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G-4	Insert	13 Mar 87	WCP						
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G-4	min ③	19/5/87	WCP	19 May	W				MAR 20/87
G-3	request	19/5/87	E	19 MAY	DR				20/5/87
G-4	B.F. - See flag	12/6/87	E	1 Jun					
EA Cond	Request	9/6/87	D	10/6/87	W				10 JUN 87
G-3	Request	12/6/87	P	14/6/87	Le				

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Mobile Command Force mobile

1011-1 (ADM)

Special Service Force Headquarters
Canadian Forces Base Petawawa
Petawawa, Ontario
K8H 2X3

26 April 1988

Distribution List

SALVAGE REPORT - CH135119

Reference: 1011-135 (SAMEO) 20 April 1988 (Enclosed)

Enclosed please find the Salvage Report for the crash of CH135119. Elements of your unit were involved in this salvage and the report is forwarded for your information.

A.K. Wong
Captain
for Commander Special Service Force

Enclosure: 1

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National Défense
Defence nationale

1011-135 (SAMEO)

427 Tactical Helicopter Squadron
Canadian Forces Base Petawawa
Petawawa, Ontario
K8H 2X3

20 April, 1988

Distribution List

SALVAGE REPORT - CH135119

Reference: C-05-010-002/AG-000

Please find enclosed the Salvage Report for the crash of CH135119.

P.G. Abbott
Major
for Commanding Officer

Enclosure(s): 1

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SALVAGE REPORT -CH135119

Reference: C-05-010-002/AG-000

PART 1 - GENERAL

INTRODUCTION

1. On 28 January 1988, a Canadian Forces Twin Huey helicopter CH135119 crashed 30 meters from the east shore of Byng Lake, Ontario, approximately 50 km SW of Timmins, Ontario. The aircraft crashed inverted in a heavily wooded area in deep snow. Wreckage was located along the intended flight path for a distance of 300 meters. The main rotor head and blades were located frozen to the surface of Byng Lake 85 meters from the crash site. The aircraft was destroyed on impact and partially consumed by fire.

AIM

2. The aim of this report is to outline the salvage operation of CH135119 which consisted of the removal of the wreckage, scattered debris and main rotor head from the crash site to a 40 foot flat bed trailer approximately 8 km away on the nearest road. This report outlines the difficulties encountered, personnel and equipment involved and includes a summary of the operation in accordance with the reference.

PART 2 - DISCUSSION

TERRAIN AND WEATHER

3. The salvage operation was conducted in harsh terrain under bitterly cold conditions. The main crash site and scattered wreckage were in a heavily wooded area with a snowfall of about 1 meter. Wreckage was found either suspended in trees or under 15 to 30 cm of snow. The temperature averaged -20 degrees Celcius with a wind chill factor often of -30 to -35 degrees Celcius. The main rotor head and stab bar assembly were frozen in 30 cm of slush and ice on the surface of Byng Lake. The lake was frozen with about 15 cm of ice but covered by a further 30 to 45 cm of slush. Working conditions on the lake were invariably wet, exposed and very cold.

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PERSONNEL INVOLVED

4. The salvage team consisted of Lt NL Saulnier (MOC 41A AERE) and Sgt D Schimpf (MOC 512 AF). Assistance was provided from 30 Jan 88 to 3 Feb 88 by the CFB North Bay Ground Search Team (1 x Capt, 1 x WO, 14 x NCM all trades) and after 3 Feb 88 by one troop from 2 Combat Engineering Regiment (2 CER) and four TAMS pers from 2 Service Battalion (2 Svc Bn). Personnel were available in sufficient numbers to conduct search and recovery operations.

EQUIPMENT REQUIRED

5. Due to the climate and isolated location a great variety of equipment was required. Unit resources provided some equipment (CH 135 support, tools, heaters, arctic survival eqpt, vehicles, etc), 10 TAG provided helicopter and other support, and Air Command provided most of the ground search team equipment and a 40 foot flat bed trailer. FMC provided the CER and TAMS personnel and equipment. Much miscellaneous equipment was locally purchased or borrowed from other government agencies (Timmins Fire Hall, OPP, Ministry of Natural Resources and local militia regiments). Annex A lists the equipment used.

