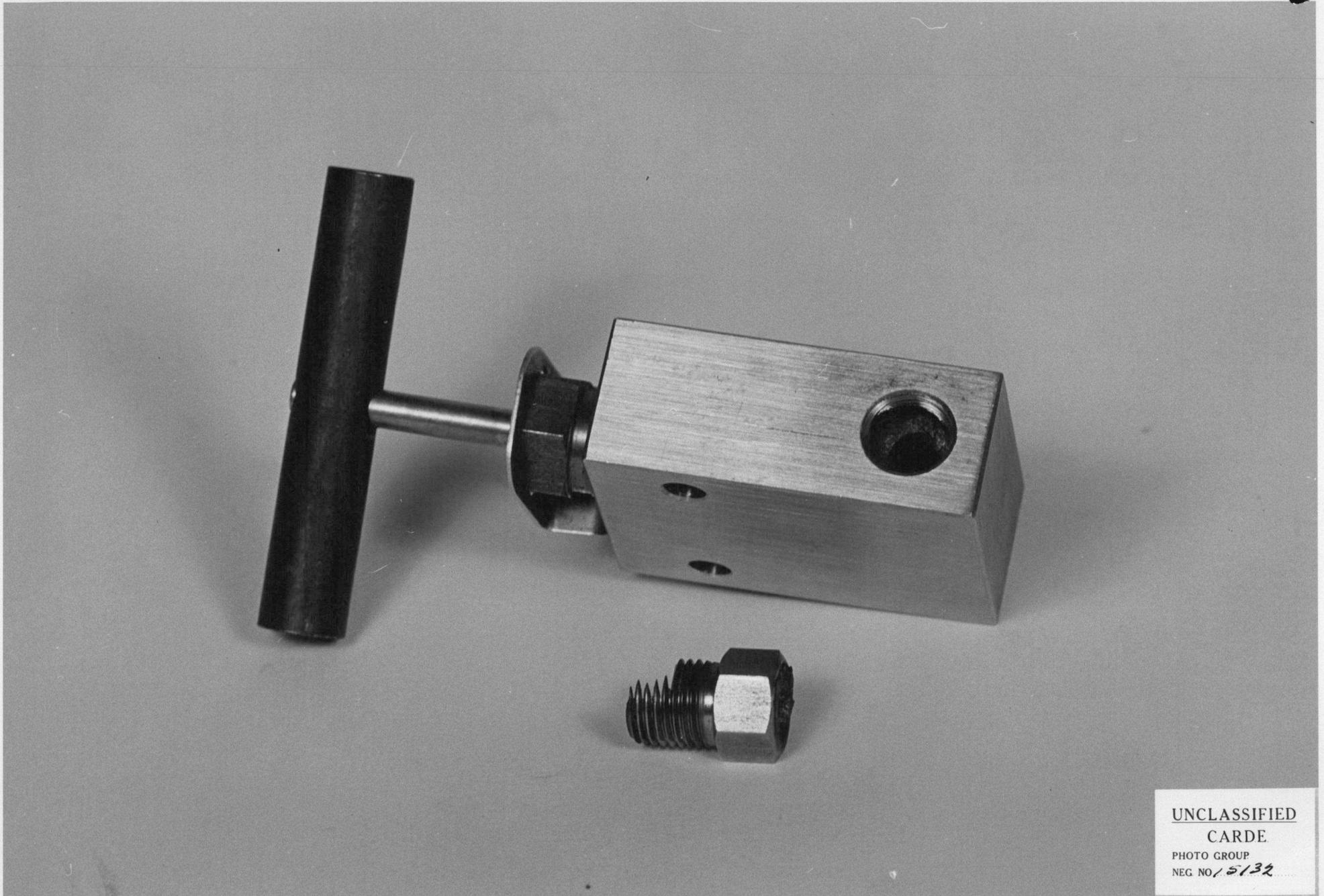
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UNCLASSIFIED
CARDE
PHOTO GROUP
NEG NO 15130



UNCLASSIFIED
CARDE
PHOTO GROUP
NEG NO 15131



UNCLASSIFIED

CARDE

PHOTO GROUP

NEG NO. 5132



MEMORANDUM

Referred to *AGS*
AUG 4 1959
File No. *PRC 105-15/0*
Chgd to *948 4-8*
File: CARDEC 105-1

To: Distribution Board
From: Acting Chief Superintendent,
C.S.A.

Date: 31 July, 1959.

Subj.: Board of Enquiry
Range No. 2 Gun Accident - 29-7-59

No.: CS-128

At 1800 hours, 29 July, 1959, an explosion occurred in Aerophysics Wing while No. 2 Range gun was being charged with oxygen. Two staff members and received injuries and are hospitalized.

s.19(1)

I hereby appoint a Board of Enquiry with the following membership to investigate this accident:

R.F. Wilkinson - Chairman
G.V. Bull
H. Jones
R. Perusse
L.F. Smith - Secretary

The Board should report on the following factors:

- (a) The facts about the accident.
- (b) Injuries to personnel. (Medical report to be included.)
- (c) Damage to equipment.
- (d) Possible causes of the accident.
- (e) Were CARDE safety regulations followed and are they adequate?
- (f) Were Aerophysics Wing safety procedures consistent with DHB regulations in relation to the hazards of the trial?
- (g) Any other incidental factors which may have a bearing on the accident.
- (h) The Board of Enquiry recommendations.

I wish an interim report by 1200 hours, 31 July, 1959, and a complete report of the Board of Enquiry's findings as soon as all the facts have been established.

ORIGINAL SIGNED BY
L. J. L'HEUREUX

(L.J. L'Heureux)
Acting Chief Superintendent

Distribution

R.F. Wilkinson
G.V. Bull
H. Jones
R. Perusse
F. Smith

c.c. DHB - Ottawa ✓

LJL:ND

PRIORITY

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JUL 30 16 28 '59

JUL 30 16 31 259

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PP RAEPT

DE RAEMQR 1/30

P 301410Z

FM CARDE VALCARTIER PQ

TO DRB OTT

CARDE 1288

s.19(1)

PA
Notified by phone to
Ette used to MND and
to COB A.
DCS
31 July 59



AT 1800 HOURS 29 JULY 59 AN ACCIDENT OCCURRED IN AEROPHYSICS WING STOP
TWO STAFF MEMBERS [REDACTED] AND [REDACTED] RECEIVED FACIAL
INJURIES FROM FLYING FRAGMENTS STOP UMBER TWO RANGE GUN WAS BEING
CHARGED WITH OXYGEN WHEN EXPLOSION OCCURRED IN PRESSURE GAUGE STOP THEY
RECEIVED IMMEDIATE FIRST AID TREATMENT AT CAMP VALCARTIER AND LATER
TRANSFERRED TO JEFFERY HALES HOSPITAL IN QUEBEC STOP THE EXTENT OF
OUR PRESENT KNOWLEDGE SUGGESTS THAT INJURIES ARE NOT SERIOUS STOP
BOARD OF ENQUIRY HAS BEEN SET UP AND COMPLETE FINDINGS WILL BE REPORTED
IN DUE COURSE TO HQ STOP REPORT FROM MEDICAL DOCTORS IS EXPECTED SHORT
AND WILL BE COMMUNICATED TO YOU ON RECEIPT STOP

BT

CFN ~~1288 1800 29 59~~

30/1603Z JUL RAEMQR

DCS

000477

HQ SD 190461

In reply to QC SP 4539 (OA)
QC SD 190461
Dated 20 Feb 59

ARMY HEADQUARTERS
OTTAWA, Ont, 17 Mar 59

Headquarters
Quebec Command
3530 Atwater Avenue
MONTREAL 25 Quebec

Board of Inquiry - Explosive Accident
Camp Valcartier - 10 Oct 58

s.19(1)

1. The proceedings of the Board of Inquiry concerning the explosive accident at Camp Valcartier on 10 Oct 58 and the consequent injuries to the marginally-named were forwarded to this Headquarters through Defence Research Board channels in Dec 58 and have been most carefully considered by the appropriate Directorates in this Headquarters.
2. The Ordnance Instructions relevant to the destruction of explosives have been reviewed by the Director of Ordnance Services in the light of this accident and it is considered that no amendments to Ordnance Manual Vol 8 are warranted at this time.
3. The proceedings have also been reviewed in respect of Master Gunner (WOI) 's professional conduct and behaviour.
4. It has been noted that the specifications for the trade of Master Gunner Group 4 require the tradesman to have knowledge of, and training and experience in:
 - a. destroying unexploded ammunition, and
 - b. safety precautions regarding the handling of ammunition and explosives.
5. The Canadian Army Manual of Trades and Specialties paragraph 6.4.3. states that "where a tradesman is employed in a position for his trade, the Commanding Officer will be responsible for ensuring that trade proficiency is maintained. Where a tradesman is employed in a position other than for his trade, he must be able to demonstrate proficiency in his trade whenever called upon".
6. It is noted that Master Gunner (WOI) is receiving Group 4 trades pay to maintain proficiency in the functions of his trade. It is considered that the evidence in the Board of Inquiry indicates that this senior warrant officer did not display judgement commensurate with his rank, trade or military experience. Through his non-observance of safety precautions, injury was caused to himself and another NCO and damage to personal property.
7. It is noted that in the remarks of the GOC, it is considered that the Crown should not reimburse WOI for the loss of clothing and personal effects valued at \$89.17 and that consideration is being given to disciplinary action against this warrant officer.

- 2 -

8. This action by your Headquarters is concurred in, but it is considered that, in addition, Master Gunner (WOI) should be paraded before his Commanding Officer and advised of his responsibility in maintaining proficiency in all functions of his trade, and warned of the possibility of being remustered in accordance with the Manual of Trades and Specialties and QR(Army) 11.10.

s.19(1)

9. The proceedings of the Board of Inquiry as forwarded by you have been approved in this Headquarters.

Original Sgd by

(JDB Smith) ↓
Major-General
Adjutant-General

JMCM/6-8175/so'c

MEMORANDUM

HQ DRB 105-15/0 (Adm 2B3)

12 Mar 59

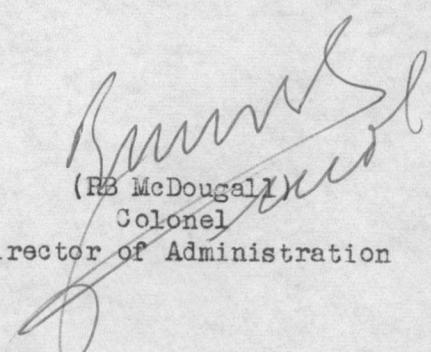
DAG

Board of Inquiry - Explosive Accident
Camp Valcartier - 10 Oct 58

s.19(1)

1. Reference is made to the memorandum dated 24 Feb 59 (folio 20, flagged "A") from the Vice Chief of the General Staff recommending that consideration be given to an appropriate administrative deduction against WOI [redacted] and that he be advised of his responsibility in maintaining proficiency in all functions of his trade or risk being remustered in accordance with the Manual of Trades and Specialties and QR(Army) 11.10.
2. Since the proceedings of the Board of Inquiry were referred to the VCGS, a further copy of the Board of Inquiry has been forwarded through Service Channels and your attention is drawn to the Remarks of the GOC, Quebec Command (folio 130, flagged "B") on the attached file. The GOC has directed that WOI [redacted]'s Commanding Officer should consider disciplinary action and that no action should be taken to reimburse WOI [redacted] in the amount of \$89.17, in respect of the clothing and personal effects which this warrant officer lost as the result of the accident.
3. It is considered that the GOC has taken action which is in accordance with the spirit of the recommendations of the VCGS and that no further action should now be taken with regard to a possible administrative deduction. It is further considered that Quebec Command should be advised that no amendment to regulations would appear to be indicated, and that action should be taken to warn Master Gunner (WOI) [redacted] of his responsibility to maintain proficiency in his trade, and the possibility of remustering.
4. If you agree, may the letter at front file cover be signed, please and the proceedings of the Board of Inquiry on the attached file be signed at the approval stamp on the Remarks of the GOC (folio 130, flagged "B").

JMCM/6-8175/so'c


(RB McDougall)
Colonel
Director of Administration

M E M O R A N D U M

DRB 105-15/0 (D ARTY)

4 Mar 59

Pers RCA

Board of Inquiry - Explosive Accident
Camp Valcartier, 10 Oct 58

1. Reference your request for comments, I have none to make on folio 20.
2. I believe it might be wise to expand upon the provisions of Chapter 1004 of Ordnance Manual Vol 8, paragraph 2 (e) (i) by stating a minimum length of the train. It is suggested that 10 feet would be suitable for dry gunpowder.
3. In assessing the amount of the administrative deduction, I recommend that it be borne in mind that Wheaton will have to replace his clothing at his own expense.

