



DOI FY 06 Aviation Mishaps



**4 Aircraft
Accidents**

**The loss of
one life**



**One serious,
and three
minor injuries**

**12 Incidents
with Potential**





DOI FY 06 Aviation Mishaps



The National Transportation Safety Board

NTSB 831.13 Flow and dissemination of accident or incident information.

(b) ... Parties to the investigation may relay to their respective organizations information necessary for purposes of prevention or remedial action.

... However, no (release of) information... without prior consultation and approval of the NTSB.

**This information is provided
for accident prevention purposes only**



Fairbanks, AK

October 6, 2005



Husky A-1B

Mission

Resource Clinic

Training

Damage

Substantial

Injuries

None

Procurement

Fleet

NTSB ID

ANC06TA002





Fairbanks, AK

October 6, 2005



Issues

Mission briefing

Cockpit
communications

Distraction

Crew Selection

Training standards
and program
objectives





NTSB Probable Cause Fairbanks, AK, October 6, 2005



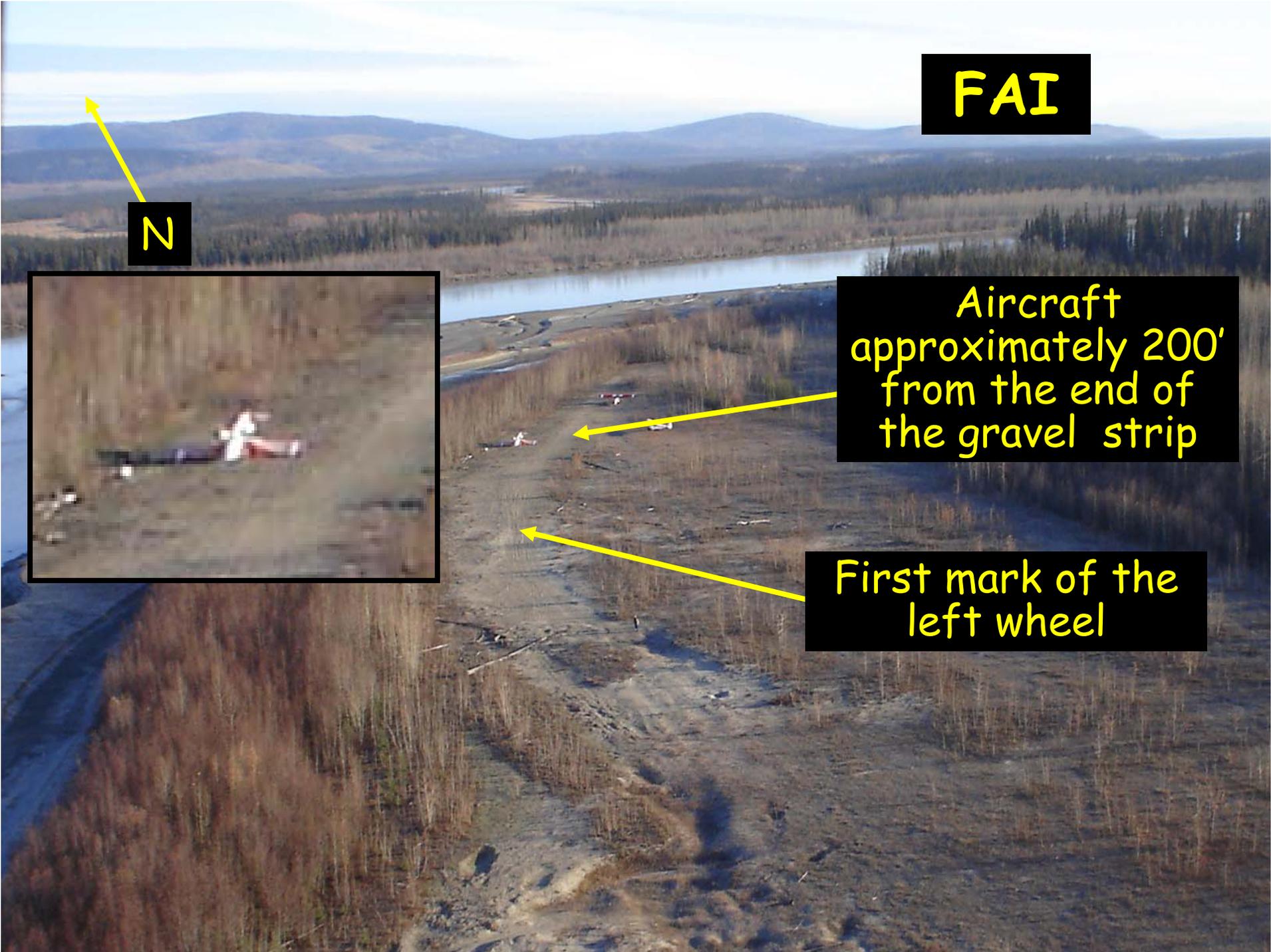
The National Transportation Safety Board

The National Transportation Safety Board determined that the probable cause of this accident was ...



Probable Cause

“The flight instructor's inadequate supervision of the dual student during the landing roll, which resulted in the dual student applying the brakes excessively, and the airplane nosing over. A factor associated with the accident was the excessive braking by the dual student.”



N

FAI

Aircraft
approximately 200'
from the end of
the gravel strip

First mark of the
left wheel

Reenactment during recovery

Damage to vertical
fin and roof



**Wings and vertical fin
slightly twisted**





Discussion





DOI FY 06 Aviation Mishaps



5Ms

Man ...

Man, Machine, and Media interact to produce a successful Mission or, sometimes, an unsuccessful one.

<http://afpalco.kqaf.mil>

Machine ...

There is significant overlap between Man, Machine, and Media, because these elements interrelate directly, but the critical element is

Media ...

Management because it defines how the other elements interact...

Mission ...

Management ...

7. ORM Integration	9
8. Benefits	9

Management is often the controlling factor in mission success or failure.