DIFFICULTIES ENCOUNTERED

6. Four major difficulties were encountered during the salvage operation. These consisted of the isolation at the site, the environment, the salvage of the main rotor head, and transportation.

7. The crash occurred in an isolated site geographically distant from military facilities. The support base, CFB North Bay, was 370 km away while the unit of ownership, 427 Sqn, CFB Petawawa, was 600 km away with travel times by road of 5 and 8 hours respectively. This initially presented logistic problems however these were resolved through cooperation from CFB North Bay, CFB Petawawa, and Air Command.

8. Cold temperatures, wind, slush and lack of readily available medical facilities presented potentially serious health hazards throughout the operation. It was often necessary to work for extended periods without gloves or with only thin gloves while sifting through or identifying wreckage. Salvage of the main rotor head required pers to work with legs and arms in slush and water. To counter these difficulties the 'buddy system' was used extensively and a heated five man arctic tent was continuously maintained. An HF radio link was established with Timmins

through CFB Trenton and a CH 135 could usually be despatched within 30 minutes. During all chainsaw operations a CH 135 was maintained as casevac standby at the crash site.

9. The salvage of the main rotor head and stab bar assemblies presented unique problems as these two assemblies were frozen in the ice and slush on Byng Lake. Field Engineers from 2 CER recovered these assemblies by cutting the ice with axes, picks and chainsaws. The main rotor blades were cut from the hub then lifted in a block of ice. The hub and stab bar were recovered in a similar fashion.

10. Transportation presented problems throughout the operation. The only land access to the site was along 40 km of logging roads and 8 km of snow mobile trails. The land voyage required 4 to 5 hours each way. The only feasible method of moving personnel, equipment and wreckage was by helicopter airlift. The assistance of TAMS pers was essential in the preparation of loads for slinging. All loads were flown 8 km to the road junction and packed on the 40 foot flat bed trailer. The wreckage was shipped to QETE, Hull for further investigation.

SLINGING OPERATIONS

11. All sections of wreckage with the exception of the main rotor blades were slung by CH 135 from the crash site to the road junction. A total of 10 sorties was required to transport wreckage and a final 3 sorties for the assorted TAMS and CER equipment. Although heavy logs were lashed to the tail boom section this load still proved to be very unstable. The main rotor blades were lashed to tobaggans and dragged to the road junction by snowmobiles.

PART 3 - SUMMARY

SUMMARY OF THE SALVAGE OPERATION

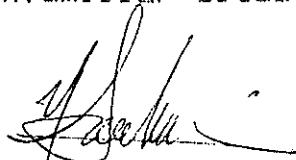
12. The salvage of CH135119 proceeded smoothly and was accomplished in a minimum of time due to the cooperation received from many agencies. All located wreckage was removed from the site however most wreckage was obscured by snow and many pieces were not found. It will almost certainly be necessary to return to the crash site in warmer weather to complete the recovery.

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RECOMMENDATIONS

13. It must be emphasized that this recovery was successful due the cooperation received from many units. Problems that seem insurmountable in recovery operations may often be resolved with ease by specialized units. Officers faced with future recovery operations should not hesitate to seek assistance when faced with unfamiliar situations.



N.L. Saulnier
Lieutenant
427 Sqn Salvage Officer

Attachments:

Annex A - Equipment List

Annex B - Photographs of Salvage Operation

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ANNEX A TO
SALVAGE REPORT - CH135119

EQUIPMENT LIST

The following is a list of the major equipment required at the crash site:

<u>Description</u>	<u>Quantity</u>	<u>Source</u>
<u>Survival Equipment</u>		
5 man arctic tent	1	CFB North Bay
Yukon stove	1	CFB North Bay
Coleman lantern	2	CFB North Bay
Coleman stove	2	CFB North Bay
Folding Metal Cots	5	CFB North Bay
HF radio	1	CFB North Bay
POL		Local Purchase
Rations, juice, water		Local Purchase
Thermal food containers	3	Ontario Ministry of Natural Resources (MNR)
<u>Transportation</u>		
MLVW HIAB	1	427 Sqn Petawawa
40 foot flat bed trailer	1	CFB North Bay
5 ton truck	1	Local Rental
Toboggan	2	2 CER Petawawa
Snow machine tracked	4	2 from 2 CER Petawawa 2 from Ont MNR
<u>Salvage Equipment</u>		
Field tool kit (F Kit)	1	427 Sqn Petawawa
CH135 Special Tool Kit	1	427 Sqn Petawawa
Herman Nelson heater	1	427 Sqn Petawawa
Bolt cutters	1	427 Sqn Petawawa
Prying bar	1	427 Sqn Petawawa
Gun tape (rolls)	5	427 Sqn Petawawa
Brushes (sifting wreckage)	5	427 Sqn Petawawa
Shovel	4	CFB North Bay
Axe	4	CFB North Bay
Pick	2	CFB North Bay
Wood pallet	10	CFB North Bay
Tri-wall	5	CFB North Bay
Compass	10	CFB North Bay

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ANNEX A TO
SALVAGE REPORT - CH135119

<u>Description</u>	<u>Quantity</u>	<u>Source</u>
Ice auger	2	CFB North Bay
Bubble wrap (large roll)	1	CFB Petawawa
Bubble wrap (small roll)	3	CFB Petawawa
Cardboard box, small	30	CFB Petawawa
Bag plastic, self sealing	100	CFB Petawawa
Chainsaw	4	2 CER Petawawa
Block & tackle	1	2 CER Petawawa
Bouy	1	2 CER Petawawa
Rope	300 M	2 CER Petawawa
Oxy acetelene torch	1	2 CER Petawawa
Life jacket	5	2 CER Petawawa
CCCl container	10	2 Svc Bn TAMS Petawawa
Steel sling	5	2 Svc Bn TAMS Petawawa
Mesh cargo sling	5	2 Svc Bn TAMS Petawawa
Pendant, slinging	3	2 Svc Bn TAMS Petawawa
Snowshoes	10	Local Militia
Mukluks & liners	20	Local Militia
Combat overboot	20	Local Militia
Garbage bags	20	Local Purchase
Plastic tarpaulin	2	Local Purchase
Fire extinguisher (suitable to -40°C)	2	Timmins Fire Hall
Map of lake bed	1	Ont MNR
Hip waders	2	Ont MNR
Chainsaw (36 inch bar)	1	Ont MNR

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO #1 - AERIAL PHOTOGRAPH OF MAIN CRASH SITE

Note tail boom visible lower left corner. Forward and Aft Fuselage sections visible centre left.

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 2 - MAIN CRASH SITE VIEWED LOOKING AFT

Note dense forest and new snowfall. Centre fuselage section almost totally consumed by fire. Tail boom and aft fuselage section retain sufficient integrity for slinging.

