

DRB 105-25/0

DRB 105-25/0

2 GSO-1097

DEPARTMENT OF NATIONAL DEFENCE

## ACCIDENTS

D.C.I.E.M.

**USE INSIDE COVER FOR CROSS REFERENCES**

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

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DRB 105-25/0

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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

DRB 105-25/0 (DGS)

Ottawa, Ontario,  
April 24, 1962.

Chief Supt.,  
D.R.M.L.

Explosion - DRML  
February 28, 1962

1. Your report, DRML 626-1 dated March 19, 1962, regarding the explosion, with the report of Mr. J. Royce attached, has been read with interest, and it is indeed fortunate the consequences were not more serious.
2. Now that the cause of the explosion has been established, we are sure all due precautions will be taken to guard against the possibility of the intrusion of foreign substances within such mechanisms in future.

Signed by  
C. W. WILSON

AKR:ld

Chairman.

DRBC STACEY, Norman Edward

Ottawa, Ontario,  
April 16, 1962.

Mr. L. A. Aitken,  
Government Employees Compensation Branch,  
Department of Labour,  
Royal Bank Chambers,  
100 Sparks Street,  
Ottawa, Ont.

Dear Mr. Aitken,

Re: Report of Major Accident to  
STACEY, Norman Edward  
Defence Research Medical Laboratories,  
Downsview, Ontario

Reference your letter, No. 13-2-17-3-2-6-56 dated  
March 14, 1962, with Form GE.26 in duplicate, attached.

Returned is a copy of the form completed at the  
Defence Research Medical Laboratories, together with a photo-  
graph of the high pressure chamber which exploded, and a copy  
of a report, prepared by the Technical Services Section, after  
the explosion occurred.

Yours truly,

Original Signed by  
C. A. WINNER

Chairman.

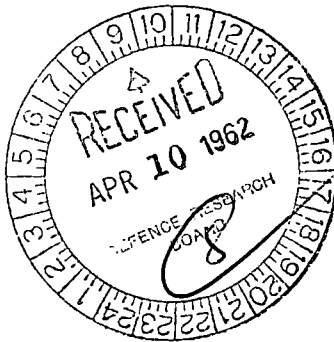
AKR:ld  
Att. 3

c.c. - DRB 105-25/0



DRM/Stacey, N.E.  
OUR FILE REF. ....

DEPARTMENT OF NATIONAL DEFENCE  
DEFENCE RESEARCH BOARD

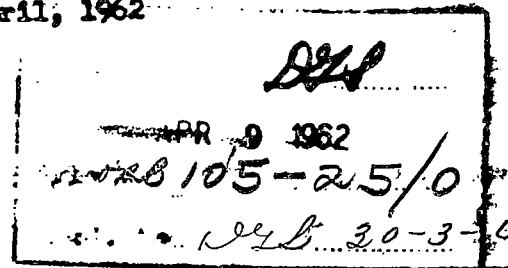


Defence Research Medical Laboratories,  
Post Office Box 62, Postal Station "K",  
Toronto, Ontario.

6 April, 1962

C D R B

Report of Major Accident  
STACEY, Mr. Norman Edward



1. As requested in your DRBC Stacey, Norman Edward,  
DRB 105-1 (DGS), dated 16 March, 1962, attached are completed  
forms G.E. 26.