Escalante, UT

December 14, 2005



Aerospatiale SA 319B
Aoulette

Mission

Passenger Transport
& Resource Recon

Damage

Substantial

Injuries

1 Serious
3 Minor

Procurement

ARA

NTSB ID

SEA06TA028





Escalante, UT

December 14, 2005



Aerospatiale SA 319B
Aoulette

Mission

Passenger Transport
& Resource Recon

Damage

Substantial

Injuries

1 Serious

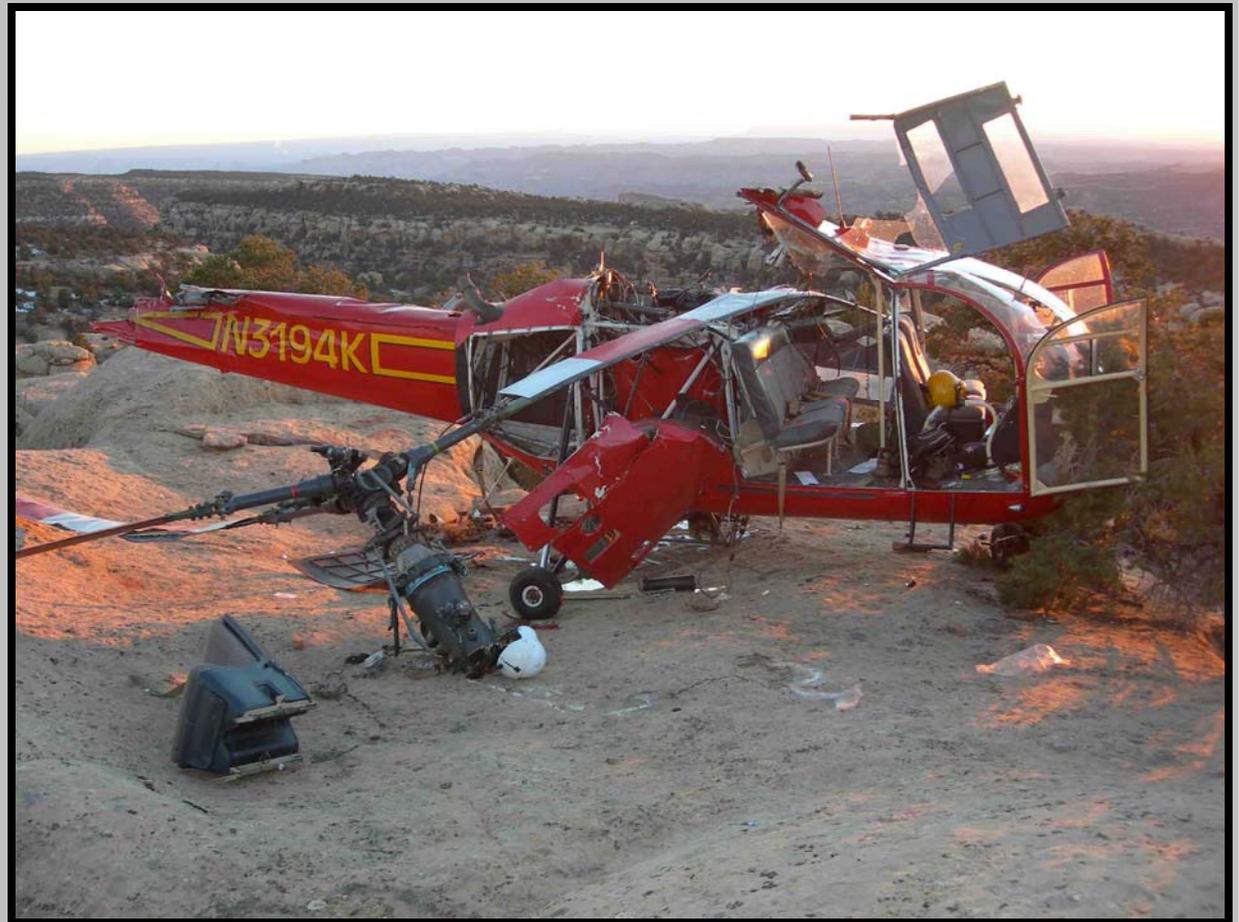
3 Minor

Procurement

ARA

NTSB ID

SEA06TA028





NTSB Probable Cause Escalante, UT, December 14, 2005



The National Transportation Safety Board

The National Transportation Safety Board determined that the probable cause of this accident was ...

Probable Cause

"The pilot's inadequate remedial action when ground resonance was encountered during landing.

Contributing factors were the rough/uneven terrain and company inadequate maintenance."





Escalante, UT

December 14, 2005



Issues

Project planning

Mission creep

Managing risks

ALSE

Hazard reporting

Maintenance
problems

Aircraft and pilot
carding



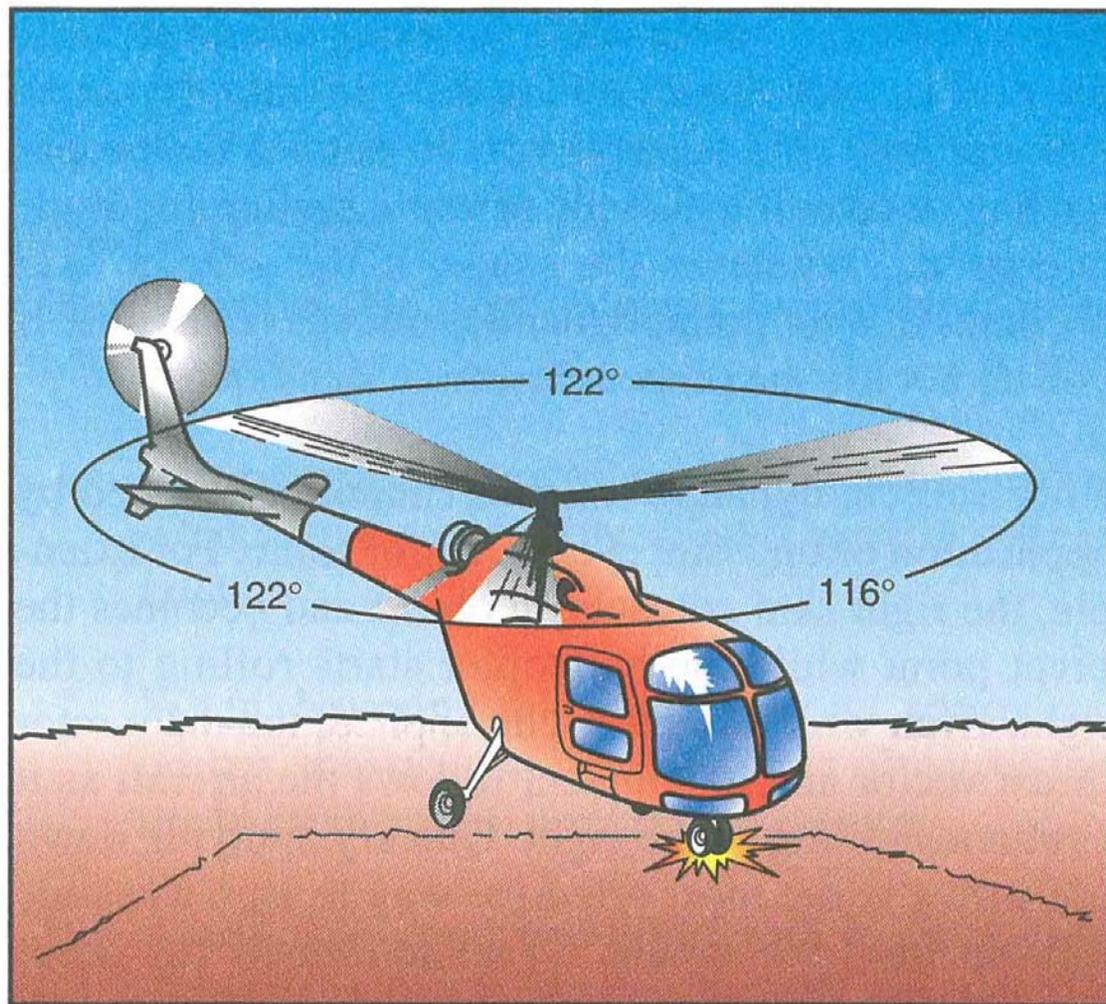


Figure 11-5. Hard contact with the ground can send a shock wave to the main rotor head, resulting in the blades of a three-bladed rotor system moving from their normal 120° relationship to each other. This could result in something like 122° , 122° , and 116° between blades. When one of the other landing gear strikes the surface, the unbalanced condition could be further aggravated.