HW Sterne

(HW Sterne)
Colonel
D Arty

MEMORANDUM

DRB 105-15/0 (MT 2A)

In reply to DRB 105-15/0
Dated 12 Jan 59

24 Feb 59



AG

Board of Inquiry - Explosive Accident
Camp Valcartier 10 Oct 58

1. The specifications for the trade of Master Gunner Group 4 require the tradesman to have a knowledge of, and training and experience in:

- a. destroying unexploded ammunition, and
- b. safety precautions regarding the handling of ammunition and explosives.

2. The Canadian Army Manual of Trades and Specialties paragraph 6.4.3 states that "where a tradesman is employed in a position for his trade, the Commanding Officer will be responsible for ensuring that trade proficiency is maintained. Where a tradesman is employed in a position other than for his trade, he must be able to demonstrate proficiency in his trade whenever called upon". Master Gunner (WO 1) [redacted] is receiving group 4 trades pay to maintain proficiency in the functions of his trade.

s.19(1)

3. A review of the proceedings of the Board of Inquiry indicates that this senior WO did not display judgement commensurate with his rank, trade or military experience. Through non-observance of safety precautions, injury was caused to himself and another NCO, and damage to personal property.

4. It is recommended that Master Gunner [redacted]:
- a. be assessed an appropriate administrative deduction.
 - b. be advised of his responsibility in maintaining proficiency in all functions of his trade or risk being remustered in accordance with the Manual of Trades and Specialties and QR (Army) 11.10.

③ Adm 2
Action pls
as per minute 2

to

R. E. MIDGEBALL
Colonel
27 Feb 59

FEB 20 1959

②
W Adm
For recommendation

T.A.J.

(T. A. JOHNSTON)
COLONEL
Deputy Adjutant - General

FEB 25 1959

[Signature]
(JV Allard)
Major General
Vice Chief of the General Staff

20

MEMORANDUM

DRB 105-15/0 (MT 2A)

In reply to DRB 105-15/0
Dated 12 Jan 59

24 Feb 59

AG

Board of Inquiry - Explosive Accident
Camp Valcartier 10 Oct 58

1. The specifications for the trade of Master Gunner Group 4 require the tradesman to have a knowledge of, and training and experience in:

- a. destroying unexploded ammunition, and
- b. safety precautions regarding the handling of ammunition and explosives.

2. The Canadian Army Manual of Trades and Specialties paragraph 6.4.3 states that "where a tradesman is employed in a position for his trade, the Commanding Officer will be responsible for ensuring that trade proficiency is maintained. Where a tradesman is employed in a position other than for his trade, he must be able to demonstrate proficiency in his trade whenever called upon". Master Gunner (WO 1) [redacted] is receiving group 4 trades pay to maintain proficiency in the functions of his trade.

s.19(1)

3. A review of the proceedings of the Board of Inquiry indicates that this senior WO did not display judgement commensurate with his rank, trade or military experience. Through non-observance of safety precautions, injury was caused to himself and another NCO, and damage to personal property.

4. It is recommended that Master Gunner [redacted] :

- a. be assessed an appropriate administrative deduction.
- b. be advised of his responsibility in maintaining proficiency in all functions of his trade or risk being remustered in accordance with the Manual of Trades and Specialties and QR (Army) 11.10.

JV
Arb
(JV Allard)
Major General
Vice Chief of the General Staff

MEMORANDUM

DRB 105-15/0 (MT 2)

29 Jan 59

DMT

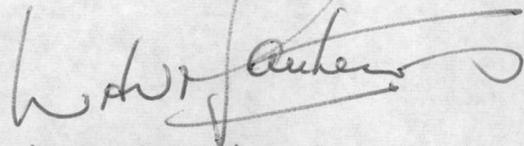
Explosives Accident

s.19(1)

1. I have read the enclosed Board of Inquiry, in conjunction with the Board of Officers on Safety Regulations. The following points emerge:

- a. Master Gunner [redacted] was trained and experienced in demolition and in disposal of explosives.
- b. Master Gunner [redacted] carried out the disposal of the surplus propellant in a manner contrary to the manner laid down in Ordnance Manual Vol 8.
- c. As a result at this accident certain injuries were suffered by Master Gunner [redacted] and Sgt [redacted]. In addition, clothing was damaged to the amount of \$125.87.

2. Contrary to the convening officer's opinion, I consider that Mr Gnr [redacted] is solely responsible for this accident, through his disregard of safety instructions and the absence of common sense precautions on his part. In order that his omissions may be brought home to him, I strongly recommend that Mr Gnr [redacted] be assessed an administrative deduction of \$125.87, this being the cost of replacement of damaged clothing.



(WHV Matthews) Lt Col
GSO 1 MT 2

*DMT
sgl*

18

② DGMT

Please study
and give
your views

MEMORANDUM

DRB 105-15/0

17 Jan 59

VCGS

Board of Inquiry - Explosive Accident
Camp Valcartier 10 Oct 58

1. Passed for your information and consideration are the proceedings of the marginally-named Board of Inquiry forwarded through DRB channels.
2. It will be noted that two members of the Canadian Army (Regular) have been injured in this accident and that since the Board was forwarded through DRB channels, no findings at area or command level have been made. It is considered however that the remarks of the Adjutant-General will be sufficient with respect to the injuries.
3. You will also note that the Board has already been reviewed on the 'Q' side and that DOS considers that no amendment to existing instructions is required.
4. It will also be noted that DOS has raised the question as to whether a master gunner is trained in this type of explosive disposal and has suggested that WO1 Wheaton may have been detailed for a duty outside his capability.
5. It will be appreciated if the proceedings could be reviewed and your comments on the Board forwarded to this Branch.
6. It may appear to you desirable that these proceedings should also be referred to the Committee arising out of the other recent explosive accident at Camp Valcartier. Before doing so however, it is felt that the question of blame and findings on injuries should be finalized.

③
DST
Comments
please
MPS

P. M. BISHOP
BRIGADIER
DGMT

JAN 15 1959

JDB Smith
(JDB Smith)
Major-General
Adjutant-General
Brif

265/1

17



MEMORANDUM

HQS 6215-1 (ORD 6)

Y3 Dec 58

D/ADM

Board of Inquiry - Explosive Accident
Camp Valcartier 10 Oct 58

Reference your letter DRB 105-15/0 (Adm 2B3) dated 11 Dec 58.

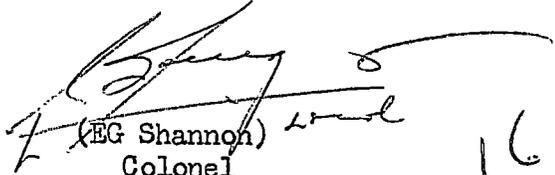
1. A review of the above board indicates that the following Chapters of Ordnance Manual Vol 8 were not observed:

- a. Chapter 1001-3 - protection of personnel during demolition or burning;
- b. Chapter 1006-8, 1006-10, 1000-11 - which state the conditions for destruction of small arms cartridges and similar small components;
- c. Chapter 1006-1 and 1006-2 which state that not more than 500 lbs of propellant or gunpowder will be burned at one time.

2. It appears that no action was taken to remove the vehicle or personnel to a safe distance before initiating the charge and that the Master Gunner was either ignorant of the nature of explosives, particularly the primary cartridges, involved or he disregarded basic safety rules which were his responsibility to obey. Whether there is blame to be placed for these actions would appear to be a D/Adm decision. There is also a question as to whether a Master Gunner is trained in disposal of explosives. In the event he is not he may have been detailed for a duty outside his capability and the person ordering the operation may be at fault.

3. The recommendations of the board in respect to amendment of the Ordnance Manual Vol 8 are not warranted as the instructions contained therein are considered adequate. Comments on the specific recommendations are:

- a. Delete para 2(e) (iii). This paragraph qualifies the length of the train as 10 feet. Since the Master Gunner, according to the evidence, used too short a train the instruction can hardly be considered at fault.
- b. The suggestion that ignition of a train of combustible material be restricted to safety fuse or electric squibs is not practical as stated in the applicable paragraphs;
- c. See Chapters 1006-1 and 1006-2.


(EG Shannon)
Colonel
Director of Ordnance Services

M E M O R A N D U M

HQ DRB 105-15/0
(Adm 2B3)

11 Dec 58

DOS
(Attn Major GK Nason)

Board of Inquiry - Explosive Accident
Camp Valcartier 10 Oct 58

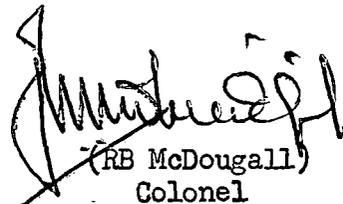
1. Passed for your information and consideration are the proceedings of the marginally-named Board of Inquiry forwarded through DRB channels.

2. It will be noted that [REDACTED] and [REDACTED] have been injured in this accident.

s.19(1)

3. No findings at Area or Command level have been made on this file but, under the circumstances of this case, it is considered that the AG's remarks will be sufficient with respect to the injuries.

4. It will be appreciated after perusal of the proceedings if you could advise this Directorate as to the question of blame, if any, and as to any action that you may consider advisable to ensure that such accidents do not recur.


(RB McDougall)
Colonel

Director of Administration

JMCM/6-8175/so'c

MEMORANDUM

ANSWER

To:

Dadm

To:

*You may
wish to see
the Bd. Please
refer it back
to DRB when
it has served
your purpose.*

10/12/58

J. A. G. C.

24973





DEPARTMENT OF NATIONAL DEFENCE
CANADA

DEFENCE RESEARCH BOARD
CANADIAN ARMAMENT
RESEARCH AND DEVELOPMENT ESTABLISHMENT

IN REPLY PLEASE QUOTE

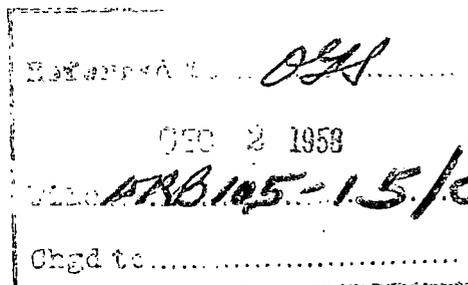
CARDEC 105-1

P.O. Box 1427,
Quebec, P.Q.

1 December, 1958.



Chairman,
Defence Research Board,
Ottawa, Ont.



CADEE Court of Inquiry
WO 1 L.E. Wheaton
Sgt. C.E. Tremblay

1. Attached please find a copy of the Court of Inquiry which was held at CARDE following an explosive accident which occurred on the 10th of October, 1958. There does not seem to be any further action required on our part and this copy is forwarded for your information and records.



② JAG/claims
Referred for information or any necessary action
2-534/ Att. DGS/staff duties
4/12/58

③ P.C.S. was legal? claim here. J.A.H. 24923

[Signature]
for Chief Superintendent.

④ JAG/claims: Referred for information to Army. 000489
9/12/58
DGS/staff duties

(R)

*N.B.—As this form is applicable to any Board of Officers or Committee or Court of Inquiry, the blank is to be filled in accordingly.

The signature of each Officer composing the Board, etc., should appear on the last page of this form in the space provided therefor.

PROCEEDINGS of a*..... Board of Inquiry.....

assembled at..... Camp Valcartier, Quebec.....

on the..... 27 Oct 58.....

by order of..... Lt-Col HJ Lake, CD
Commanding Officer, CADEE.....

for the purpose of..... inquiring into and reporting upon the.....

..... circumstances surrounding an explosive accident of.....

..... 10 Oct 58 that resulted in injury to [redacted] Mr Gnr.....

s.19(1)

..... [redacted] and [redacted] Sgt. [redacted].....

PRESIDENT

..... ZP 9308 Lt. EW Rance, CD.....
CADEE

MEMBERS

SC 96341 SM(WOI) JD Shaver, CD
CADEE

The..... Board..... having assembled pursuant to order, proceed to take evidence on oath.

1st Witness

[redacted] Mr Gnr [redacted] CADEE, having been duly sworn states:

"I, as the Master Gunner of Armament Branch of the Trials Section, Technical Services, Canadian Armament Research and Development Establishment, have been disposing of surplus explosives for the past few months whenever the plateau area of our ranges was available and the weather permissible. On 10 Oct 58 I ordered the Ammunition Section clerk, Sgt [redacted] to get a vehicle and driver and load a quantity of surplus explosive from the magazines ready for burning that afternoon. Sgt. [redacted] did this and listed the items on an Ammunition Expenditure slip.