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION

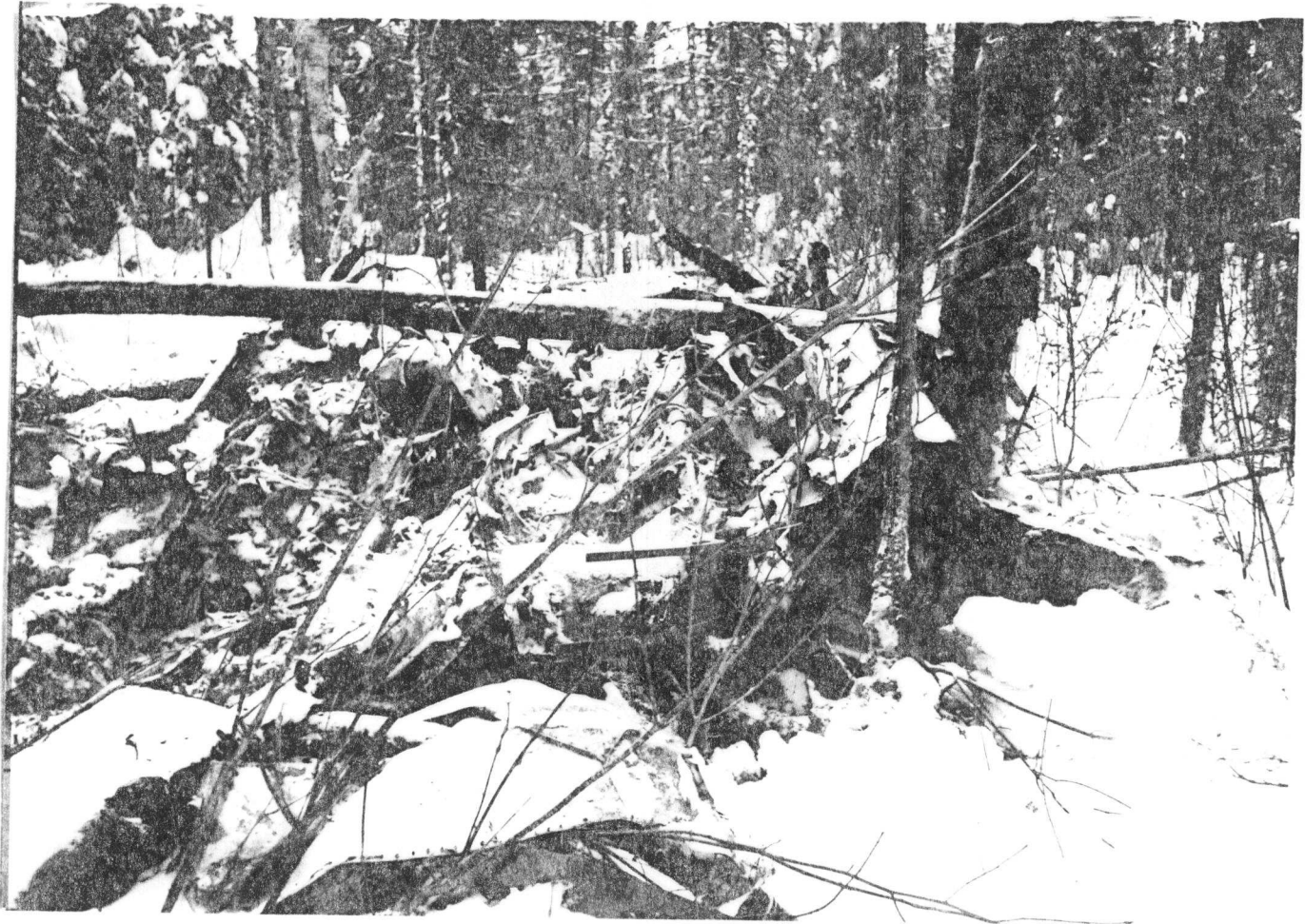


PHOTO # 3 - MAIN CRASH SITE VIEWED LOOKING FORWARD

General destruction of forward fuselage section is evident. This section was rolled onto a steel sling for transportation.

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 4 - REMOVAL OF LOOSE DEBRIS

Before slinging operations could commence all loose wreckage was removed, packaged, and identified as applicable.

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 5 - AFT FUSELAGE SECTION

Aft fuselage section as prepared by TAMS pers for slinging.