Escalante, UT

December 14, 2005



Man

Pilot was carded

Pilot recognized
ground resonance

- Failure to repair
- Failure to report
- Improperly
maintained key
components

Pilot's selection of
landing area

Inappropriate
recovery





Escalante, UT

December 14, 2005



Machine

Improper maintenance

- Owner/Operator
- Mechanic/DoM

Key components

- Tires (underinflated)
- Struts (overinflated)
- Dampner (very weak)

FAA certification and oversight





Escalante, UT

December 14, 2005



Media

Weather not a factor in accident

- Clear and cool
- 10+ miles vis
- 7100' MSL
- Light winds

Landing area risks

- General risks
- Uneven surface





Escalante, UT

December 14, 2005



Mission

Feral Cattle Eradication

- Phase I
- Phase II
- Use of helicopter
- Unit/Field Office management
- Helicopter Manager
- Passengers





Escalante, UT

December 14, 2005



Management

Project Aviation Safety Plan

Failure to involve
senior Bureau
Aviation Managers

Lack of SAFECOMs

ALSE





Escalante, UT

December 14, 2005



Management

Project Aviation Safety Plan

- Not updated
- Not signed
- Aviation Risk Assessment (ORM)

Local management's
SA of risk level
(medium risk syndrome)

Failure to involve
senior Bureau
Aviation Managers





Escalante, UT

December 14, 2005



Management

Lack of SAFECOMs

Decision to transport
personnel at night

ALSE

- Helmets
- Boots
- Repair issues





Escalante, UT

December 14, 2005



Management

Load Calculation

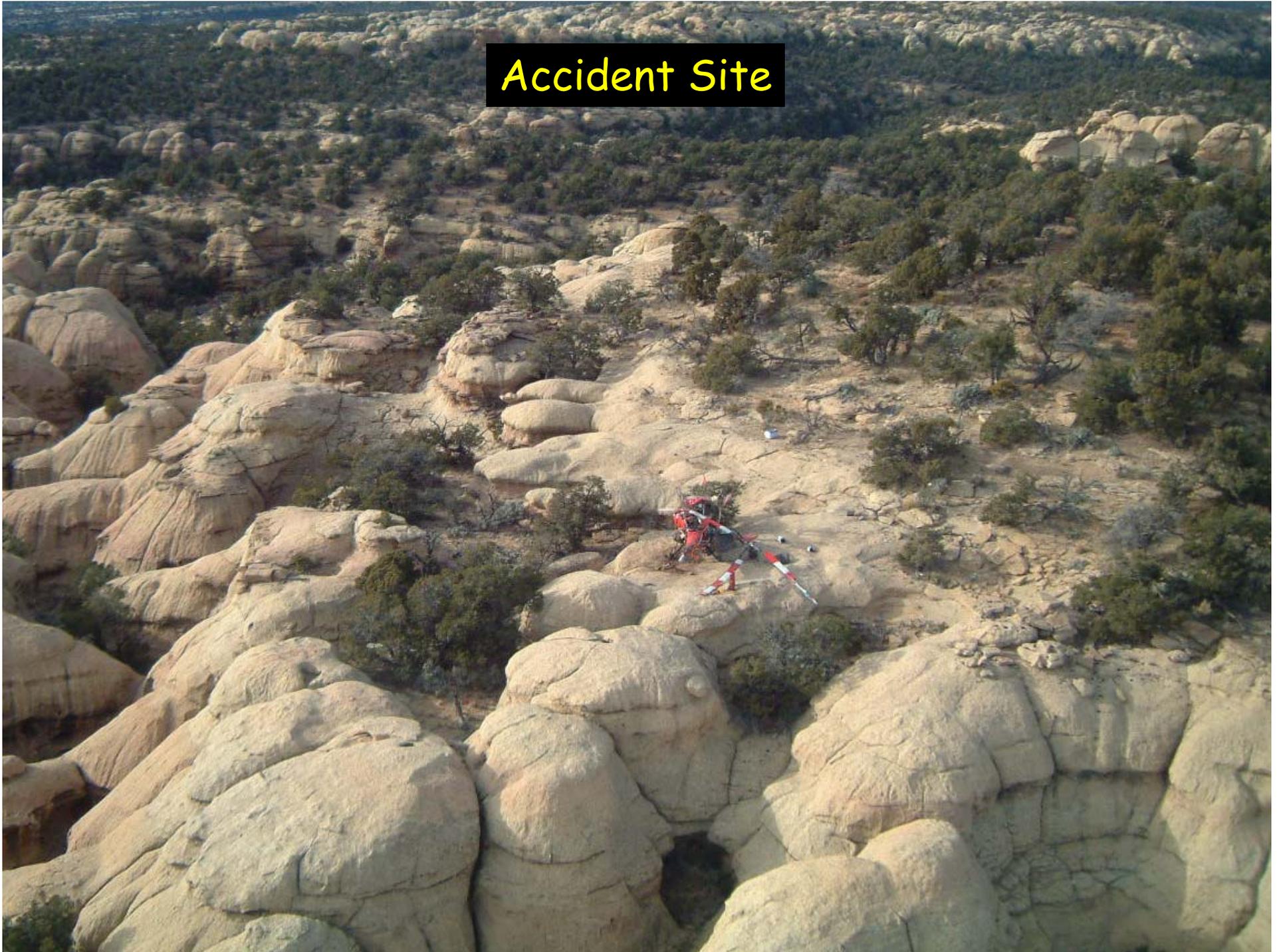
- Aircraft did NOT exceed GW or performance limits
- Several errors with load calc
 - Dated two days before accident
 - Not initially available
 - GW in error
 - Addition error