*[Signature]*  
for Chief Superintendent  
Defence Research Medical Laboratories

*Copy for DRB 105-25/0  
orig mail on RM6: STACEY, Norman Edward.*

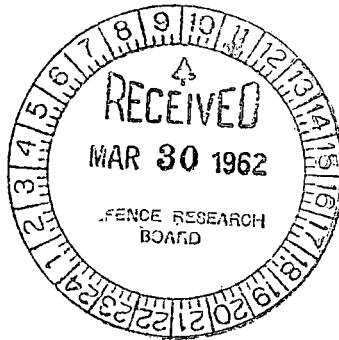
IN REPLY PLEASE QUOTE

DRML 626-1



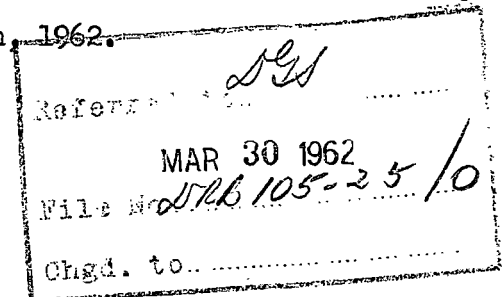
DEPARTMENT OF NATIONAL DEFENCE  
CANADA

## DEFENCE RESEARCH BOARD



Defence Research Medical Laboratories,  
Post Office Box 62, Postal Station "K",  
Toronto, Ontario.

19 March, 1962.



C D R B

Explosion Report - D.R.M.L.  
28 February, 1962

1. In accordance with instructions for Investigating and Reporting of Fires and Explosions the following is a report in connection with an accident which occurred at D.R.M.L., at 1510 hours, 28 February, 1962.

2. Below are extracts from a report made by Mr. W.J. Watson, D.R.M.L.'s Safety Officer, who was directly involved in this accident.

- (a) "The accident involved the use of a high pressure chamber which exploded causing damage to the laboratory in which it was located. Two of the three persons in the vicinity of the accident received injuries of a minor nature.
- (b) As a Technical Officer I'm engaged in a research project on oxygen poisoning. The project requires the use of a special pressure vessel for exposing small animals to oxygen at high pressures. In order to describe this accident it is necessary to have some idea of the apparatus and how it is used.
- (c) The apparatus consists of a 12" diameter steel cylinder about two feet long with a door at one end. Both the door and the back end are provided with viewing ports made of armour safety plate. The tank is fitted with a circulating pump which circulates the chamber gases through a soda-lime trap to remove carbon dioxide from the system. The pump is driven by an electric motor which is located outside the chamber and is not in contact with the oxygen. The pump is especially constructed to operate under pressure and requires no lubrication.

(d) In using this apparatus animals are placed in the chamber in plastic boxes. The desired pressure is obtained from a compressed gas cylinder. During the exposure period the circulating pump is in continuous operation.

(e) At the time of the accident animals had been placed in the chamber and the desired pressure was being approached. At this time I heard a grinding noise in the pump. I leaned over to observe the pump and as I did so I noticed a glow inside the chamber. Realizing that the situation was dangerous I shut the oxygen supply off and took cover on the floor. In less than a second a violent explosion took place.

APR 9 1962

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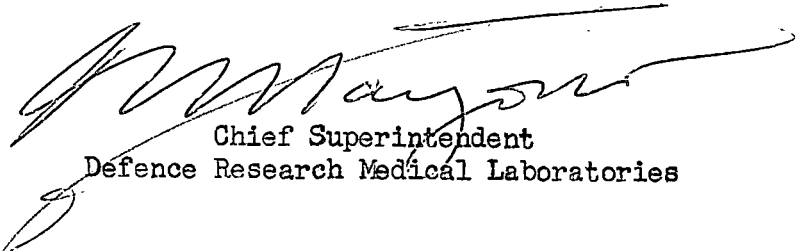
- 2 -

- (f) The two other persons in the same area were Mrs. A. Camire and Mr. N. Stacey. Mr. Stacey was in an adjoining office and may have received some injury to his ears from the blast. Mrs. A. Camire was working within 15 feet of the apparatus but realizing something was wrong she took cover on the floor between two laboratory benches and except for a minor cut on the leg from a particle of glass was unhurt.
- (g) Some windows in the room where the explosion took place and in an adjoining office were blown out. Some laboratory glassware was broken and the walls and furniture were marked from flying particles.
- (h) Examination of the exposure chamber showed that the front window had been blown out and that a fire had taken place inside."

3. The damage to the rooms involved amounted to \$150.00 the greater part of this being glass, i.e. the windows and the glass doors of the laboratory cupboards. No serious damage has become evident in any of the scientific equipment in the laboratory.