After lunch I took Gnr [redacted] as driver and Sgt [redacted] as helper and took the large quantity of cartridges primary 3-in Mortar, igniter bags and small, powder filled, bags to the plateau area for burning.

On arrival at the usual location on the plateau Sgt [redacted] Gnr [redacted] and I unloaded the explosives and I spread the igniter bags over an area roughly fifty feet long, four feet wide and a couple of inches deep on top of which I spread a quantity of cartridges for 3-in mortar. This explosive pattern I had laid out was roughly parallel to, and about 200-ft from, the embankment along the north side of the plateau and parallel to the direction of the wind.

1st Witness (Contd)

I then proceeded to dig a fairly large hole at the pattern near the road leading onto the plateau by the OP. I had to dig this hole over two feet deep before I could get all the remaining 3-in mortar cartridges into it without them being above ground level. Sgt [redacted] and I forced the wooden boxes containing the remaining 3-in mortar cartridges apart, using the shovel, and I placed the broken wooden boxes and all the remaining cartridges in the hole.

Having positioned the explosives I made a narrow train roughly 8-ft long leading away from the hole towards the road. I ripped open several of the small, powder filled, cloth bags and used their contents to make this train then placed a few igniter bags on top of the train for a couple of feet near the hole. I then took a piece of wrapping paper from one of the empty ammunition boxes and twisted it to form a torch roughly a foot long and laid it on the ground in prolongation to the train. This was the pattern, or layout, shown to me by the previous Master Gunner and used by me in the past without incident.

s.19(1) The preparations being complete I told [redacted] to move the truck and I turned, facing the explosives, and crouched down to light the torch with a match. [redacted] had gone towards the truck and [redacted] had moved away before I turned and crouched. Normally the paper burns slowly allowing ample time to move a safe distance away before the train is ignited, however, this time there must have been a small amount of powder either in the paper or on the ground under the paper for as soon as I touched the match to the end of the paper it sparked and a flame travelled instantly to ignite the train. There were three successive blasts, each of increasing intensity in very close succession.

I had thrown myself to the ground on the first blast and I got up after the third and ran a short distance in the thick smoke before dropping to my knees and attempting to remove my waist belt so I could take off my uniform which was on fire. Sgt [redacted] and Gnr [redacted] appeared and assisted in the removal of my burning uniform. I directed Prosser to drive us to the Valcartier Station Hospital for medical treatment as fast as he could."

Q.1 Does this sketch (Annex 1) show the location of the burning?

A.1 Yes it does.

Q.2 How long have you been a Master Gunner?

A.2 Since 16 Oct 43.

Q.3 When did you assume your present duties?

A.3 1 May 58.

Q.4 Have you received any instruction on, or refresher courses covering, this function of your trade since you qualified in 1943?

A.4 No, except for a short discussion with my predecessor together with accompanying him on an explosive burning detail during the hand-over period.

- 1st Witness (contd) Q.5 Do you know of any regulations covering the burning of explosives?
A.5 No, I do not, except for the pamphlet covering demolition of blinds.

s.19(1)

(End of testimony)

2nd Witness

██████████, CADEE, having been duly sworn states:

"On 10 Oct 58 I accompanied Mr Gnr ██████████ and Gnr ██████████ on an explosives burning job. We went up to the plateau arriving around half past two. I helped the Mr Gnr and ██████████ unload the vehicle and watched whilst the Mr Gnr spread a lot of white and red bags on the ground in a pattern about fifty feet long and four or five feet wide. He (the Mr Gnr) then opened some boxes and spread what looked like shotgun shells on top of the bags. After that he (the Mr Gnr) dug a hole a couple of feet deep and I helped him open the other boxes and empty more, a lot more, of the things that looked like shotgun shells into the hole he (the Mr Gnr) had dug. We also put in the broken up wooden boxes. Mr Gnr ██████████ then opened some bags and made a path, with the powder from them away from the hole. The Mr Gnr then twisted some paper he had taken from an empty ammunition box making a wick which he laid on the ground at the end of the trail of powder.

Mr Gnr ██████████ told ██████████ to move the truck and then he turned and crouched down at the end of the paper. I turned and walked away from the piles when the Mr Gnr told Prosser to move the truck. I had only walked a short distance when I was hit on the back by a blast of terribly hot air and heard a "woof". I turned around to see what had happened and there were two more "woofs" each one getting bigger and flame and smoke spread all over the area. I turned and ran away then realized my jacket was burning. I ripped it off and saw ██████████ standing clear of the smoke near the front of the vehicle so I yelled to him to get away. ██████████ yelled back "where's the Mr Gnr?" We both ran towards the place we had last seen the Mr Gnr and found him near the back of the vehicle on his knees trying to get his waist belt off for his jacket and pants were burning. We helped him get rid of his burning clothes and he told us to get in the truck and ██████████ to drive as fast as he could to Camp Valcartier Station Hospital. When we came to the Married Quarters area he told Prosser to slow down and be careful of children as we passed through."

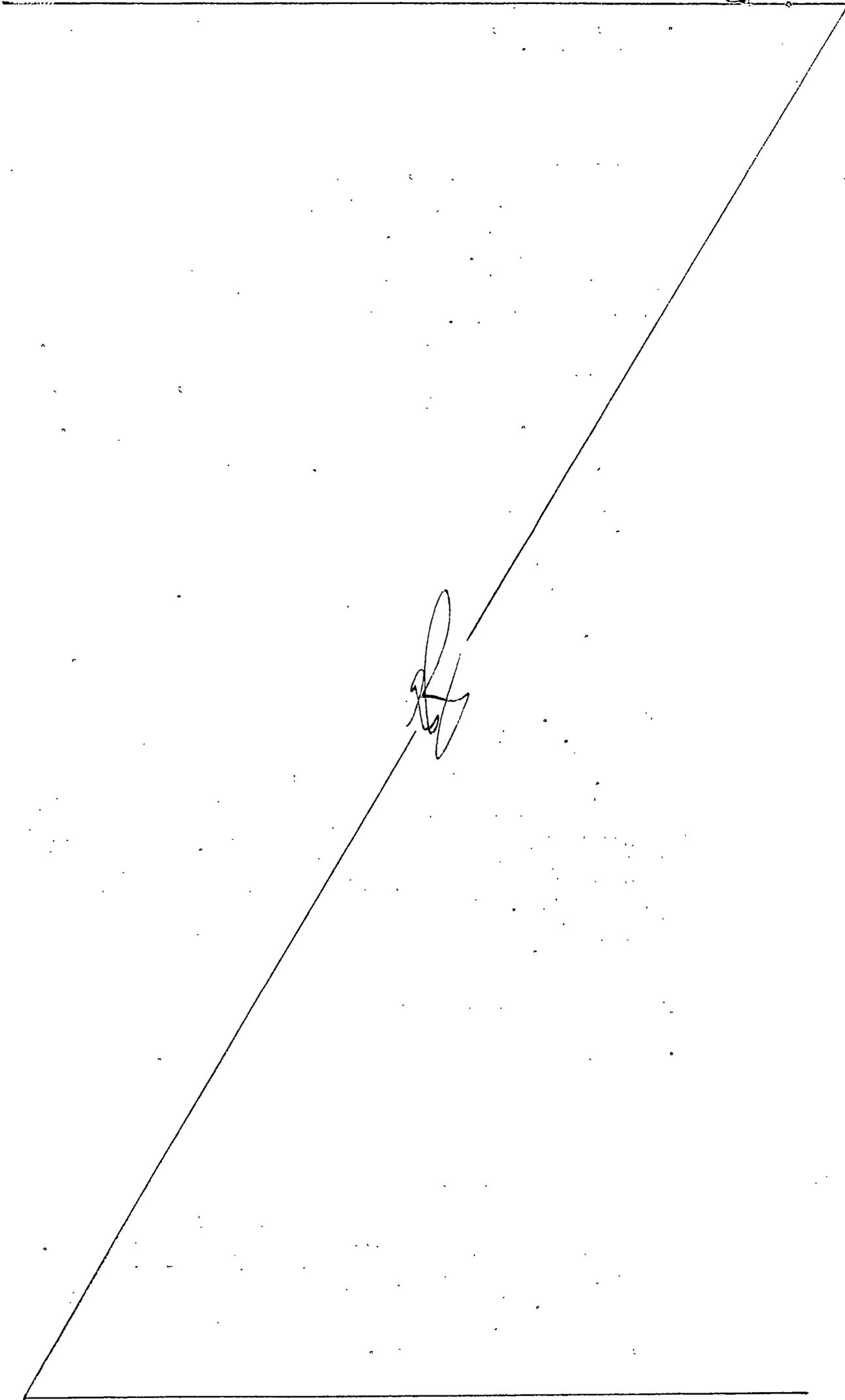
- Q.1 Did you hear Mr Gnr ██████████ tell ██████████ to move the truck when he had completed the preparations?
A.1 Yes, and when I did I turned and walked away.

(End of testimony)

3rd Witness

██████████, CADEE, having been duly sworn states:

"On 10 Oct 58 I was detailed as driver of a truck to take Mr Gnr ██████████ and some ammunition to the plateau for burning. At the plateau material was set out in a pile 2½ - 3-ft wide and about 50-ft long and 1 to 3-in high and this was to be ignited by a powder train. I saw one red bag being opened by Mr Gnr ██████████ to form this train. It appeared to me that the train was very short, approximately 2 to 4-ft.



3rd Witness (contd)

I was standing by the vehicle (Pick-up) and approximately 10-ft from Mr [REDACTED] when I saw him start to light a match to ignite the powder train. I immediately turned away and started to move away as the pile started to go. I ran approximately 100 to 150-yds at which time I heard Sgt [REDACTED] holler, I stopped and turned and found Sgt [REDACTED] running towards me. He was approximately 10-yds from me at this time and had his burning blouse partly off. I helped him take off his blouse and we looked around for Mr Gnr [REDACTED]. We thereby moved towards the burned pile and I saw him as the smoke cleared trying to remove his burning clothing about 100-ft from the pile.

Mr Gnr [REDACTED] told me to get the vehicle which was nearer the pile. I went to get the vehicle and had to remove the red flag from the vehicle as it was burning.

I drove the vehicle back to where Mr Gnr [REDACTED] and Sgt Tremblay were standing and picked up some of the burned clothes that were on the ground. Mr Gnr [REDACTED] and Sgt [REDACTED] got in the vehicle and I drove them to Valcartier Station Hospital.

I then returned to the South Site and reported the accident to Capt JH Letourneau and Capt MJ Blackwood."

Q.1 Did you hear Mr Gnr [REDACTED] give any instructions when he had completed the laying out of the explosives and before he ignited the torch?

A.1 No I did not.

(End of testimony)

4th Witness

[REDACTED], CADEE, having been duly sworn states:

"On 10 Oct 58 whilst performing my duties as clerk in the ammunition section Mr Gnr [REDACTED] informed me that the ranges were clear for burning of explosives that day and directed that I get a truck and prepare a load of surplus explosives ready for burning. I took Gnr [REDACTED] and another man and went to "O" Magazine where we loaded a quantity of surplus explosives. We returned to Gun and Carriages where I listed the items we had loaded in the truck on Ammunition Expenditure Slip No. 58/400. (Annex 2)."

Q.1 Did Mr [REDACTED] sign or see this slip?