Overview of Accident Site



Accident Site





The rotor blade struck all four passengers





Proper Use of Flight Helmets saved 4 lives
Left Outboard Passenger



**Proper Use of Flight Helmets saved 4 lives
Left Inboard Passenger**



Proper Use of Flight Helmets saved 4 lives
Right Inboard Passenger



**Proper Use of Flight Helmets saved 4 lives
Right Outboard Passenger**



Proper Use of Flight Helmets saved 4 lives
Right Outboard Passenger



Proper Use of Flight Helmets saved 4 lives
Right Outboard Passenger

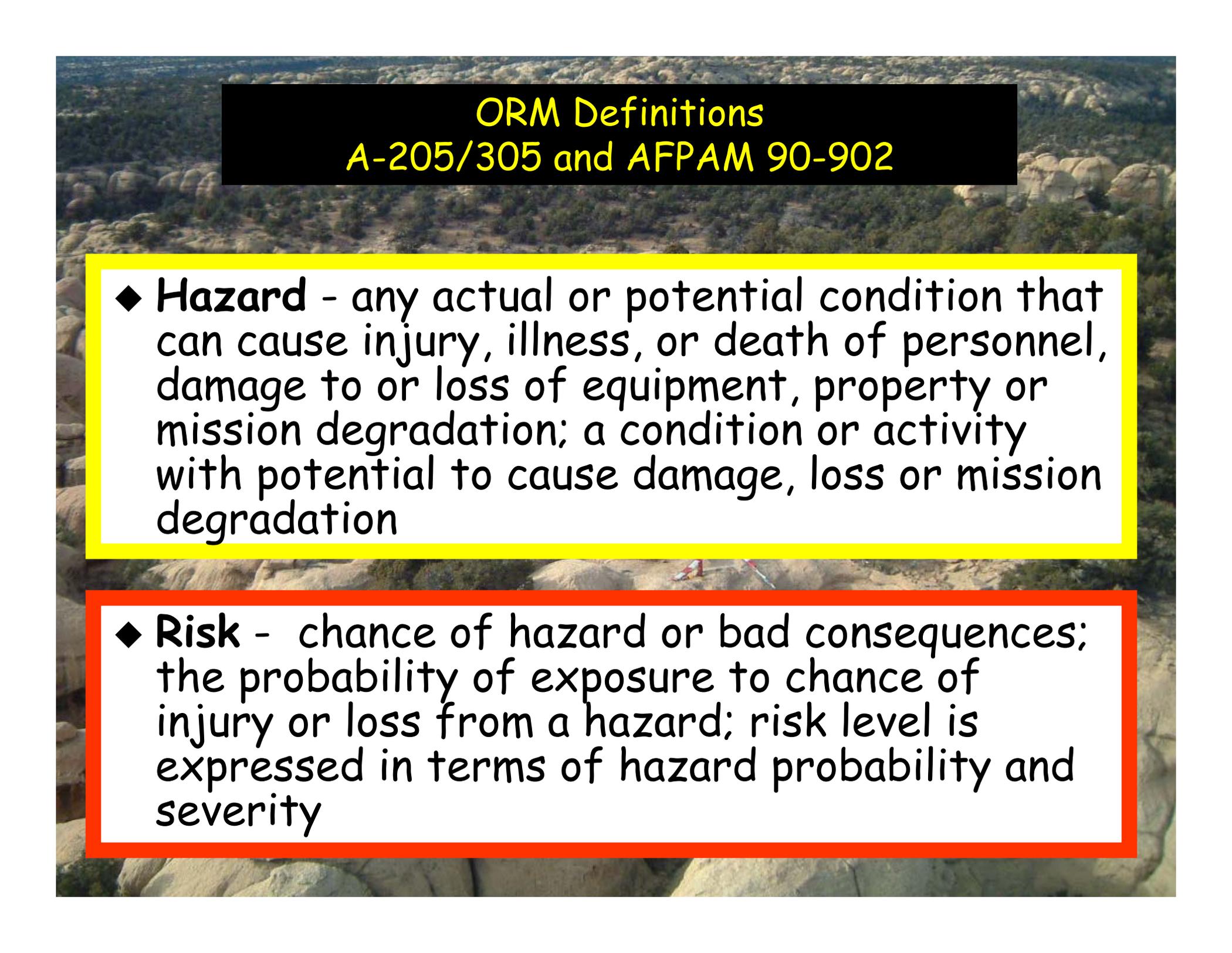


Proper Use of Flight Helmets saved 4 lives
Right Outboard Passenger









ORM Definitions A-205/305 and AFPAM 90-902

◆ **Hazard** - any actual or potential condition that can cause injury, illness, or death of personnel, damage to or loss of equipment, property or mission degradation; a condition or activity with potential to cause damage, loss or mission degradation

◆ **Risk** - chance of hazard or bad consequences; the probability of exposure to chance of injury or loss from a hazard; risk level is expressed in terms of hazard probability and severity

Pre-accident Aviation Risk Assessment

November 9, 2005

AVIATION RISK ASSESSMENT WORKSHEET

Assess the risks involved with the project. List the hazards and their associated risks. List the mitigation measures if necessary. Line Officer Designee Signature Required **Risk Approval Level**

Describe Hazard: _____ Probability: _____ Effect: _____ Risk: _____
 Pre-Mitigation hazards rate out as: High (A-F) (I-IV) Level

Hazard Risk Assessment Code		Appropriate Management Level for go/no-go decision	
Risk Level		Fire	Project
I-A, I-B, II-A	EXTREMELY HIGH	Incident commander or Operations Section Chief.	Line Manager
I-C, I-D, II-B, II-C, III-A	HIGH	Incident commander or Operations Section Chief	Line Manager
I-E, II-D, III-B, III-C, IV-A	MEDIUM	Air Operations Branch Director	Forest Aviation Officer/ Unit Aviation Manager

4. Ensure personnel are wearing appropriate PPE for their job i.e. Flight suit or fire clothes, flight or leather gloves, eye protection, hearing protection, leather boots etc.

Approved By (Line Officer or Designee): _____ Title: _____ Date: 11/10/05

Discussion





Busby, MT

August 3, 2006



Bell 206 L1-C30P

Mission

Fire Reconnaissance

Damage

Substantial

Injuries

None

Procurement

Exclusive Use

NTSB ID

SEA06TA153





NTSB Probable Cause Busby, MT, August 3, 2006



The National Transportation Safety Board

The National Transportation Safety Board determined that the probable cause of this accident was ...

Probable Cause

“The improper overhaul of the turbine assembly by maintenance personnel, which resulted in failure of the turbine and a total loss of engine power.

A contributing factor was the pilot's misjudgment of the landing flare at the termination of the autorotation.”