4. Photographs showing the damage to the room and to the pressure chamber are enclosed.

5. Attached is a copy of a report prepared on the pressure chamber after the explosion by our Technical Services Section.

  
Chief Superintendent  
Defence Research Medical Laboratories



M E M O R A N D U M

15 March, 1962.

To: Administrative Officer

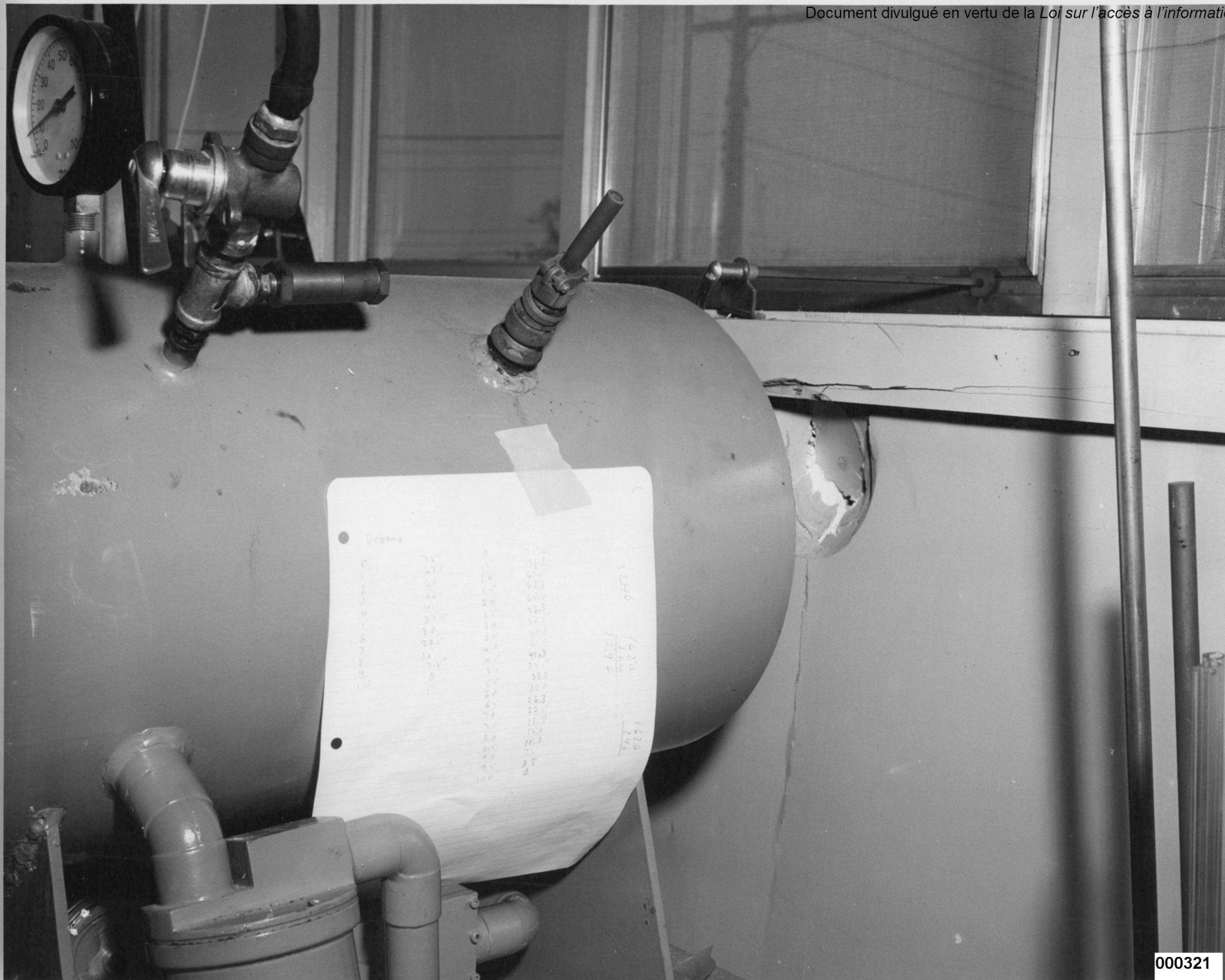
From: J. Royce

Re: Malfunction of Rat Pressure Chamber

1. The following is a report on the findings of an inquiry into the malfunction of the Rat Pressure Chamber.
2. On the 28th Feb. 1962, while an experienced technician was performing the operations necessary for a normal run on this equipment, there was a fire within the pump mechanism resulting in a violent explosion. This fire caused a rapid build up of pressure within the vessel and resulted in the failure of the weaker component which was the larger of the two windows located in the door of the chamber. The glass in these windows is  $\frac{1}{2}$ " Armour Plate, capable of taking a stress of 100 p.s.i. with a safety factor of 4.
3. The pressure build up in the system was something over 400 p.s.i. when the glass blew out which would give a 20,000 lb accumulative pressure on the 8" glass window.
4. From the appearance of the inside of the pump it seems obvious that the fire started in this component and was burning for some time before it was apparent in the chamber itself.
5. The accompanying photo # 1 shows the charred condition of the inside of the bakelite pump housing. Evidently the flame propagated up through the pump outlet line and into the chamber itself. During the burning in the pump, the pump impeller, which is steel, was