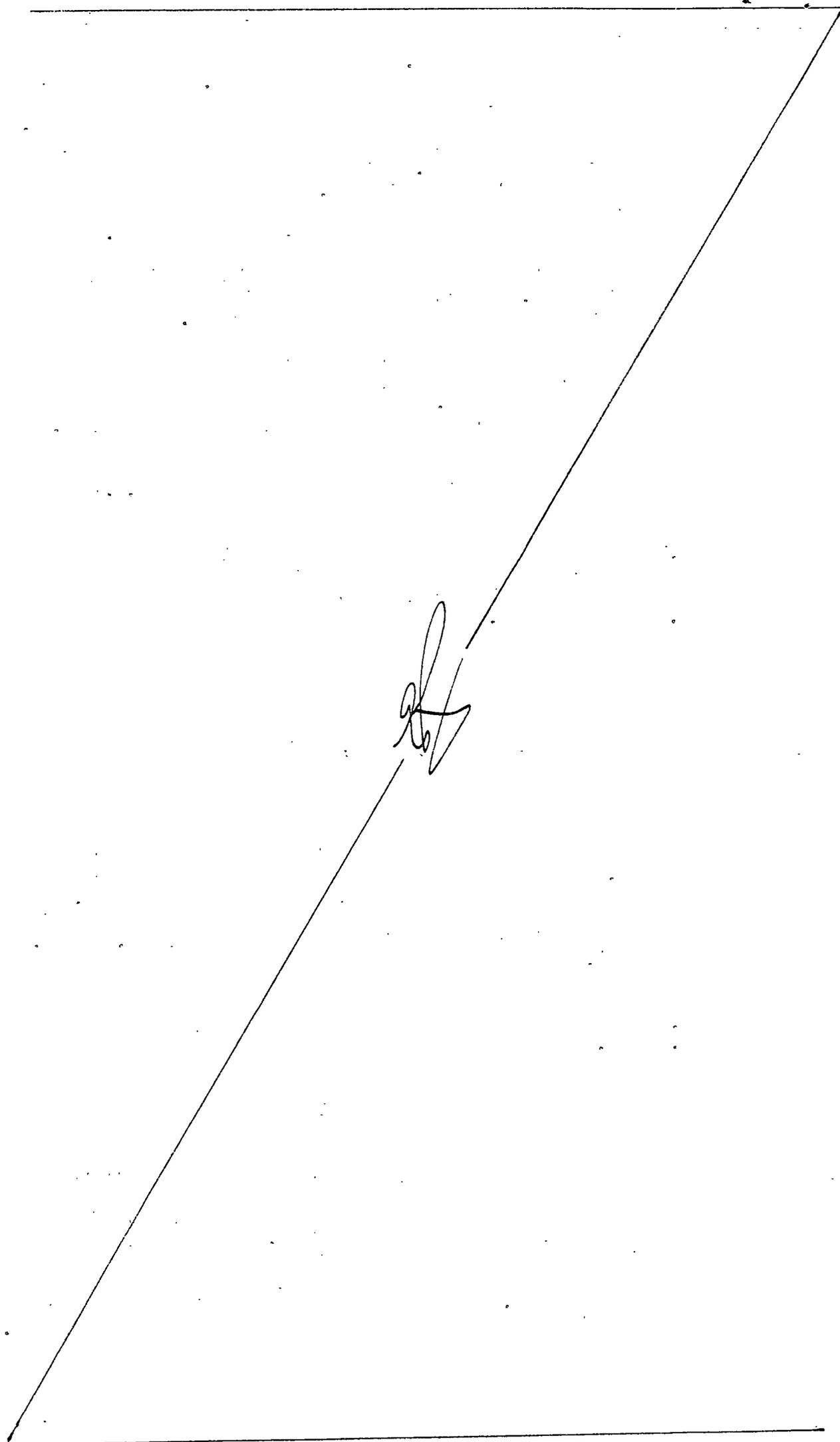
A.1 No.

(End of testimony)

5th Witness

[REDACTED], having been duly sworn states:

"I am employed, and have been for 2½ years, with the Armament Section as Ammunition Examiner. My duties involve technical advice to the Armament Officer on ammunition matters together with supervision of the magazines and Ammunition Technical Section. I was in hospital and on sick leave from 19 Sep 58 to 14 Oct 58 and was not, therefore, on duty 10 Oct 58."



- 5 -

5th Witness (cont'd) Q.1

Are you aware of any regulations covering the burning of explosives of the type listed on this expenditure slip (showing Annex 2)?

A.1 Yes - Ordnance Manual Volume 8, Chapter 1004 covers this type of burning. (Extract attached as Annex 3).

Q.2 Do you consider the site selected for this burning a suitable one?

A.2 Yes, I do.

s.19(1)

Q.3 Have you accompanied the Master Gunner on explosive burning details in the past?

A.3 Yes - I accompanied Mr Gnr [REDACTED], the previous Master Gunner, on several occasions including once when he had taken Mr Gnr [REDACTED] out to demonstrate explosive burning techniques.

Q.4 Did the techniques employed by Mr Gnr [REDACTED] in your opinion comply with Ordnance Manual, Volume 8?

A.4 Yes they did.

Q.5 I have here a breakdown of the nature of the explosives taken out by Mr Gnr [REDACTED] (attached as Annex 4), - does the G-12 listed conform to "Gunpowder" as mentioned under Ordnance Manual, Volume 8, Chapter 1004, Para. 2, Sub-para (e)(i)?

A.5 Yes it does.

Q.6 Do you know of any regulation that prohibits the use of wrapping paper from an ammunition box in the making of a train of combustible material?

A.6 No, I do not know of any such regulation.

Q.7 Do you know of any regulation limiting, by weight or by number, the amount of explosive material which may be burned in the open at any one time?

A.7 I know of no Canadian regulation, however, Regulations for Army Ordnance Services, Volume 4, Pamphlet 21, Part 1, a British publication distributed for information purposes, does cover this subject quite extensively.

(End of testimony)

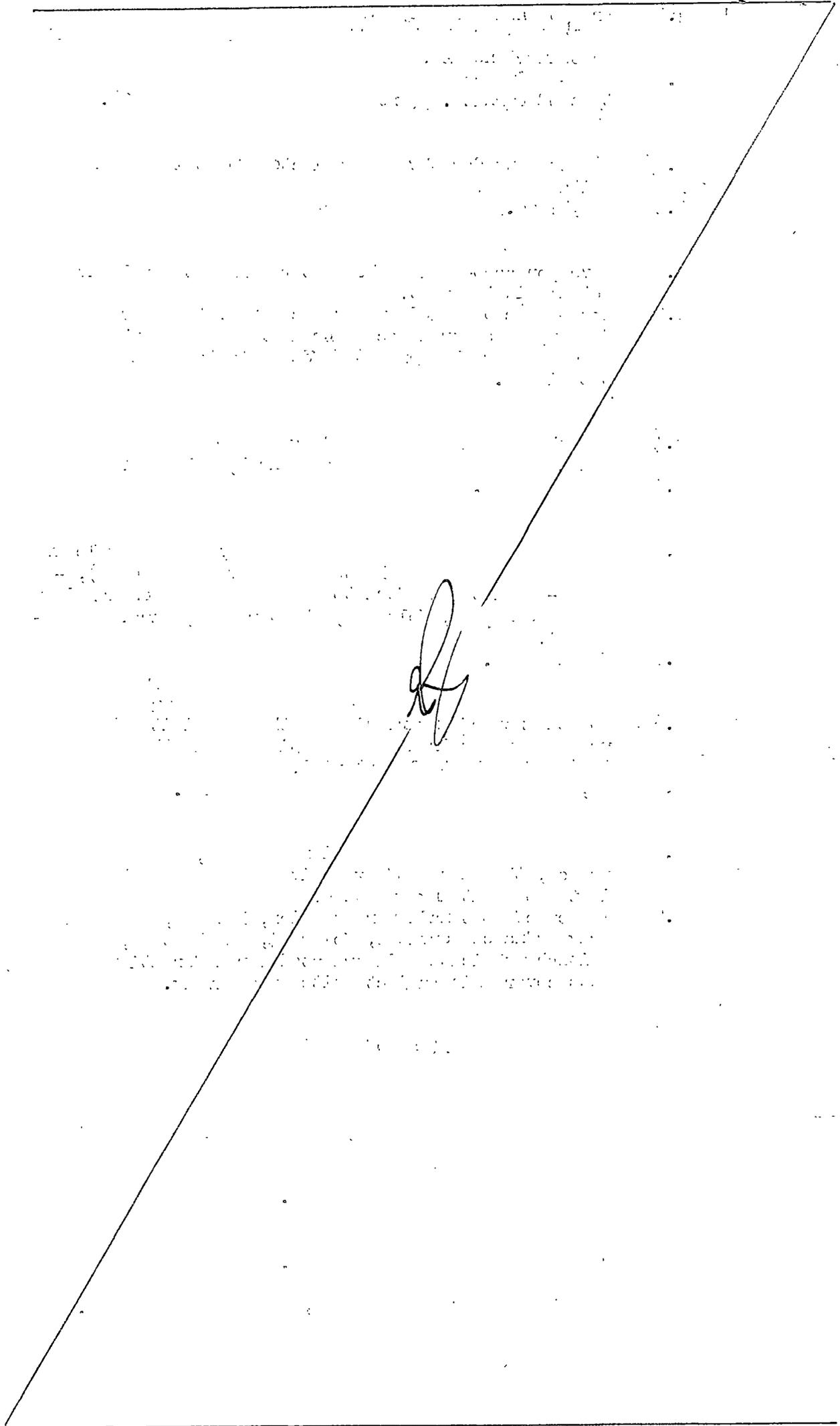
6th Witness

The following statement of injuries was received from [REDACTED] Capt AM Laflamme, RCAMC, of Quebec Military Hospital:

[REDACTED] admitted to hospital 10 Oct 58 with 1st and 2nd degree burns covering 40% of body.

[REDACTED] admitted to hospital 10 Oct 58 with 1st and 2nd degree burns covering 10% of body.

CAFB 371, Report on Injuries, forwarded 17 Oct 58."