Busby, MT

August 3, 2006

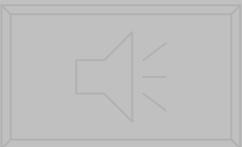


Issues

Material failure of engine - NOT due to pilot or vendor

Excellent post-accident response by local unit

Flight helmets and four-point shoulder harnesses contributed to lack of injuries





Busby, MT
August 3, 2006



Man

Properly carded

Highly experienced
seasonal pilot

Recognition and
reaction to the
engine failure

Landing area
selection and
touchdown
technique





Busby, MT

August 3, 2006



Machine

Vendor maintenance
personnel replaced
turbine section 13
hours before
accident

Teardown analysis
determined
fatigue failure of
a #2 turbine
wheel blade

Shoulder harnesses
likely prevented
serious injury





Busby, MT

August 3, 2006

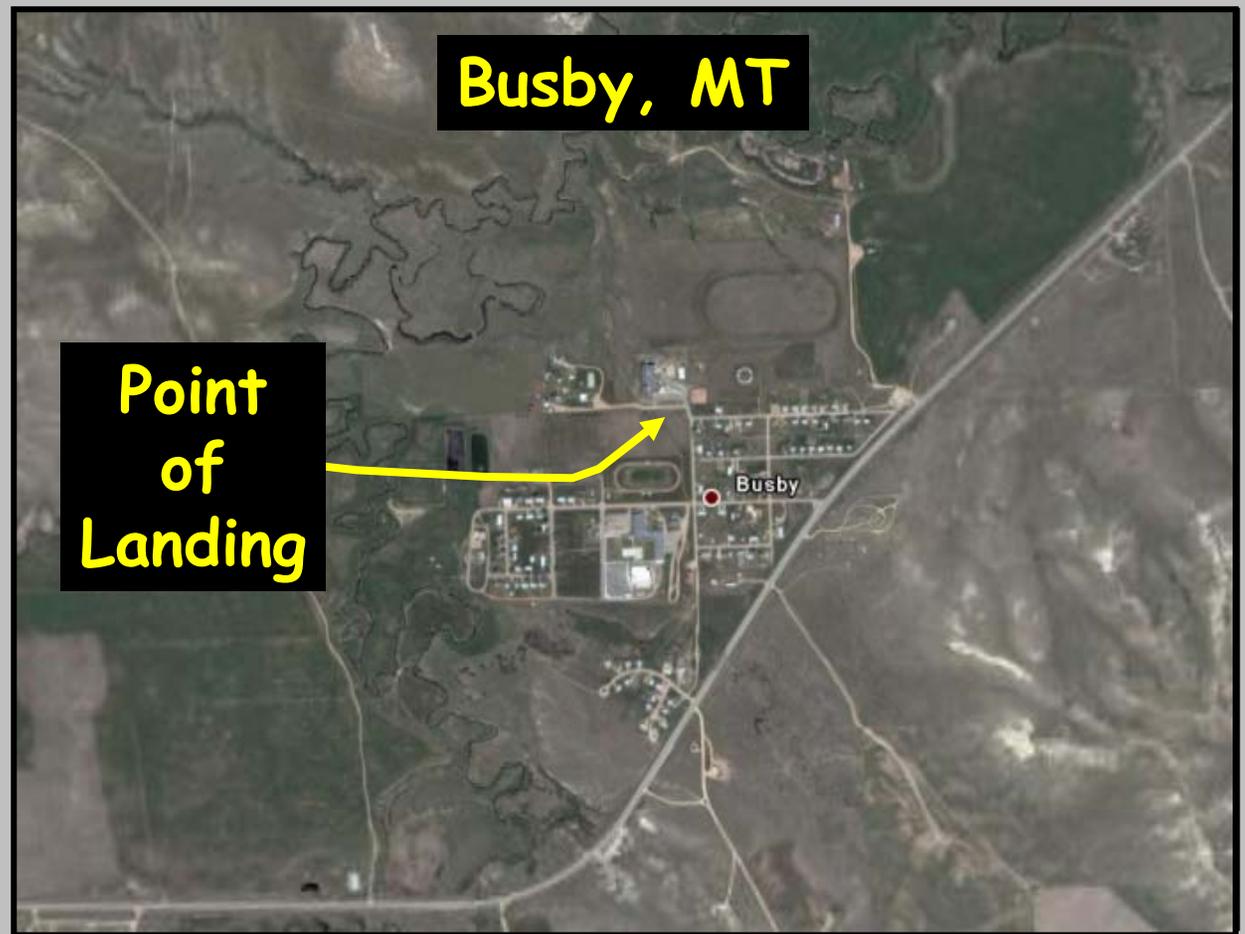


Media

Weather not a factor in accident

Landing area risks

- General risks
- Numerous good areas within gliding distance





Busby, MT

August 3, 2006



Mission

Fire reconnaissance

- Pilot plus three passengers

Power Assurance Check

- 8,000 MSL
(5,000 AGL)
- 90 Kts
- Climbing





Busby, MT

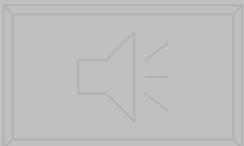
August 3, 2006



Management

EXCELLENT reaction
to the accident

- Initial response
- Notification
- Senior leader involvement
 - Local BIA
 - Acting National Aviation Program Manager

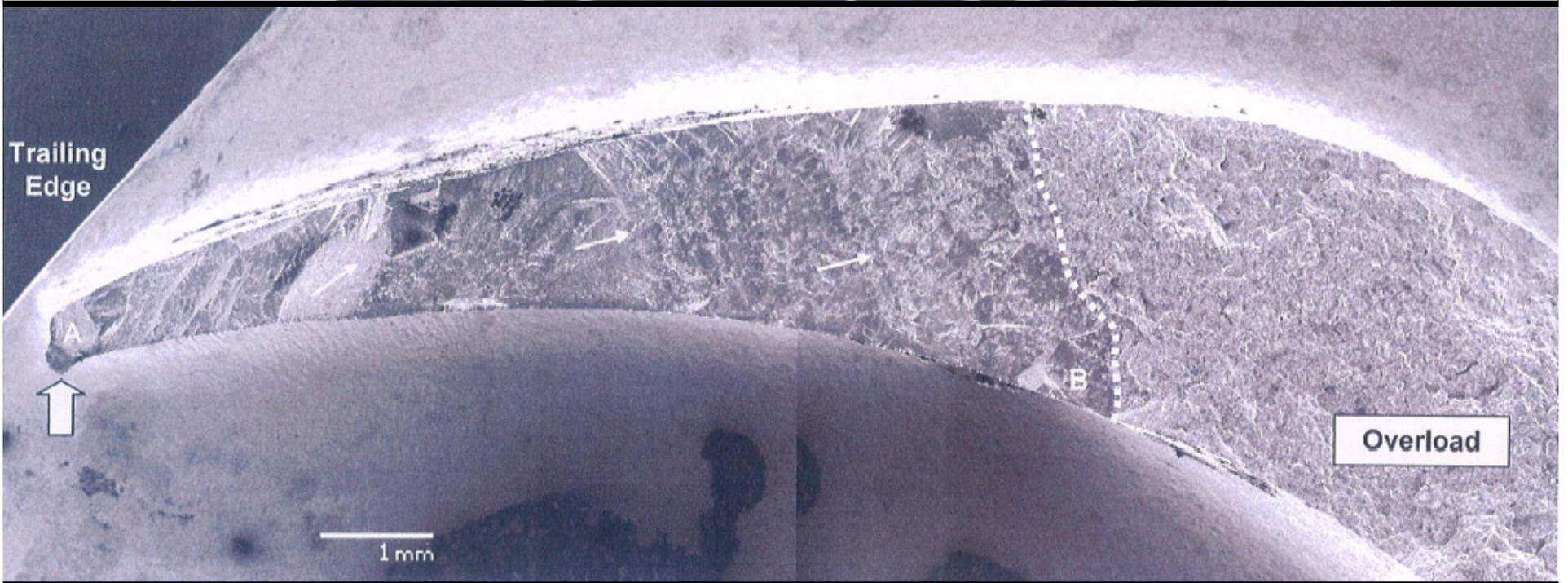
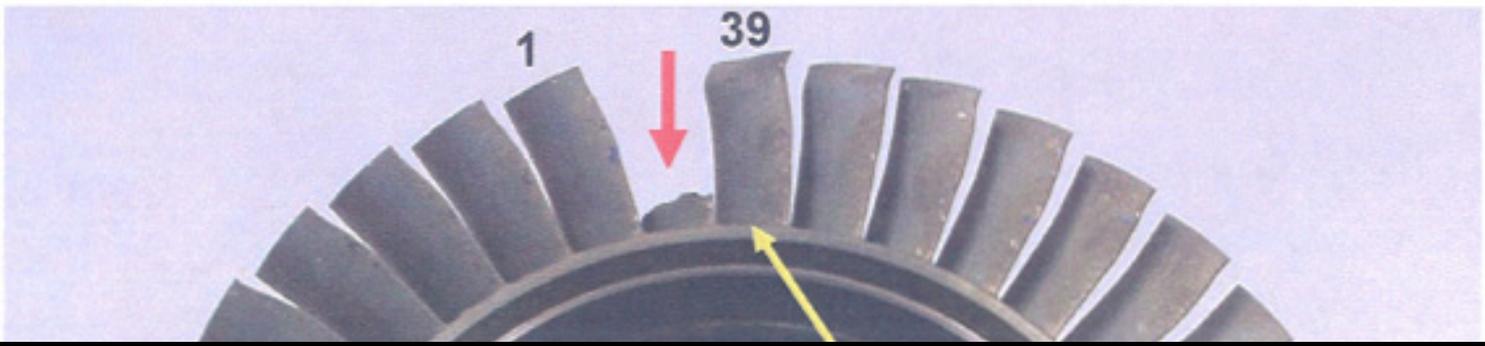