melted and the impeller disintegrated. (The burnt impeller and a new one are shown in contrast in Photo # 2). This could account for the unusual noise in the pump just prior to the explosion. This noise was the factor which first attracted the attention of the operator to the malfunction.
6. Having established the location of the source of the fire, the reason for the ignition was investigated. The pump impeller drive motor, a 1/15 HP Bodine, A/C motor, is located completely outside the pump housing and drives through rubber belts the pump impeller shaft. The location of all electrical components was decided upon, being mindful of the explosion hazards involved with oxygen under pressure. The pump impeller bearings are made of a non metallic material called Chemlon. The bearing is non conductive, non metallic, is not impregnated with any type of lubricant and requires no lubrication. John Crane and Co. supplied the bearings and recommended them for our use with pressurized oxygen.
7. Upon examination an oily or greasy substance was found on the impeller shaft and in the chemlon bearings. Acting upon the suggestion of W.Cdr Stubbs, I.A.M., I was able to get the Ontario Crime Laboratory, through a personal contact, to do a test on this substance. The results of this test indicate that it was either petroleum or animal fat and in either case is highly inflammable. There is no doubt in my mind that this was oil and should not have been present under any circumstance. Since all members of the T.S. Section are instructed to do no work in the lab without instructions from the supervisory personnel of the TS Section I am at a loss to explain why this oil was present.