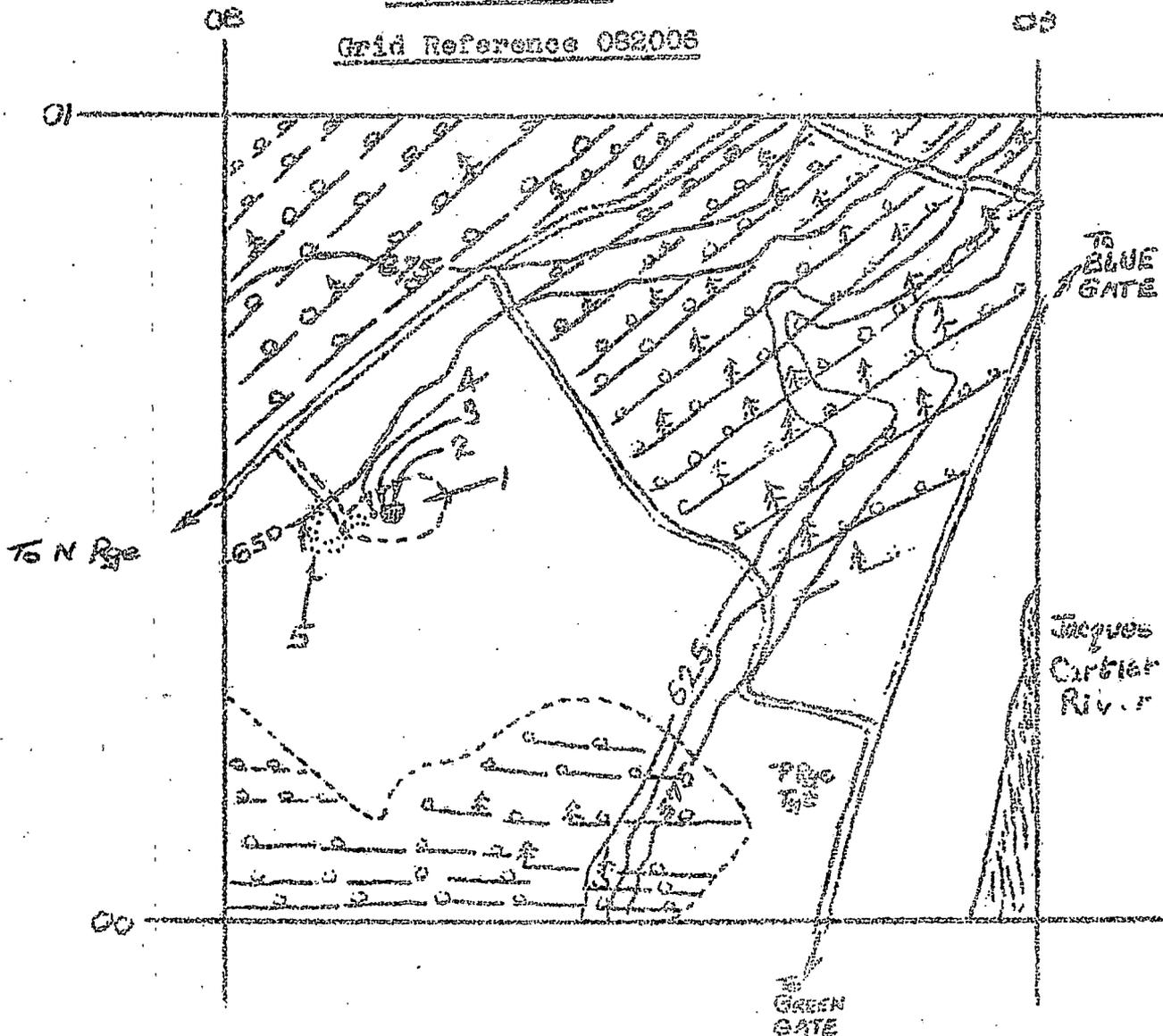


ANNEX 1
to Board of Inquiry
dated 27 Oct 58

Site of Accident 10 Oct 58

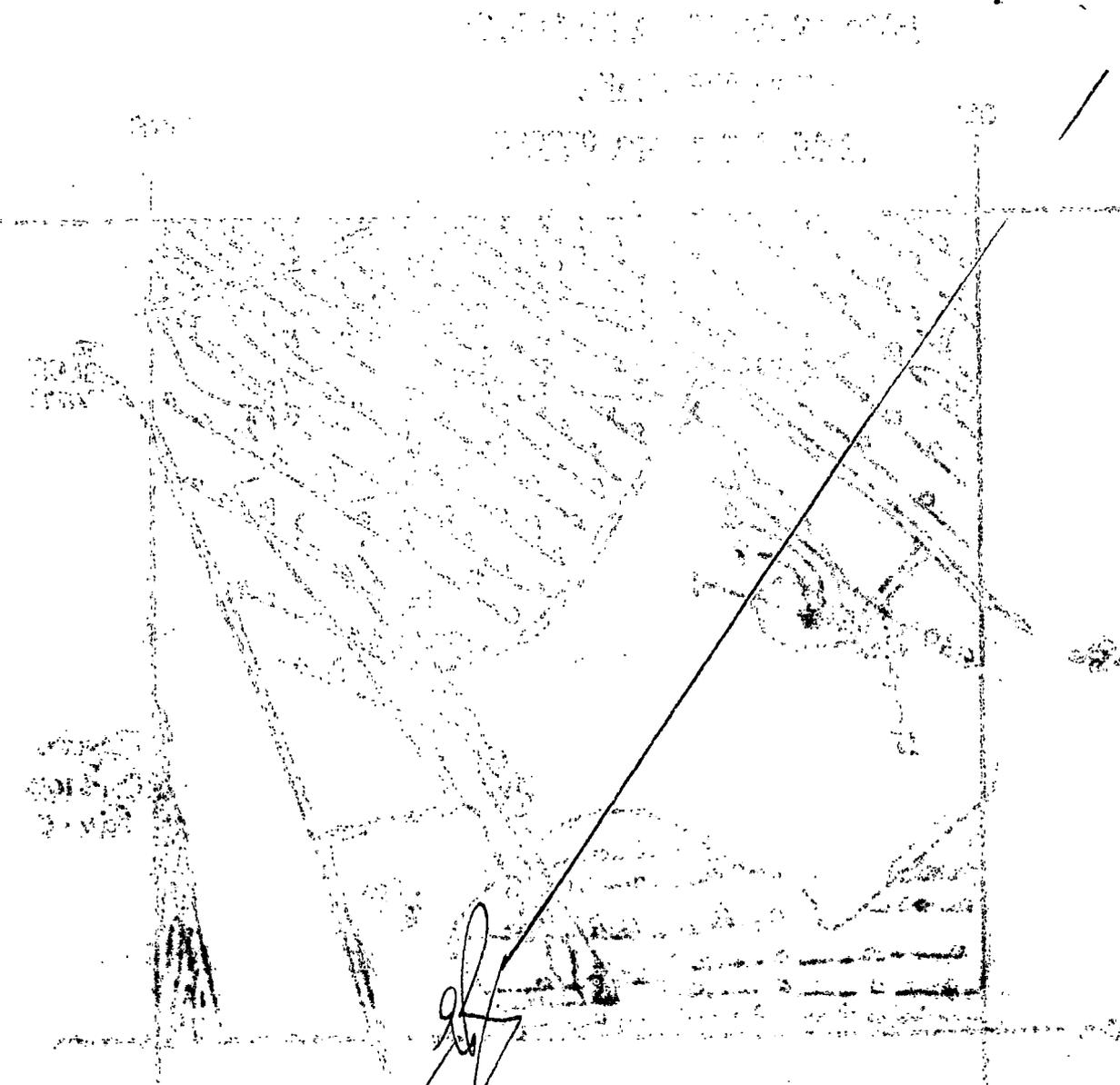
Map ASE No. 36

Grid Reference 082006



1. Debris Area, 150-ft x 100-ft approximately
2. Burned area, 30-ft x 20-ft approximately
3. Hole, 37-in x 26-in x 18-in deep dug by shovel
4. Mound of earth from hole, 41-in x 33-in x 12-in high
5. Path of vehicle leaving scene of accident; vehicle was parked with rear towards explosives with rear wheels 22-ft from hole

Note; Fragments of boxes and burned igniter bags cover whole area also cartridges, primary, 3-in, mortar.



1. The purpose of this document is to provide information on the project.

2. The project is a study of the effects of the proposed development on the environment.

3. The study will be conducted in accordance with the requirements of the Access to Information Act.

4. The results of the study will be made available to the public.

5. The project is being funded by the Government of Canada.

6. The project is being managed by the Department of the Environment.

7. The project is being completed by the end of the year.

8. The project is being completed by the end of the year.

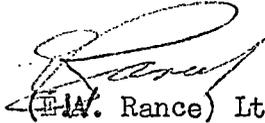
9. The project is being completed by the end of the year.

10. The project is being completed by the end of the year.

AMMUNITION EXPENDITURE

NO ...58 400...

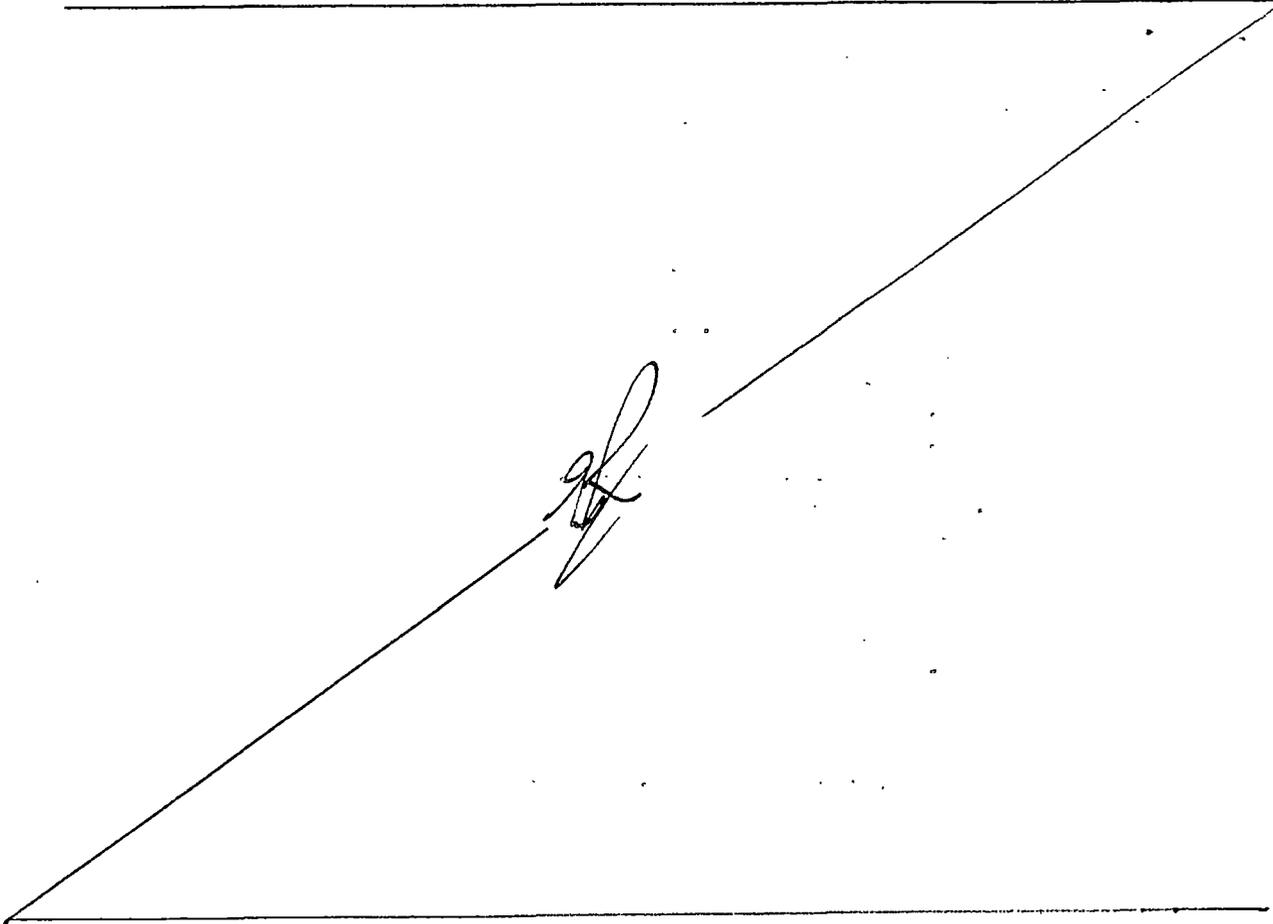
DETAIL NO. DESTROYED BY BURNING:- STOCK OF
 AUTH:- CADC Disposal Form 87
 TRIAL NO. DATE 10 Oct 58
 255-92459 d/20 June 58 DRB 720-15/0 TD 7220 DOS

ISSUED TO	NOMENCLATURE	LOT NO.	AMOUNT
1	IGNITERS CARTRIDGE Q.F. CD 30		1853
	IGNITERS CARTRIDGE B.L.		
2	°2-Oz A (4.5")		4335
3	"B" 4.5" Filled		655
4	"C" 4.5" Filled		2229
5	CARTRIDGES: M.L. Mortar 91-Gr. Hercules Mk. 1 Lot 95-1880 (101 C/L 4208) 263-242 I certify that I have compared this with the original and it is a true copy thereof.  (P.A. Rance) Lt.		8971

ISSUED BY J.A. Diggins

ISSUED TO

VOUCHER NO. E-1207 dated 16 Oct 58



A large, empty rectangular box with a diagonal line from the top-right corner to the bottom-left corner. A handwritten signature is located in the center of the box.

ANNEX 3
to Board of Inquiry
dated 27 Oct 58.

EXTRACT
ORDNANCE MANUAL VOLUME 8
CHAPTER 1004

DESTRUCTION BY BURNING

Methods

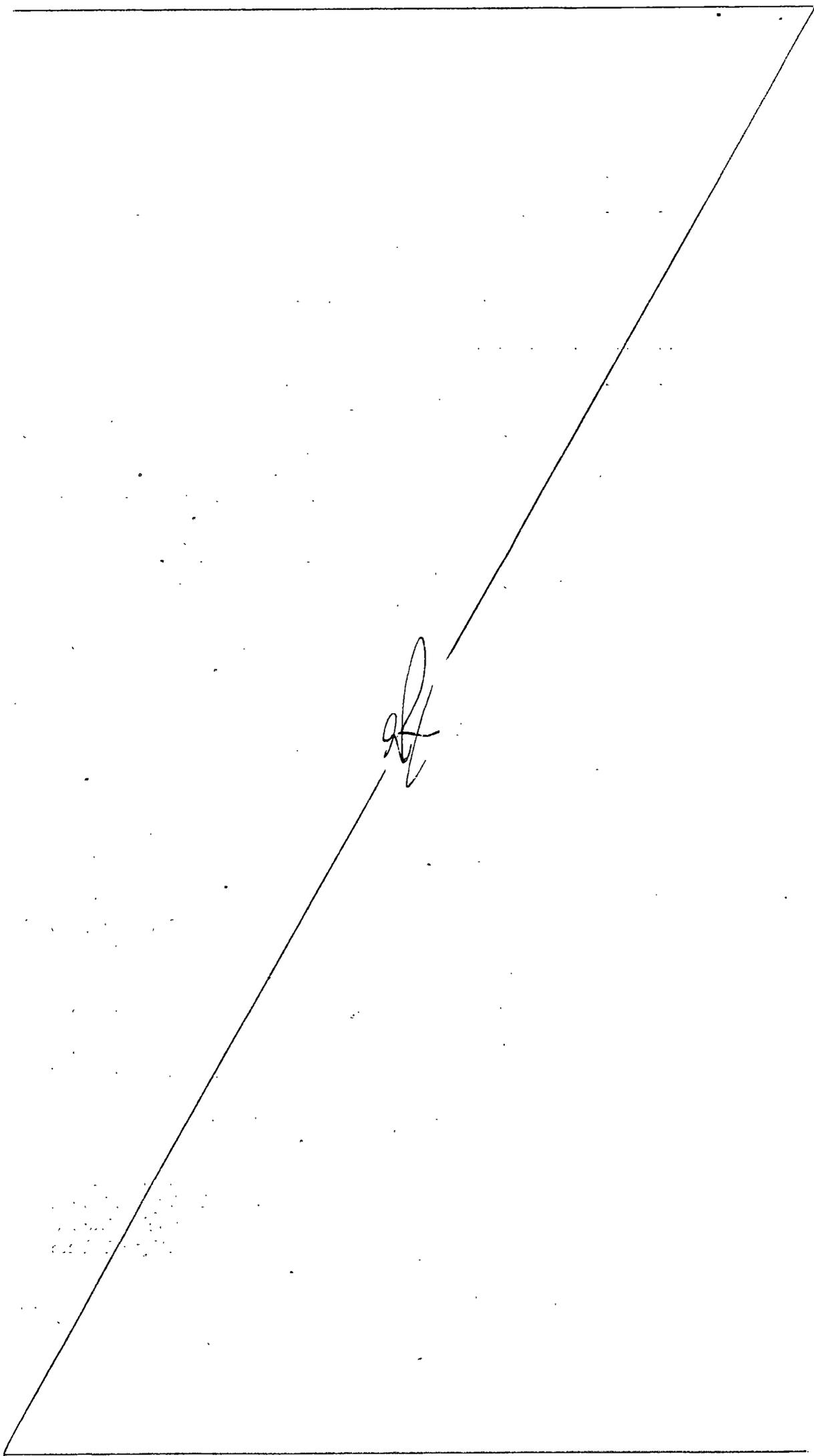
8-1004-1 There are two methods of burning ammunition as follows:

- (a) By burning in the open
- (b) By burning in an incinerator

Burning in the Open

8-1004-2 Burning in the open consists essentially of spreading out a specific quantity of ammunition on top of the ground, or in a shallow trench about 18 inches deep, and igniting the ammunition from a safe distance by means of a train of combustible material. The train of combustible material may, in turn, be ignited either by safety fuse or by an electric squib. This method will be used for the burning of gunpowder, large quantities of propellant and some high explosives. When using this method, the following safety precautions and methods will be observed:

- (a) Ammunition to be burned will be spread out parallel to the direction of the wind.
- (b) Train of combustible material in contact with the ammunition to be burned will be laid out on the side opposite the direction of the wind so that burning will take place towards the wind.
- (c) The length of safety fuse will be sufficient to allow personnel to retire to a minimum distance of 100-feet. In no case will the length of safety fuse be less than three (3) feet.
- (d) Safety fuse must be well anchored to prevent the burning end from curling around and prematurely igniting the ammunition,
- (e) Train of combustible material may be composed of:
 - (i) Dry gunpowder, though this is not recommended as it is extremely sensitive to spark or friction.
 - (ii) Sticks of propellant laid in a double line about seven feet long.
 - (iii) Excelsior or other similar combustible material about ten feet long. This type of train must be ignited by an ordinary match since electric squibs and safety fuse normally will not produce sufficient flame.
- (f) Ammunition to be burned may be supplemented, if necessary to increase burning, with waste oil or excelsior.

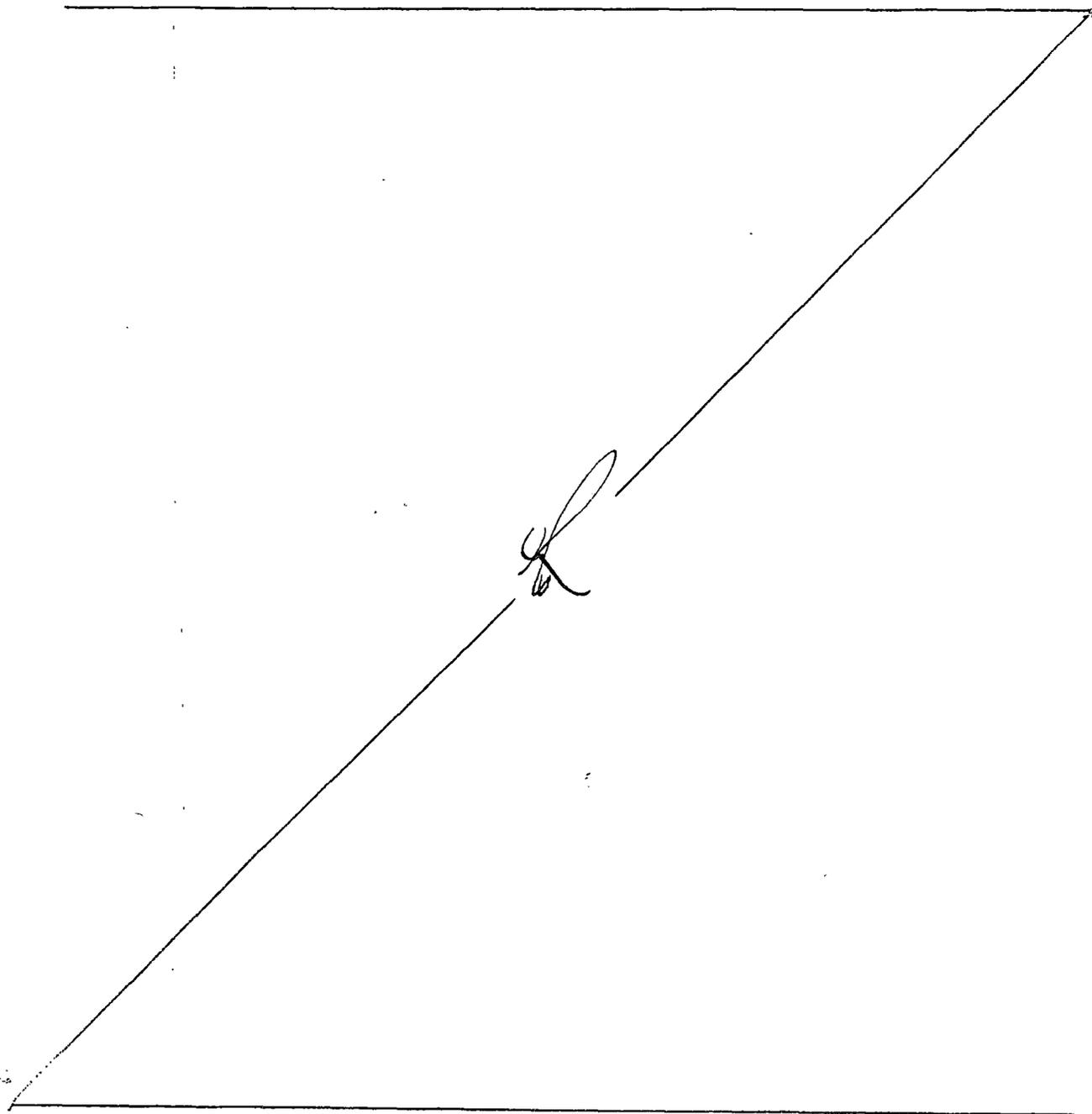


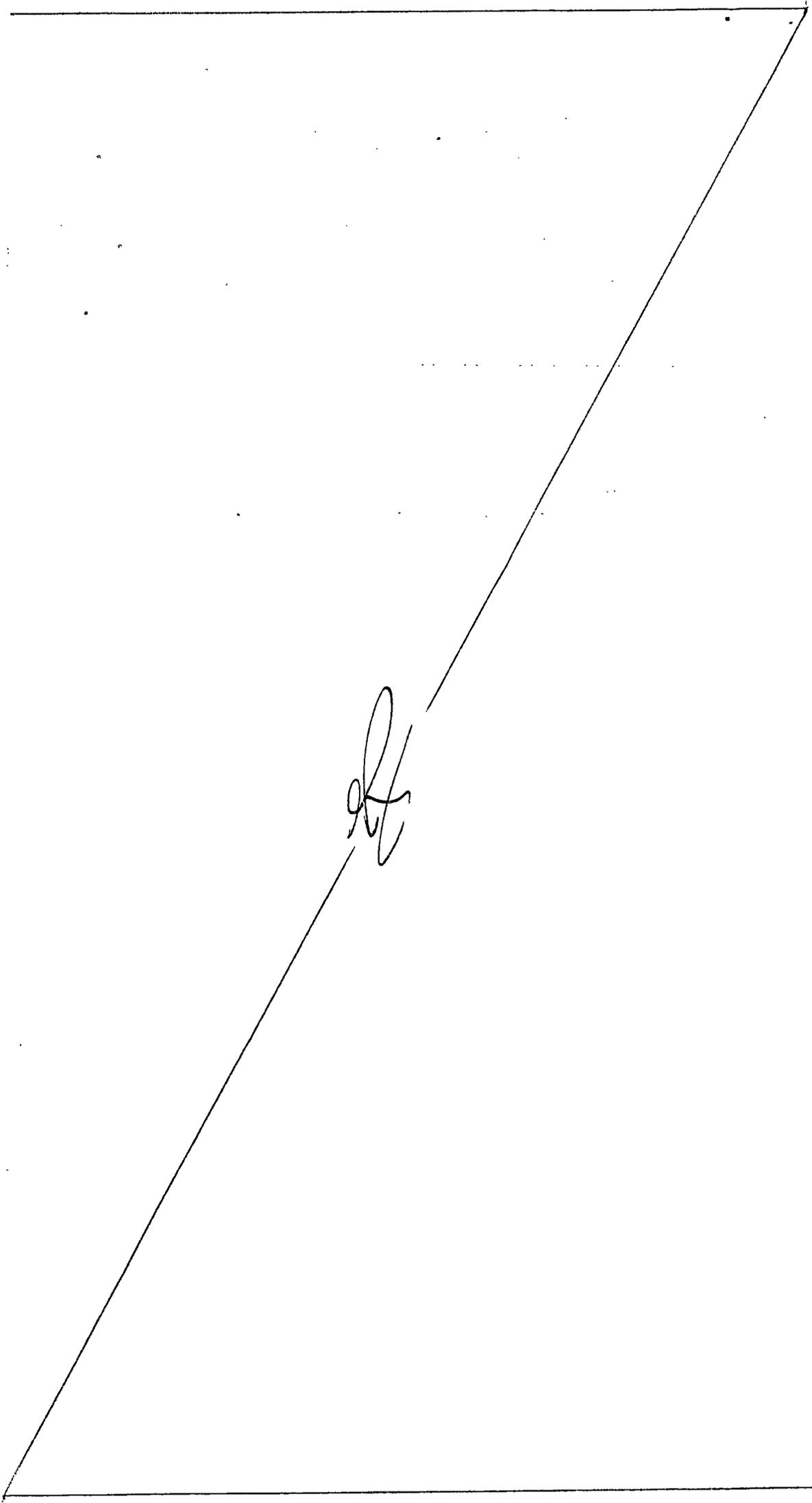
ANNEX 3
to Board of Inquiry
dated 27 Oct 58

- (g) Ground will be watered after each burning and inspected to ensure that no remnants are still smouldering. Unburnt remnants will be collected and included in the next burning operation.
- (h) At least 30 minutes must elapse between successive burnings on the same ground due to the possibility of residual heat remaining in the ground.
- (j) Under no circumstances will more ammunition be added to the pile after burning has started.

Burning in an Incinerator

AMDT 4 - APR 55
(Original sub-section 1004-2 (a) deleted).