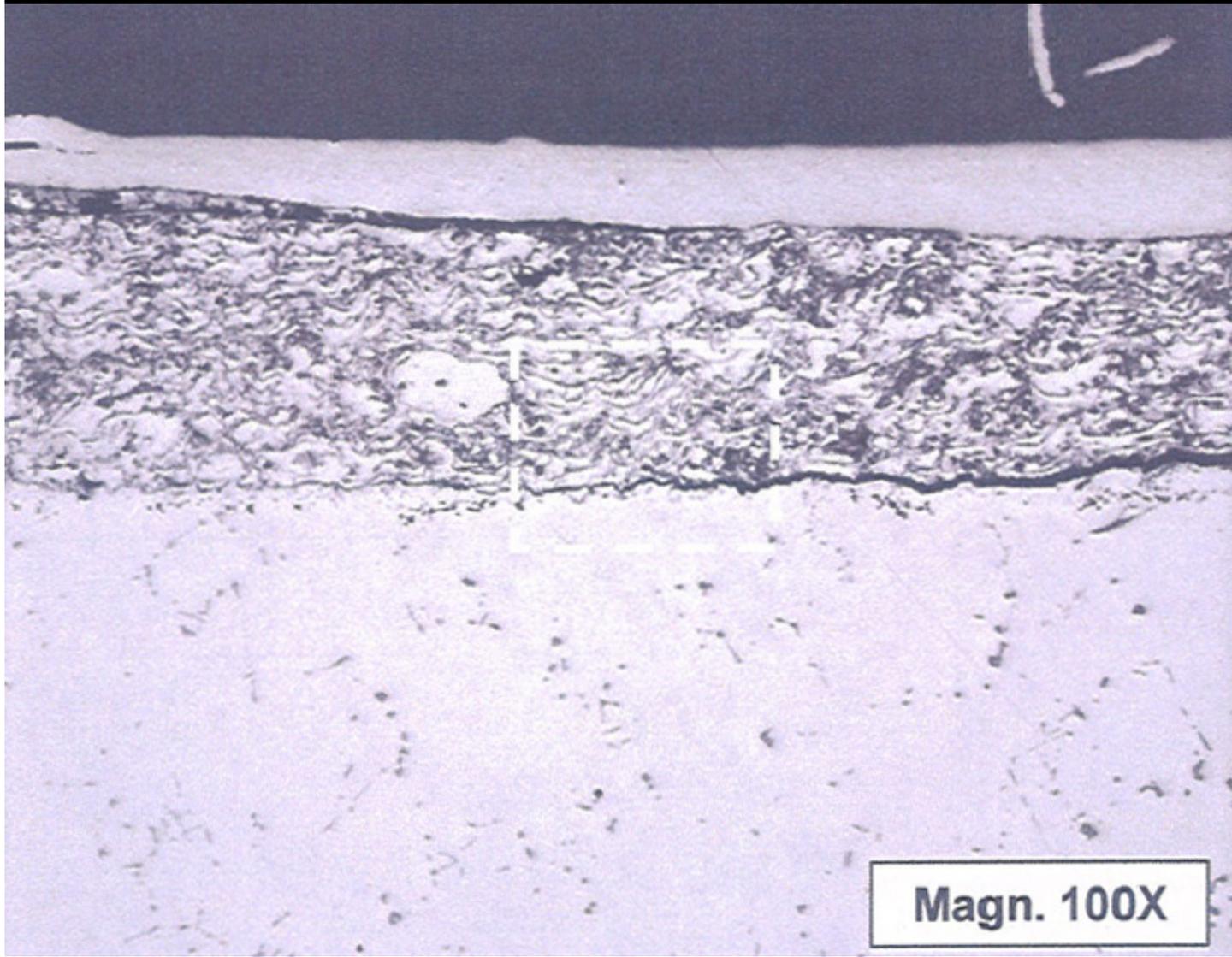
Overview of Accident Site



Damage to Power Turbine Section







**Second Stage
Turbine Wheel
Material**

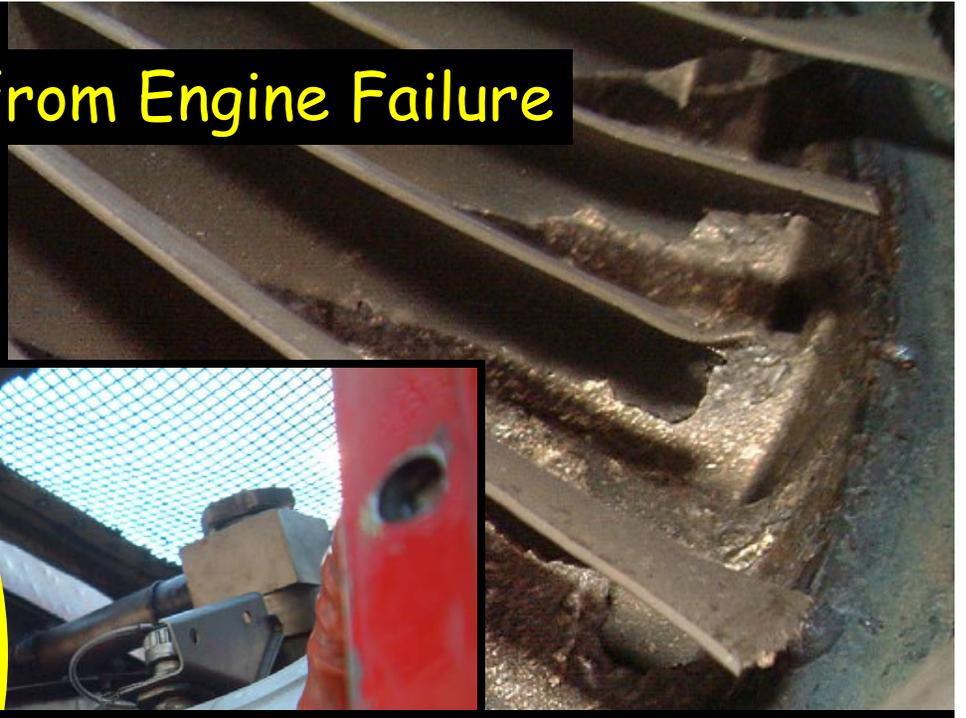
Thermal Spray

Base Metal

Magn. 100X

Magn. 20X

External Damage from Engine Failure



Evidence of Main Rotor Impact on Tailboom



Damage to landing gear suggests greater than 10 G's



4-point shoulder harnesses prevented serious injury



AMSAFE

AM-SAFE, Inc.
Phoenix, AZ USA (602) 850-2850

PNR 501819-427-1028
MFR 0FWE1
DMF 08/01/05

ASSY: 206 SERIES
S/ASSY
SN 2234 OH-58

M/NUM 501815-2 FAA/PA
C/PNR 206-919-201
Conforms To: BHT
BCAR Q4-4
CAA AR-161



RATED 1500 LBS.
REPAIR BY AM-SAFE ONLY

Discussion





Nuiqsut, AK

August 21, 2006



Aerospatiale AS 350-B2

Mission

Resource / Cargo
Transport

Damage

Destroyed

Injuries

1 Fatal

Procurement

Exclusive Use

NTSB:

ANC06GA121





NTSB Probable Cause Nuiqsut, AK, August 21, 2006



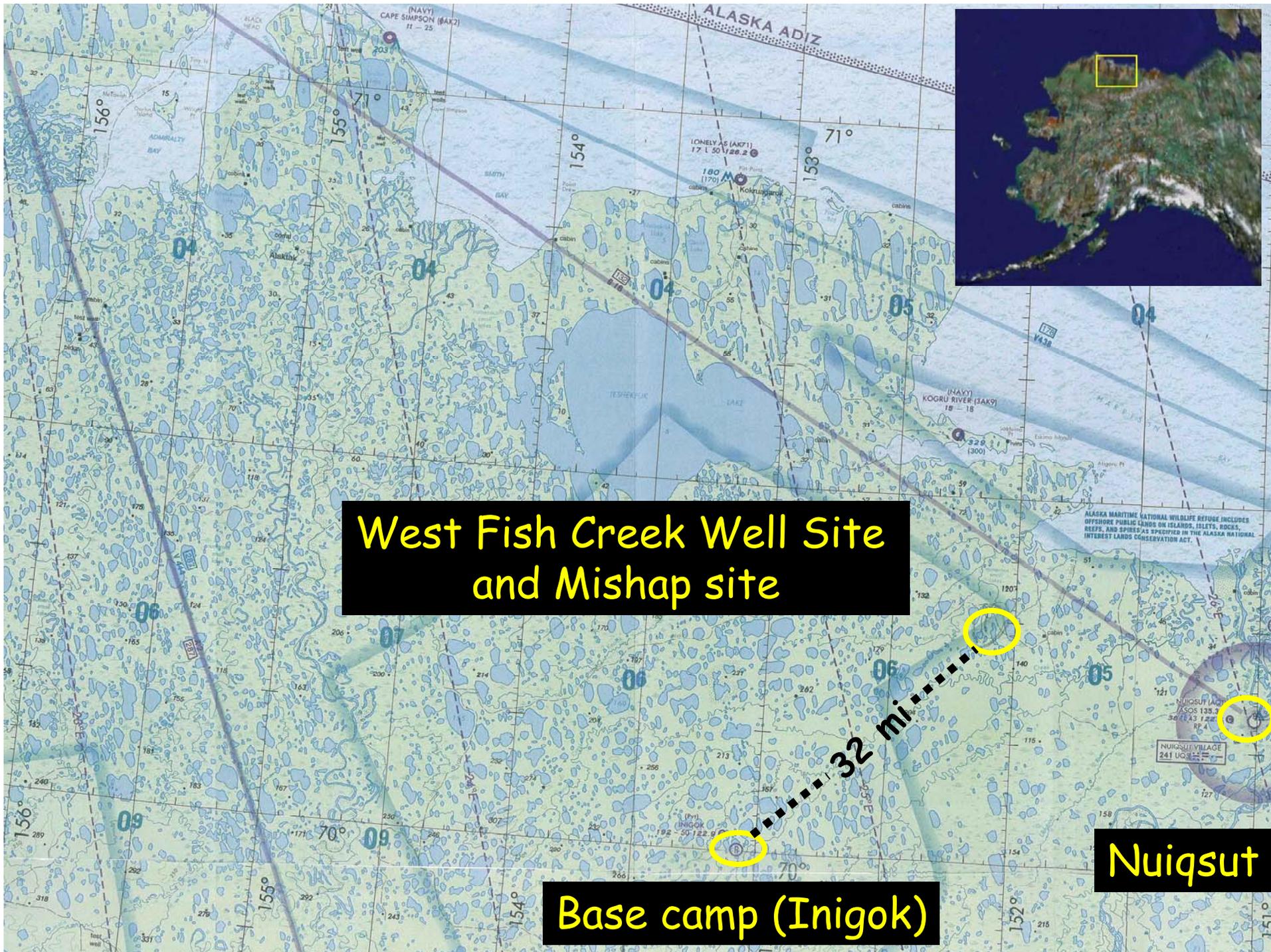
The National Transportation Safety Board

The National Transportation Safety Board determined that the probable cause of this accident was ...

Probable Cause

“The pilot's failure to maintain clearance from the sling load during cruise flight, which resulted in the load becoming entangled in the tail rotor, and an in-flight loss of control.”







Nuiqsut, AK

August 21, 2006



Issues

Managing risks

Management
Oversight

Lax Discipline

Stress and Fatigue

Flight Following

Weather

Pilot qualification
and carding





Nuiqsut, AK

August 21, 2006



Man

Pilot was carded

Replacement pilot

No Alaska experience

No prior sling
experience
(<5 hours at carding)

Not instrument
rated

All A-Star time on
Grand Canyon tours





Nuiqsut, AK

August 21, 2006



Man

Failed initial AMD
checkride

- confined areas
- mountain operations
- sling loads
- judgment

Contested by vendor

Passed second
checkride

- Director, ARO on
board as observer
- Pilot met minimum
Practical Test
Standards





Nuiqsut, AK

August 21, 2006



Man

Stress

- Pilot didn't adjust well to camp life
- Normally up until 2300-0100 hrs and slept in until 1000 hrs
- Looked forward to getting out of the field
- Had been told that the next day he might be leaving Inigok





Nuiqsut, AK

August 21, 2006



Man

Stress

- Tent fire at 0400 hours, Aug 9 destroyed pilot's belongings
- Pilot lost clothing, wallet, credit cards, pilot cards, and boots
- Pilot flew 0.7 hrs that day and 5.1 hrs over the next two days in hiking shoes
- Days off on Aug 11





Nuiqsut, AK

August 21, 2006



Machine

No recent
maintenance issues

Emergency Locator
Transmitter (ELT)
was armed but did
not aid in locating
wreckage

AFF was key in
locating the
accident site and
the investigation





Nuiqsut, AK

August 21, 2006



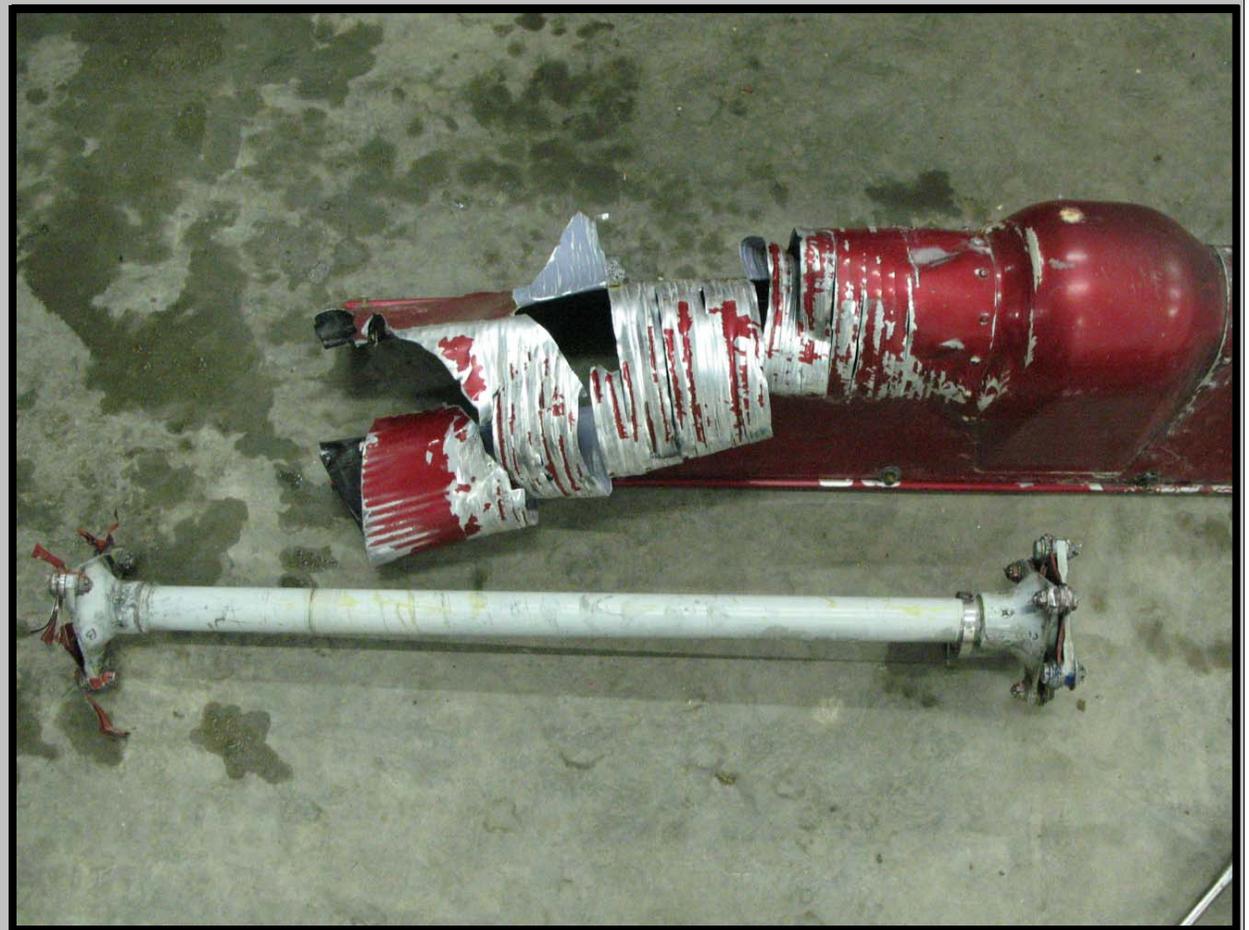
Machine

Evidence that the engine was running at the time the tail boom separated

No evidence of any aircraft systems failures

Cargo hook was functional

Cargo hook undamaged, but attaching hardware bent





Nuiqsut, AK

August 21, 2006



Machine

Lead line was not attached to the cargo hook and was found with the cargo net

One "purse string" was pulled out of the eyelet





Nuiqsut, AK

August 21, 2006



Medium

Lowest ceilings and visibilities in mornings and evenings

Best conditions in the afternoons

Immediately prior, a passenger reported patchy fog and deteriorating conditions returning from West Fish Creek