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**COURRIER OFFICIEL**

**DEPARTMENT OF NATIONAL DEFENCE**  
**MINISTÈRE DE LA DÉFENSE NATIONALE**

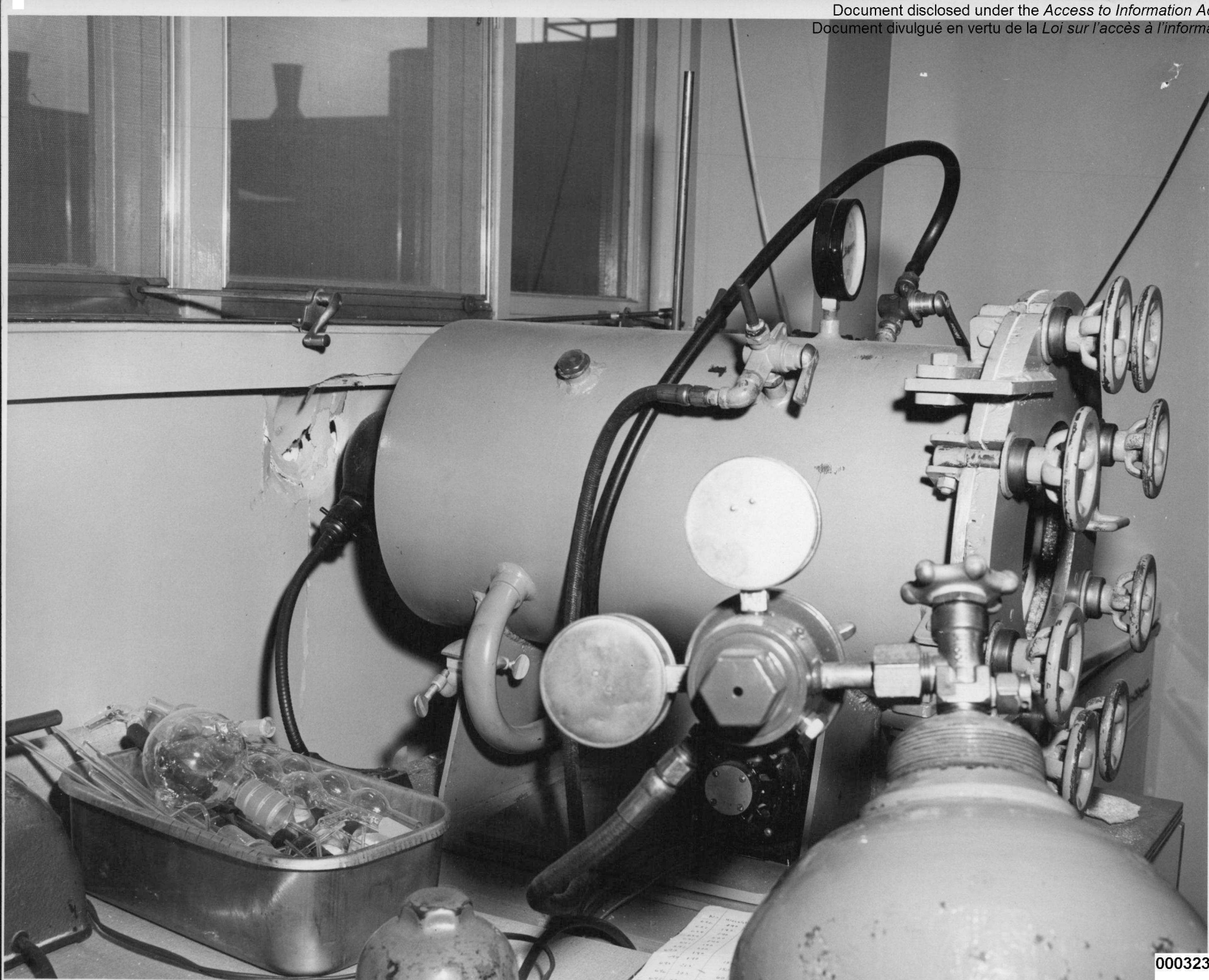


File #105.75/0 Re explosion in a high pressure  
14 March 1962 Chamber R.M.L. transmission Feb  
28. 2 - 62

Chamber - Right side from front.