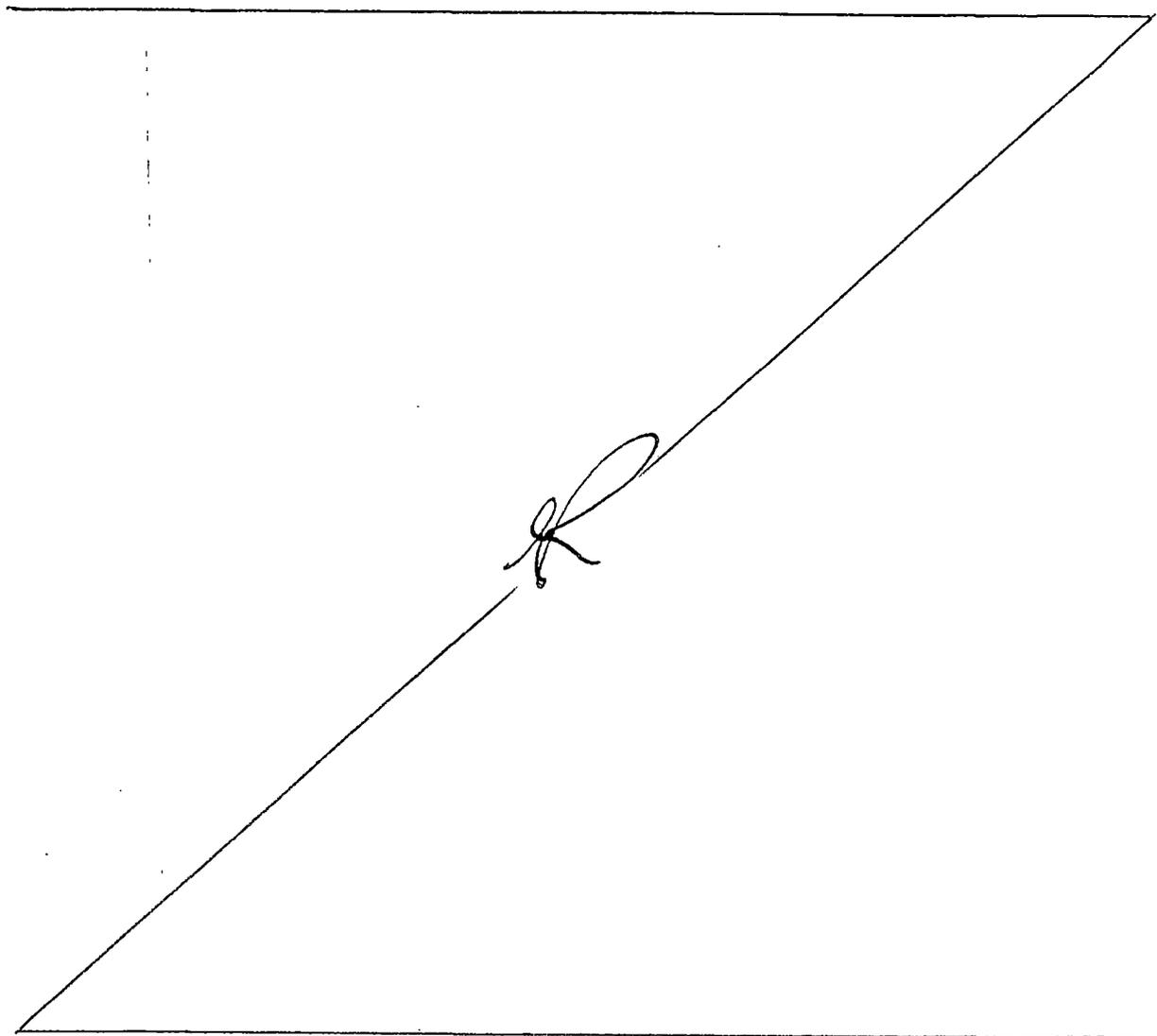


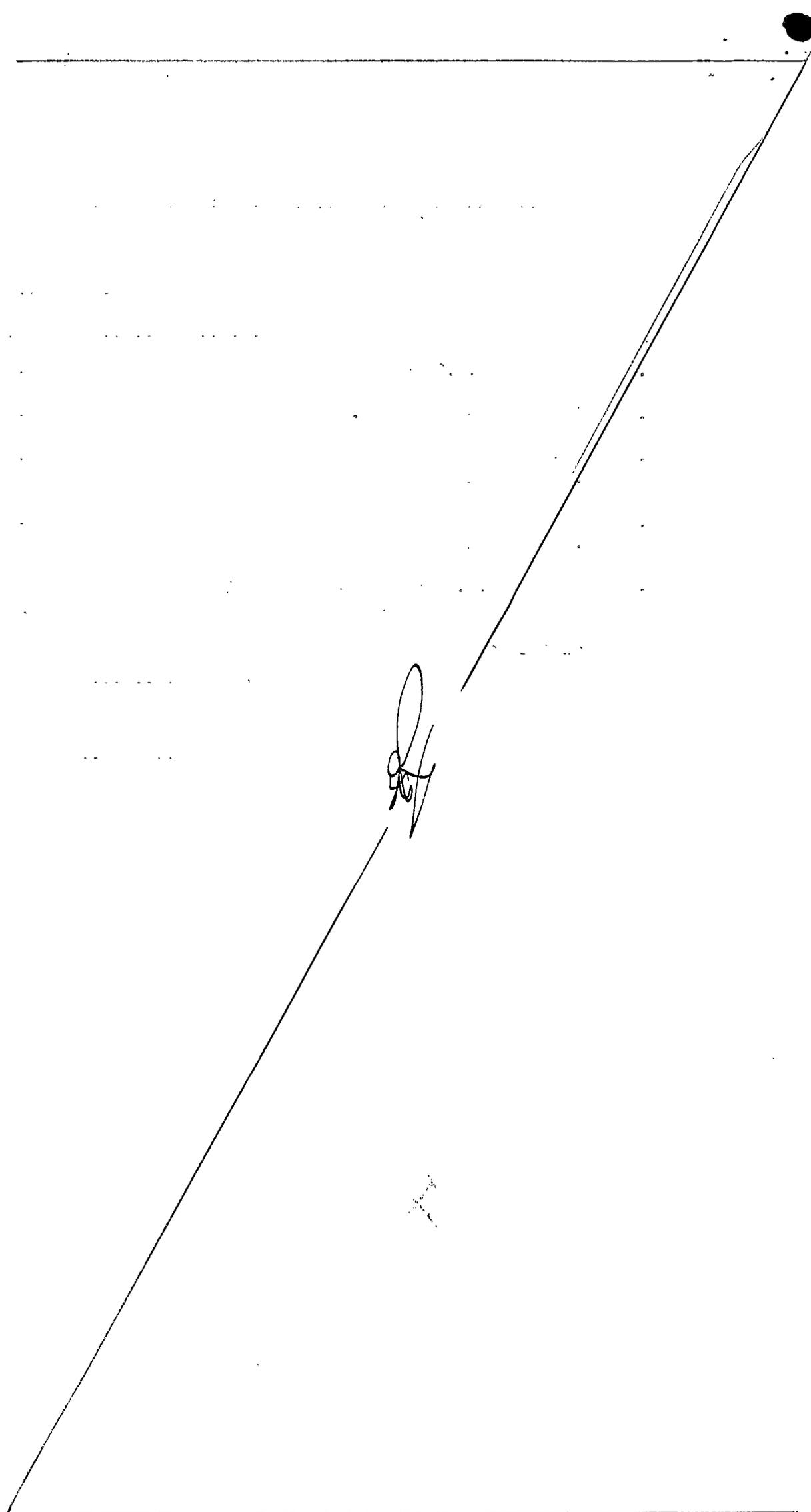
ANNEX 4
to Board of Inquiry
dated 27 Oct 58

LIST OF STORES FOR DESTRUCTION - 10 OCT 1958
Showing Weight and Type of Explosive

		<u>EXPLOSIVE</u>	
	<u>QUANTITY</u>	<u>WEIGHT</u>	<u>TYPE</u>
1. IGNITERS QF C.D.30 (25 Pr)	1835	51 lbs	G-12
2. IGNITERS BL 2-ozs "A" (4.5" Gun)	4335	542 lbs	G-12
3. IGNITERS Cartridge BL "B" (4.5" Gun) Filled	655	41 lbs	G-12
4. IGNITERS Cartridge "C" (4.5" Gun) Filled	2229	278 lbs	G-12
5. CARTRIDGES M.L. Mortar 91-Gr Hercules Mk 1 Lot 95-1880 (101 C/L 4208) 263-242-6732	8971	116 lbs	Hercules Mk. 1

	Total	1028 lbs	





ANNEX 5
to Board of Inquiry
dated 27 Oct 58

Property of [REDACTED]

s.19(1)

	<u>COC No</u>	<u>Item</u>	<u>Cost</u>
a.	CB 312518	Blouses, Battledress	10.80
b.	CB 312519	Trousers, Battledress	8.30
c.	CB 311496	Shirts, Khaki nylon	7.03
d.	CB/B 312661	Tie, Khaki	.30
e.	IA/313660	Belts, waist, web patt 37	1.24
f.	NCN	Shoes, brown	18.00
g.	NCN	Watches, wrist, Buren	39.95
h.	CGB 2275	Caps, Forage, khaki	5.58
j.	NCN	Buckles, waist belt with crest	1.50
k.	CB 308212	Socks, khaki, nylon	.77
l.	CC 650	Suspenders	.55
		Total Cost	<u>94.02</u>



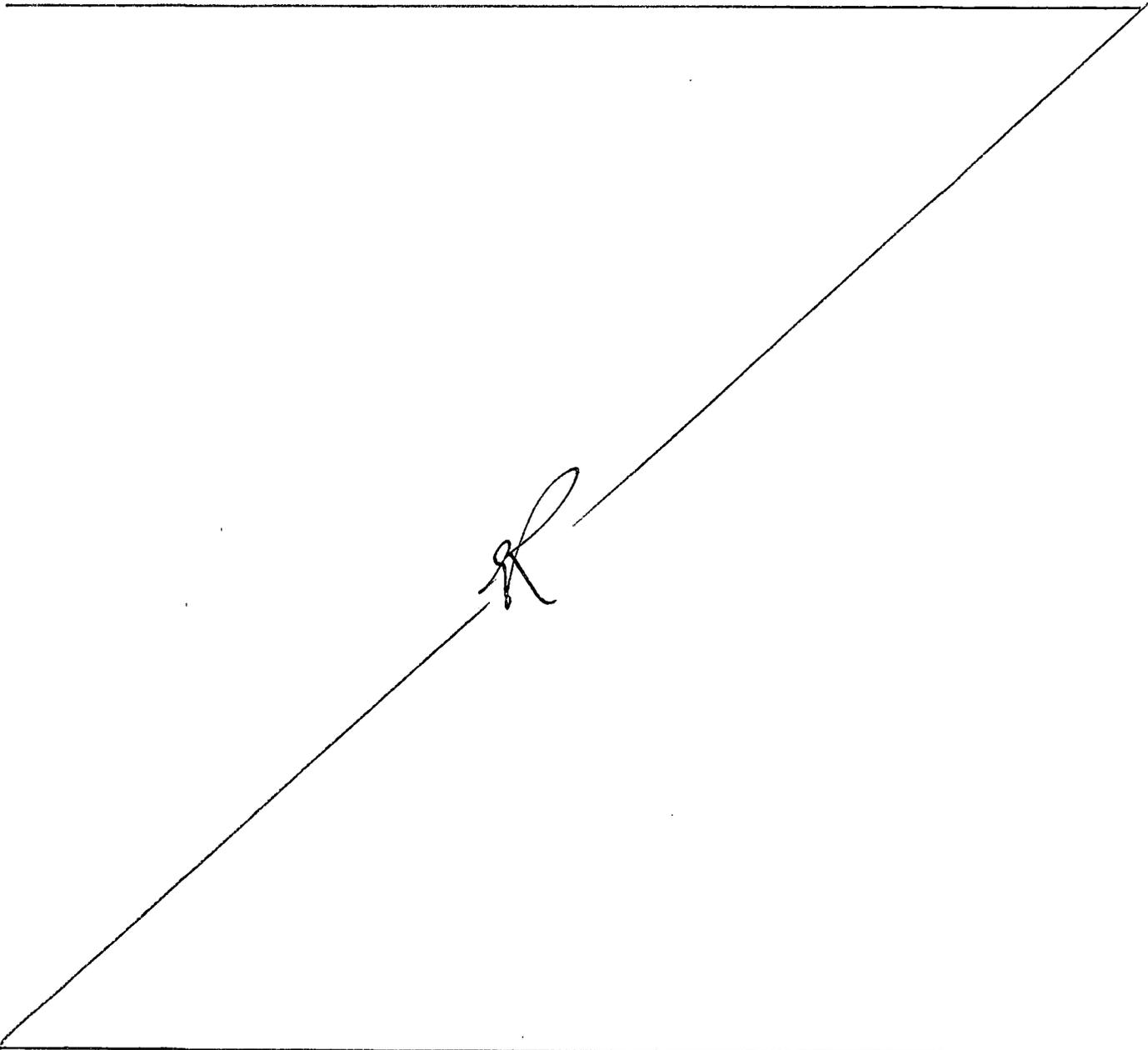


ANNEX 6
To Board of Inquiry
dated 27 Oct 58

Property of [REDACTED]