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION

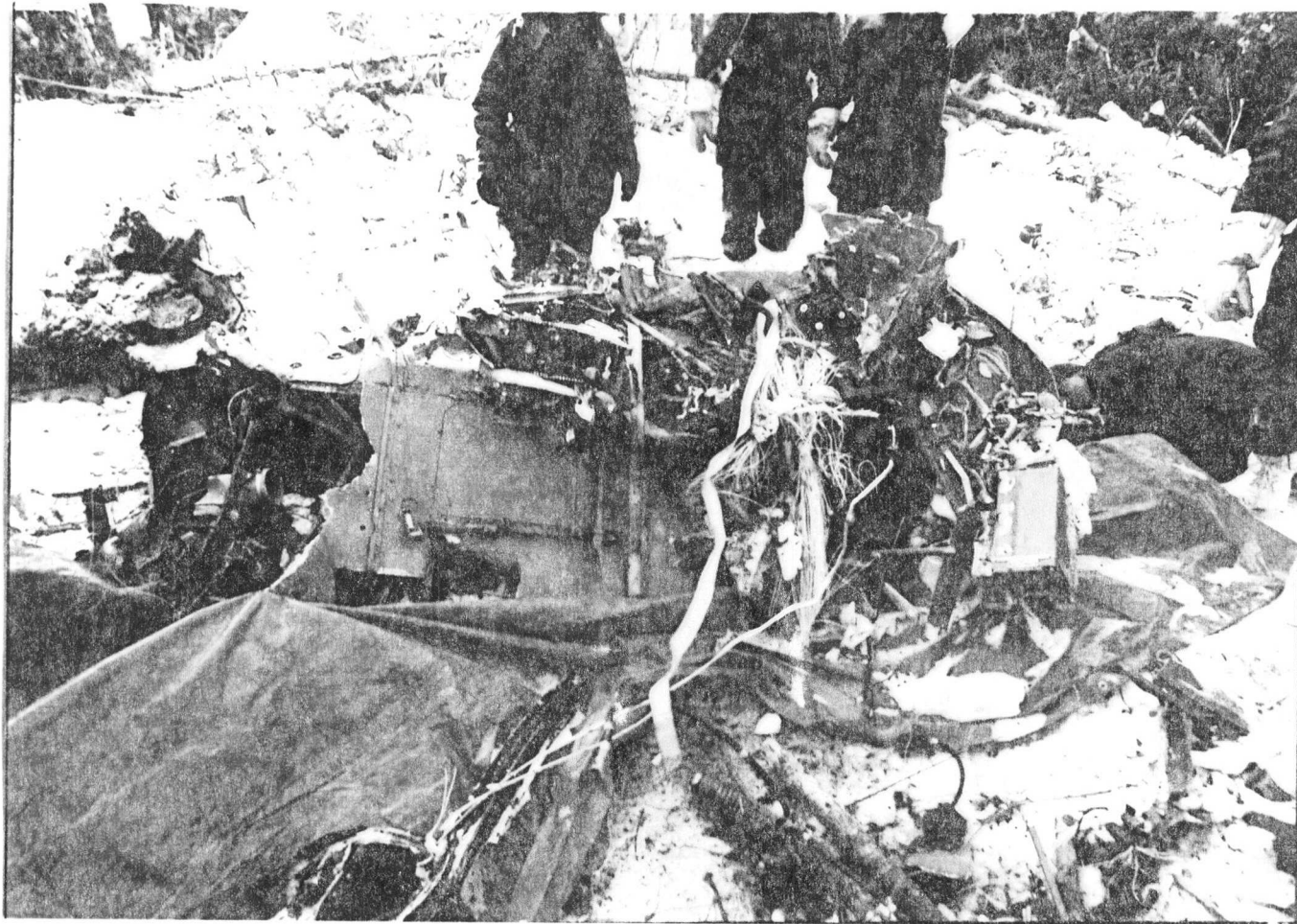


PHOTO # 6 - FORWARD FUSELAGE SECTION

Forward fuselage section after having been rolled onto steel sling and plastic tarp by CER and TAMS pers.

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ANNEX B TO
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PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 7 - REMOVAL OF TAIL BOOM

Tail boom was carried 30M to lake to ease slinging operations. Note some trees have been felled to permit slinging.

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PHOTOGRAPHS OF SALVAGE OPERATION