# 6231-7



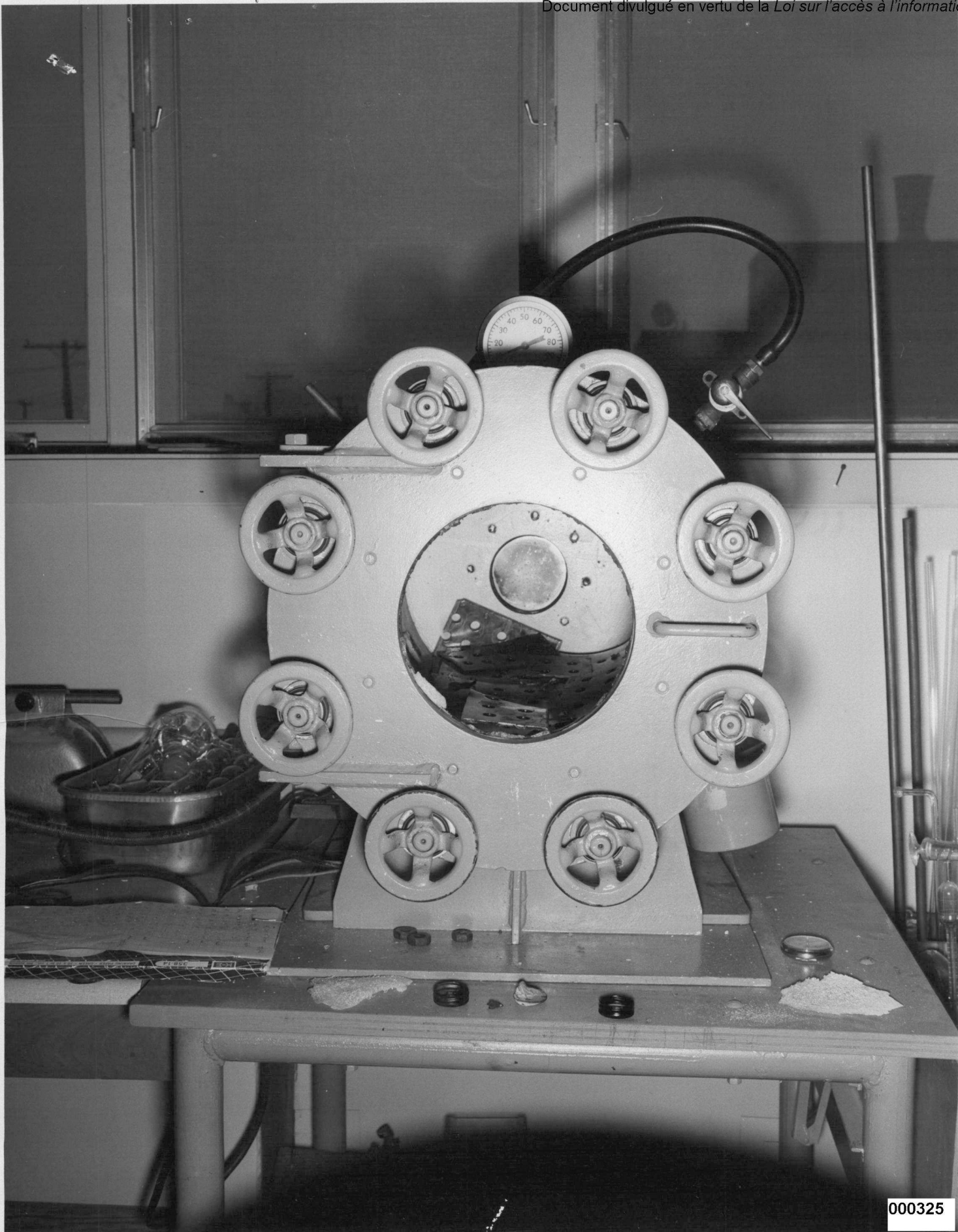


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Chamber - Left side from front.

Re Explosion in a high pressure  
Chamber. S.M.L. Stannicum bed.  
28-1-62

6231.3



Chamber Front View - Closed.