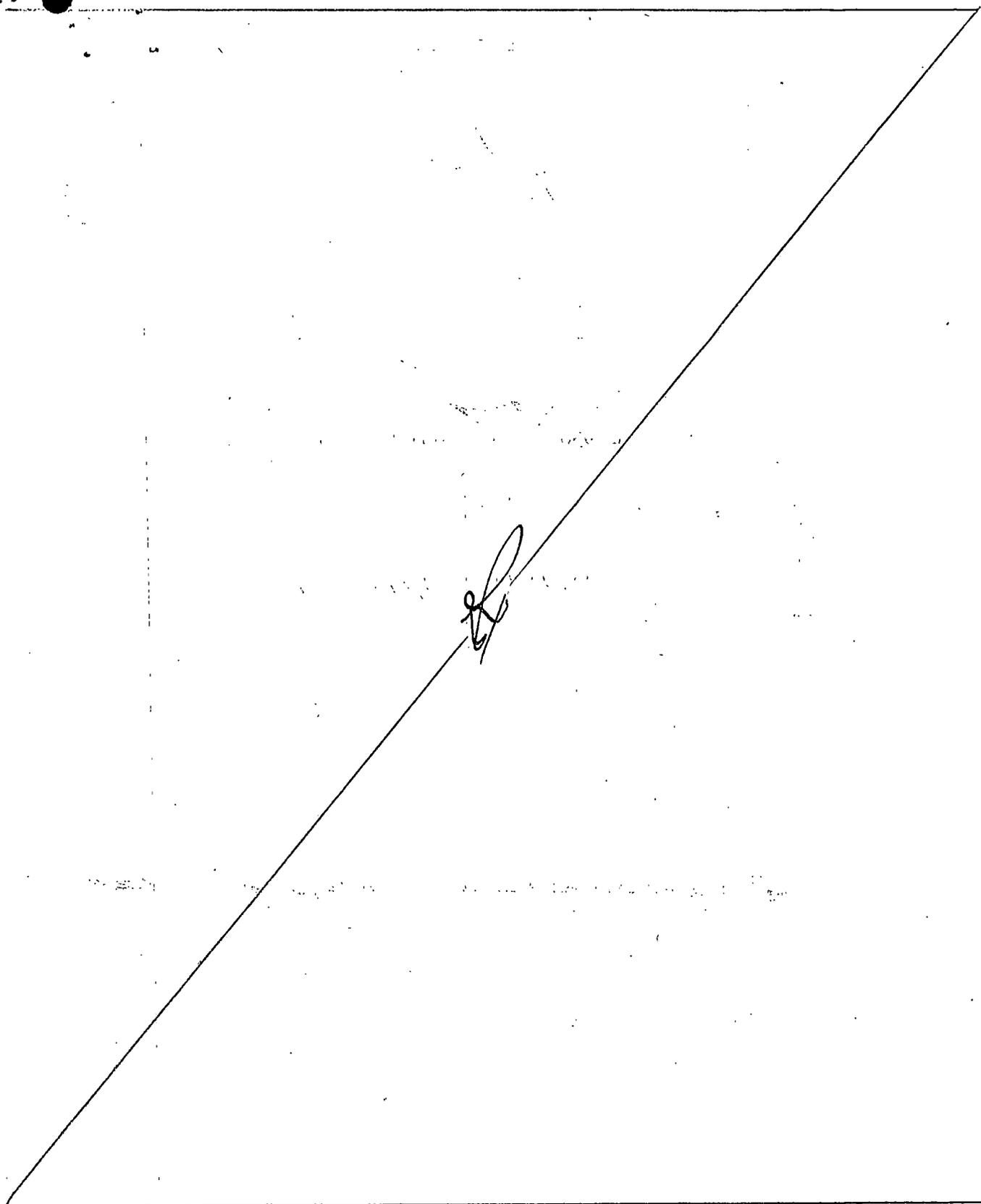
s.19(1)

	<u>COC No.</u>	<u>Item</u>	<u>Cost</u>
a.	CB 312518	Blouses, battledress	10.80
b.	CB 312519	Trousers, battledress	8.30
c.	CB/B 312661	Tie, khaki	.30
d.	CF/B 8750A	Shoes, black	6.60
e.	CB 2100	Socks, black	.40
f.	CG 313869	Caps, Forage, blue	4.90
g.	CC 650	Suspenders	.55
		Total Cost	<u>31.85</u>



[Handwritten signature]

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[Handwritten signature/initials]

List of Annexes

- Annex 1 Sketch of site of accident.
- Annex 2 Ammunition Expenditure Slip No. 58 400 of 10 Oct 58.
- Annex 3 Extract from Ordnance Manual Vol 8 Chapter 1004.
- Annex 4 Breakdown, by weight and type, of explosive items involved.
- Annex 5 Personal property of [REDACTED] destroyed in the accident.
- Annex 6 Personal property of [REDACTED] destroyed in the accident.

s.19(1)

~~FINDING IF REQUIRED:~~

[Handwritten signature]

[Handwritten signature]
ZP 9308 (EW RANCE) Lt RCA (Signature)

Signed at

PRESIDENT

Camp Valcartier, Que

CADEE (Unit)

this third day of

SC96341 (JD SHAVER) SM(WO) (Signature)

November 19 58

CADEE (Unit)

MEMBERS

(Signature)

(Unit)

Opinion of
Commanding
Officer:—

[Handwritten signature]

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Findings of the Board:-

s.19(1)

1. The accident was caused when Mr Gnr [REDACTED] inadvertently;
 - a. Had explosive material in, or under, the paper train laid in prolongation to the gunpowder train and;
 - b. Used too short a train of combustible material leading to dry gunpowder.
2. Mr Gnr [REDACTED] and Sgt [REDACTED] were on duty when the accident occurred.
3. No blame can be laid to any person for this accident.
4. The injuries suffered by Mr Gnr [REDACTED] and Sgt [REDACTED] are, in both cases, directly attributed to military service.
5. There was no loss of, nor damage to, public property occasioned by this accident, except for flag of local pattern, no value.
6. Loss of non-public property was occasioned in the destruction by burning of clothing and equipment of Mr Gnr [REDACTED] and Sgt [REDACTED] as listed at Annexes 5 and 6.

Recommendations of the Board:-

1. It is recommended that:
 - a. Mr Gnr [REDACTED] be reimbursed in the amount of \$94.02 in accordance with CAO 166-1, para 3, to replace destroyed personal property.
 - b. Sgt [REDACTED] have personal clothing in the amount of \$31.85 replaced at public expense in accordance with CAO 166-1 para 10.
2. It is further recommended that consideration be given to:
 - a. Periodic refresher courses for tradesmen whose employment leaves important functions of their trade unpracticed for long periods of time.
 - b. Amending Ordnance Manual, Volume 8, Chapter 1004 as follows:
 - (1) Delete paragraph 2 (e) (iii).
 - (2) Restrict the ignition of trains of combustible materials detailed under paragraph 2 (e) (i) and (ii) to safety fuze, or electric squibs, terminated in suitable igniters where required.
 - (3) Inclusion of a table to Chapter 1004 showing safe weights for burning of various explosive materials together with safety distances.

REMARKS OF THE GENERAL OFFICER COMMANDING QUEBEC COMMAND.

1. The findings of the Board, the opinion of the Commanding Officer and the remarks of the Area Commander are concurred in generally, with the following exceptions:-

a. The loss of clothing to [REDACTED], should be \$89.17 and not \$94.02.

b. The evidence of the Board indicates that [REDACTED] has been negligent, but this is of a minor character only. Because of this negligence on the part of [REDACTED], the Crown should not reimburse him for the loss of clothing and personal effects and his Commanding Officer should consider disciplinary action in the case of this Warrant Officer.

s.19(1)

2. It is directed that the cost of replacement of Sgt. C.E. Tremblay's clothing, in the amount of thirty-one dollars and ninety-eight cents (\$31.98), as per ANNEX 6, be made a charge to the public.

APPROVED

(sgd)(JM Rockingham)

(JM Rockingham)

Major-General

General Officer Commanding

Mar 17th 1959

(sgd) JDB Smith)

(JDB Smith)

Major-General

Adjutant-General

Montreal, Que.

18 FEB 59.

COMMAND ORDNANCE OFFICER'S REMARKS

Board of Inquiry - Injuries

[REDACTED]

- s.19(1)
1. It is the opinion of the I.O.O. Quebec Command that [REDACTED] with his knowledge of gunpowder should have been more careful and used a longer train of combustible material leading to the dry gunpowder.
 2. It is recommended that all demolitions should be carried under the supervision of SP 34986 QMS (WO 2) Davidson W.A. who is a qualified ammunition examiner Group 4.
 3. It is pointed out that the amount of the claim for [REDACTED] [REDACTED] should be \$89.17 instead of \$94.02. Maximum compensation for a watch in accordance with Appx "A" to CAO 166-1 is \$35.00.

(sgd)(J E Tucker)
(J E TUCKER) Lt-Col
Command Ordnance Officer
Quebec Command

OPINION OF THE COMMANDING OFFICER

1. I agree with the findings of the board and agree that no particular blame can be attached to any person for this accident as all safety regulations were in fact followed.

2. I do feel, nevertheless, that a man who has had the training and experience of a Master Gunner should have taken extra common sense precautions particularly with regard to the following:-

s.19(1)

(a) Waiting until Sgt [REDACTED] and Gunner Prosser were in a place of safety before lighting the "paper train".

(b) Use of a much longer train.

(c) Use of paper for the train from a source other than the ammunition box to avoid possibility of contamination.

In this sense I feel that Mr Gnr [REDACTED] did not show the judgment commensurate with his rank and trade.

3. I agree with the Recommendations of the Board except para 2(a) as I feel it should be unnecessary for a senior tradesman to undertake refresher courses and it would probably be impractical to try and carry out such selective refresher training courses.

4. Regarding Board recommendation 2(b) as an interim measure local instructions fitting CADEE needs are being issued which amplify and increase the safety margins laid down in Ordnance Manual Volume 8 chapter 1004.

5. I recommend: (a) Mr Gnr [REDACTED] be reimbursed in the amount of \$94.02 in accordance with CAO 166-1 para 3 to replace destroyed personal property. (b) Sgt. [REDACTED] have personal clothing in the amount of \$31.85 replaced at public expense in accordance with CAO 166-1 para 10.



(H.J. Lake) Lt. Col.
Commanding CADEE

~~SECRET~~

Cont.

FILE
 NUMBER

DRB 105-15/0

VOL.

DEPARTMENT OF NATIONAL DEFENCE

ACCIDENTS

C.A.R.D.E.

*new cover
 PA*

FOR CROSS REFERENCES SEE INSIDE COVER

ROUTING				P.A. AND B.F. ENTRIES				REGISTRY ONLY	
REFERRED	REMARKS	Date of Pass	Initials	Date of P.A.	Initials	Date of B.F.	Cancel B.F.	Date Received	Inspected by
DGS (3)	¹⁷⁻⁷⁻⁶¹ with papers OK	20/7/61	CL						
CJE	min 2, done	20/7/61	DB						
DWR		21/7/61	end						
DGS	min 4, please	27/7/61	PTT						
A/C/A			2						
DGS		8-8-61	Red F			11-9-61	cancel	10/9/61	
with (3)	WITH PAPERS CR SEP 5 1961 1-9-61 OK								
CJE		6/9/61	DB						
CofA		7/9/61	hand						
DGS	Mr. Humphrey	7-9-61	CL						
Request	PL please	8-9-61	CL/Hand	8/9/61	CL			SEP 8 1961	
Request	Request	11/9/61	CL	12/9/61	CL				
with (3)	WITH PAPERS CR NOV 3 0 1961 25-11-61 OK								
DWR (9)		12/61	DB						
CJE		4/12/61	PTT						
Compt		4/12/61	hand						
DGS	in per min 2	6/12/61	PTT						
JAC/c	min per	11/12/61	PTT						
DGS (9)		12 Dec 61	PTT						

FILE
NUMBER

DRB 105-15/0

DEPARTMENT OF NATIONAL DEFENCE

• ACCIDENTS
 • C.A.R.D.E.

USE INSIDE COVER FOR CROSS REFERENCES

ROUTING				P. A. AND B. F. ENTRIES				REGISTRY ONLY	
REFERRED	REMARKS	Date of Pass	Initials	Date of P.A.	Initials	Date of B.F.	CANCEL B.F.	INSPECTED	STATION NUMBER
D/Compt	22/2/67 WITH PAPERS CR FEB 24 1967	22/2/67	W 431-1 TD 7095						
RMD/DRB	min pl.	5/4/67	SL	5/4/67	SL				
is/compt	Per Request	12-2-68	CF						
A/CDRB	min 2, please	15/7/68	SL						
boff		19/7/68	SL						
D/Compt	Returned	22/7/68	SL	23/7/68	SL				000522