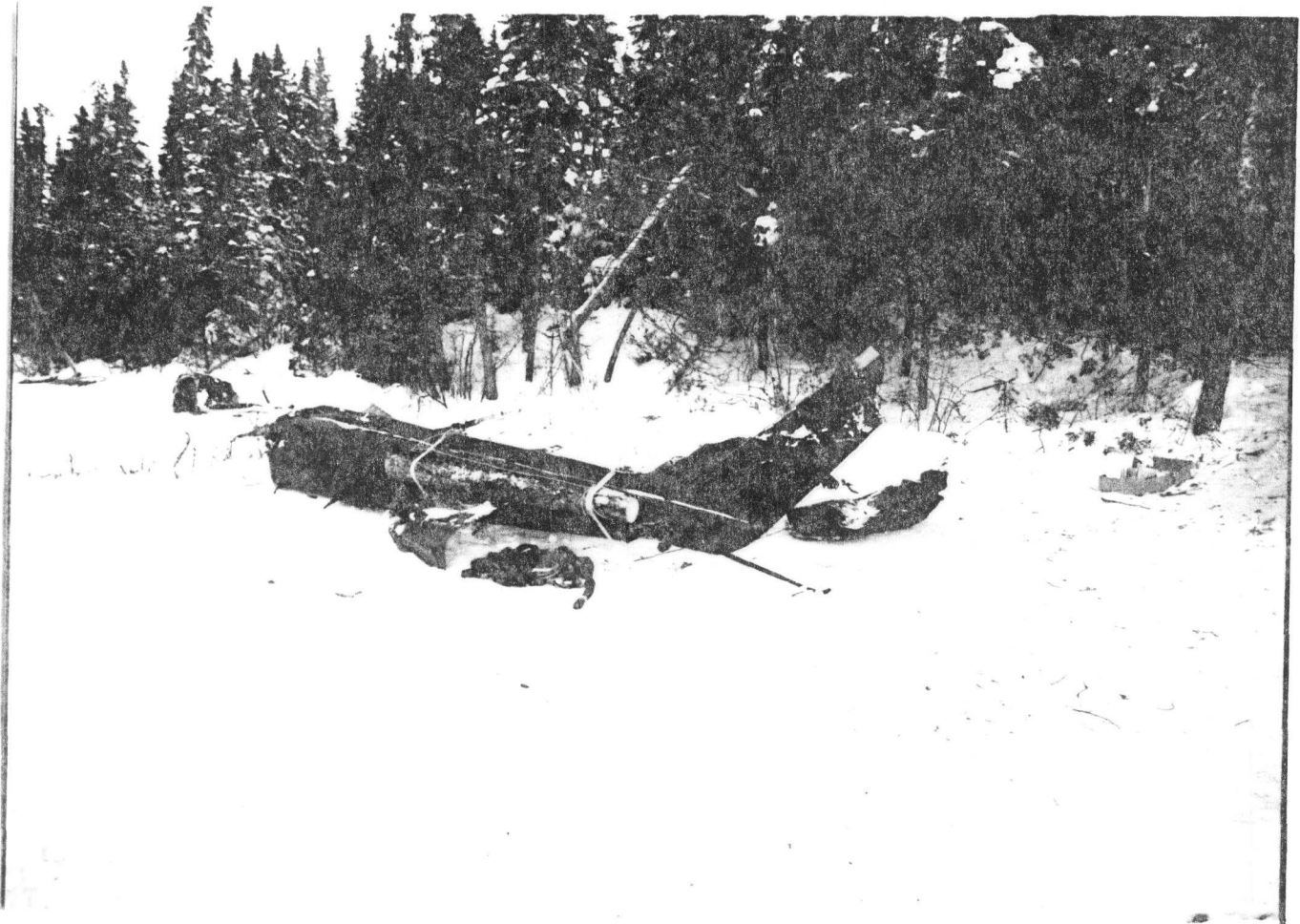


PHOTO # 8 - PREPARATION OF TAIL BOOM FOR SLINGING

Note addition of logs to each side of tail boom to increase weight and stability.

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ANNEX B TO
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PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 9 - SLINGING OF TAIL BOOM

Note CCC1 containers and tri-walls prepared for slinging.

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ANNEX B TO
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PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 10 - SLINGING OF FORWARD FUSELAGE SECTION

The weight of the forward and aft fuselage sections prevented them from being carried to the lake. These two sections were slung directly from the main crash site

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 11 - SEARCH FOR WRECKAGE BY GROUND SEARCH TEAM

Note depth of snow and clothing worn. Most wreckage was found under 15-30cm of snow. The ground search team conducted a search for at least 400M in all directions.

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 12 - CUTTING OF MAIN ROTOR BLADES

Note safety line and hoisting clevis attached to main rotor hub (centre).
Note long pole under drag brace to support assembly in case of cracking
ice.

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION



PHOTO # 13 - RECOVERY OF MAIN ROTOR BLADES

Note life jackets, safety line to shore, orange marker bouy and two pers on right wearing hip waders. Stab bar assembly is visible at centre of photograph. Shattered main rotor blade is visible beyond bouy. The remaining blade and hub are frozen in ice.