File # 105-2570 19 March 1962

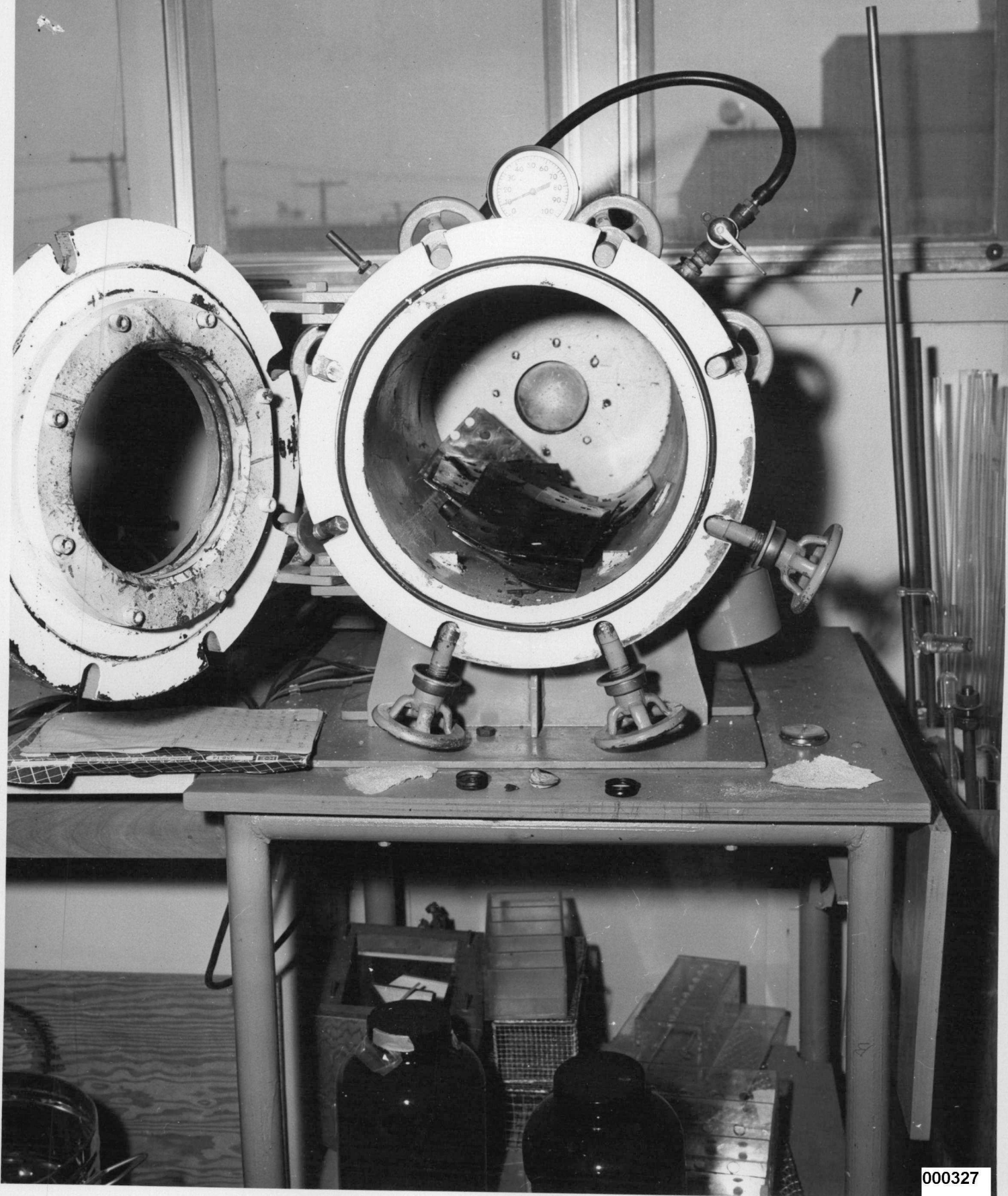
Re Explosion in a high pressure

Chamber M.M.L. Commission, Ont.

28-2-62

# 6231 ✓ 4





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Chamber Front View - open

Re Explosion in a high pressure  
Chamber. S.M.L. 28-2-62  
Sovmaviev. Put.

K 6231-6



000329

Ed. 105. 25/0. March 14, 1962

Re. Explosion in a high pressure  
Camber HML, Sonoma, Cal.  
28. 2. 62.

Images to East Main Windows

62-31-1





000331

File #105-1570 March 17, 1962

Re Explosion in a High pressure Chamber

SKM. Lennovian. Oct. 28-2-62

Damage to East wall windows.

6231-2



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File AFB. 105. 35/0 14 March 1962

Re Explosion in a high pressure

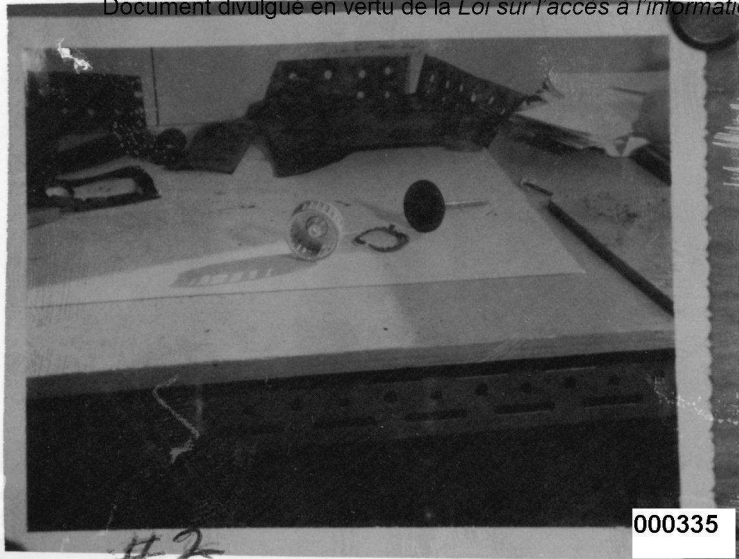
Chamber: L.M.H. Armstrong Bell

28. 3. 62.

Manager to North Hill

W 62 31-5





File 84B.105-25/0

March 19th 1962.

Re Explosion in a high  
pressure chamber SKMh. Downsview  
Ont. 28-3-62

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File. DKB. 105-25/0

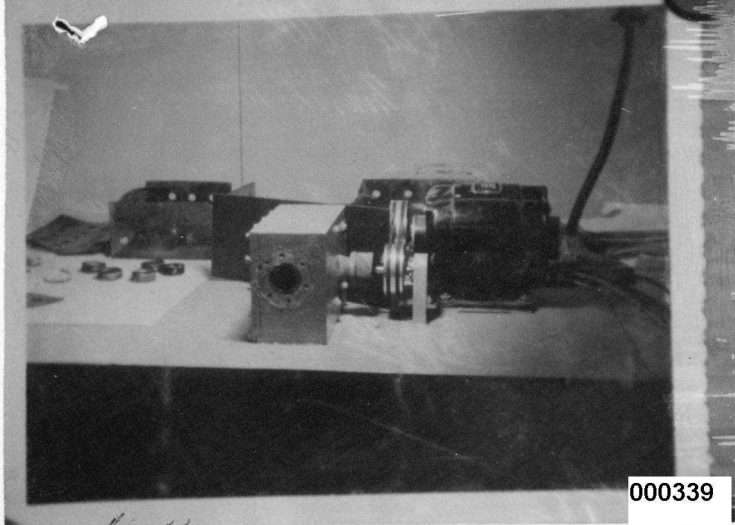
March 19th 1962

Re Explosion in a high

Pressure Chamber. L.M.L.

Sawmirew. Out. 28.3.62

000338



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File SHB 105-35/0

March 19th 1962

Re Explosion in a high pressure  
chamber RML. Dominion Post.

28-3-62

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POLAROID

PA - DRBC STACEY, Norman Edward  
DRB 105-1 (DGS)

SRB 105-25/0

Ottawa, Ontario,  
March 16, 1962.

Chief Supt.,  
D.R.M.L.

Report of Major Accident

STACEY, Norman Edward

1. Attached, in duplicate is Form GE.26 regarding an accident which Mr. Norman Edward Stacey had on February 28th.
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, Department of Labour.

Original Signed by  
C. A. WINSER

Att. 2  
CAW:ld

Chairman.

*Reply received dated  
6 April 1962 as above*

*[Handwritten signature]*

FILE  
NUMBER

DRB 105-25/0

DEPARTMENT OF NATIONAL DEFENCE

# ACCIDENTS

• DEFENCE RESEARCH ESTABLISHMENT TORONTO

• D.C.I. E-M

USE INSIDE COVER FOR CROSS REFERENCES

ROUTING				P. A. AND B. F. ENTRIES				REGISTRY ONLY	
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