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ANNEX B TO
SALVAGE REPORT - CH135119

PHOTOGRAPHS OF SALVAGE OPERATION

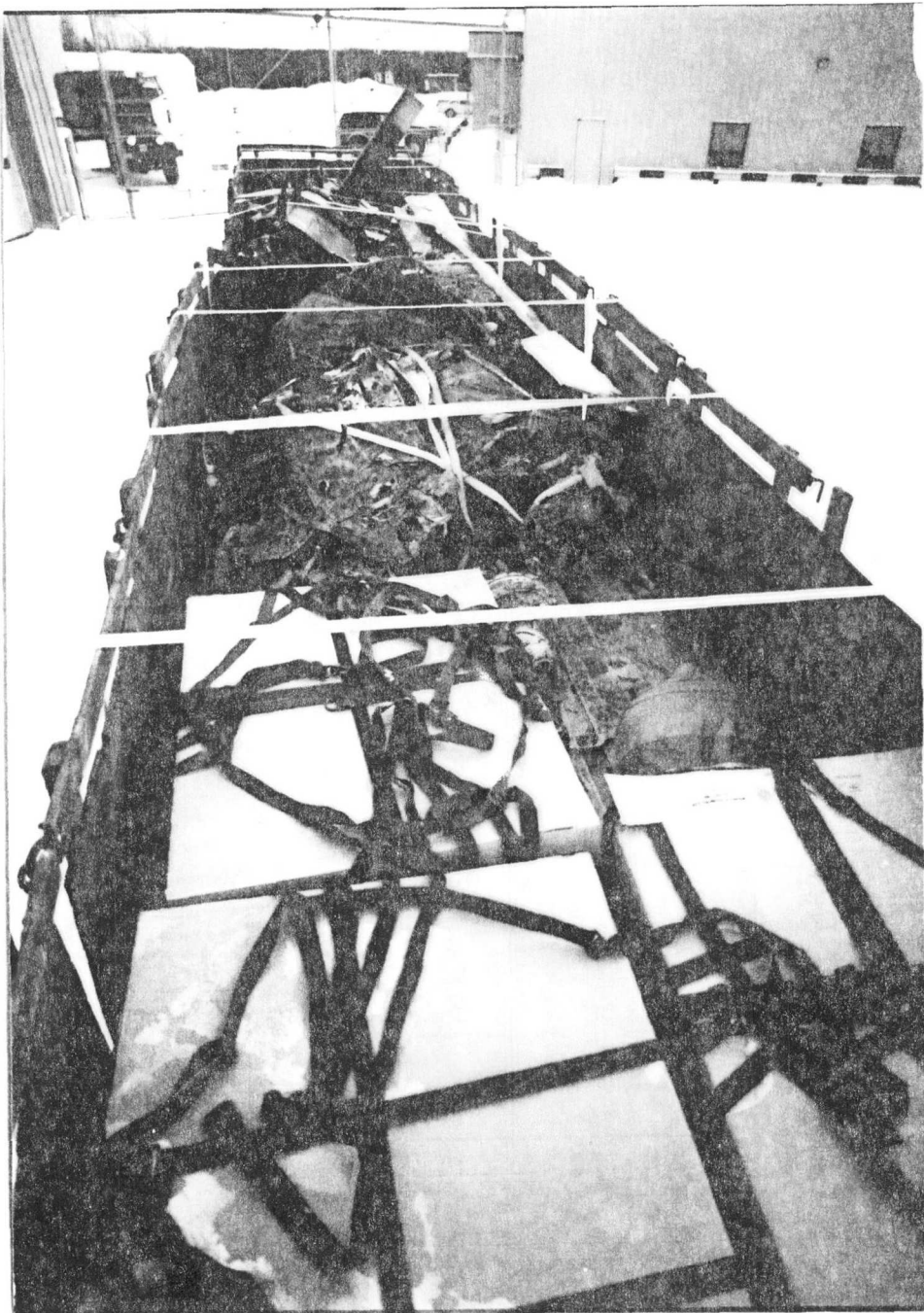


PHOTO # 14 - VIEW OF LOADED FLAT BED TRAILER

CCC7 and tri-walls are visible in foreground, aft and forward fuselage sections are visible at centre with tail boom at left rear and rotor blades right rear.