Nuiqsut, AK

August 21, 2006



Medium

Weather observations at Nuiqsut (24 miles east)

1828 hrs

400 Overcast
10 mi visibility
41°F (temp)
39.2 °F (dewpoint)

1853 hrs

200-400 Fog
1.25-2.5 mi visibility
39.2°F (temp)
37.4 °F (dewpoint)

1920 hrs (*accident*)

200 Fog
1.25-6 mi visibility
37.9°F (temp)
37.9 °F (dewpoint)





Nuiqsut, AK

August 21, 2006



Mission

Joint use BLM-USGS
field project

BLM site manager

BLM helicopter
manager

Mishap flight to
slingload waste
from old USGS
project to prepare
for new USGS
project

USGS provided
payment for flight
services to BLM





Nuiqsut, AK

August 21, 2006



Management

- No load calcs
- No manifests
- No hook checks
- No daily diary
- No helitack or manager at hook up point

Generally lax discipline and failure to identify and manage risks by field personnel





Nuiqsut, AK

August 21, 2006



Management

Flight following

- VHF radio and antenna
- Sat phone not compatible with aircraft avionics
- Pilot frequently failed to phone in (no SAFECOM)
- Camp did not have pilot's sat phone number
- AFF available but not monitored





Nuiqsut, AK

August 21, 2006



Management

Living conditions

- at least 17 years at Inigok
- no permanent structures
- only common area with heat was cook tent
- lack of heat in individual tents
- Unsafe heat in weatherport tents





Nuiqsut, AK

August 21, 2006



Management

ALSE

- Pilot frequently chose to not wear flight gloves (no SAFECOM)
- Pilot wore shoes rather than boots for two days after tent fire (no SAFECOM)
- Pilot not wearing gloves or shoulder harness at time of the accident





Nuiqsut, AK

August 21, 2006



Management

Crash Plan

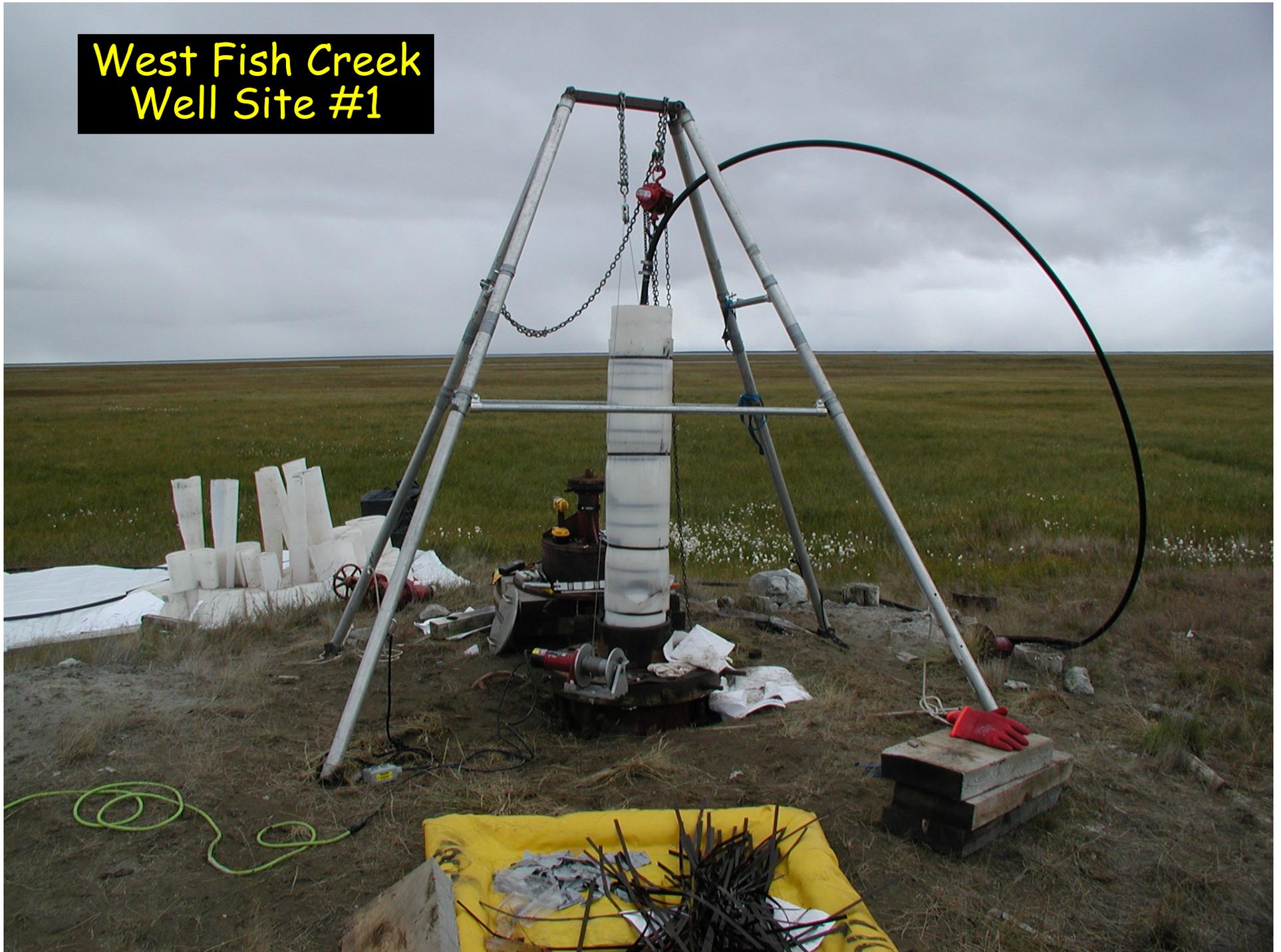
- Personnel not aware of location of crash kit at Inigok helibase
- Excerpt of IAMRG & CL
- Good flight log
- Didn't have pilot's sat phone number
- AICC initially notified 2+25 after takeoff (fuel exhaustion 1+45)



West Fish Creek
Well Site #1

Departed Base camp (Inigok) at 1853 hrs

West Fish Creek Well Site #1



**West Fish Creek
Well Site #1**



**Material carried
in cargo net**

Cargo at West Fish Creek Well Site #1



Arrive 1911 hrs

Depart 1916 hrs

AFF hit at 1918 hrs
31 kts, 200 ft, 129°

West Fish Creek
Well Site #1

Last AFF hit at 1920 hrs
47 kts, 302 ft, 325°

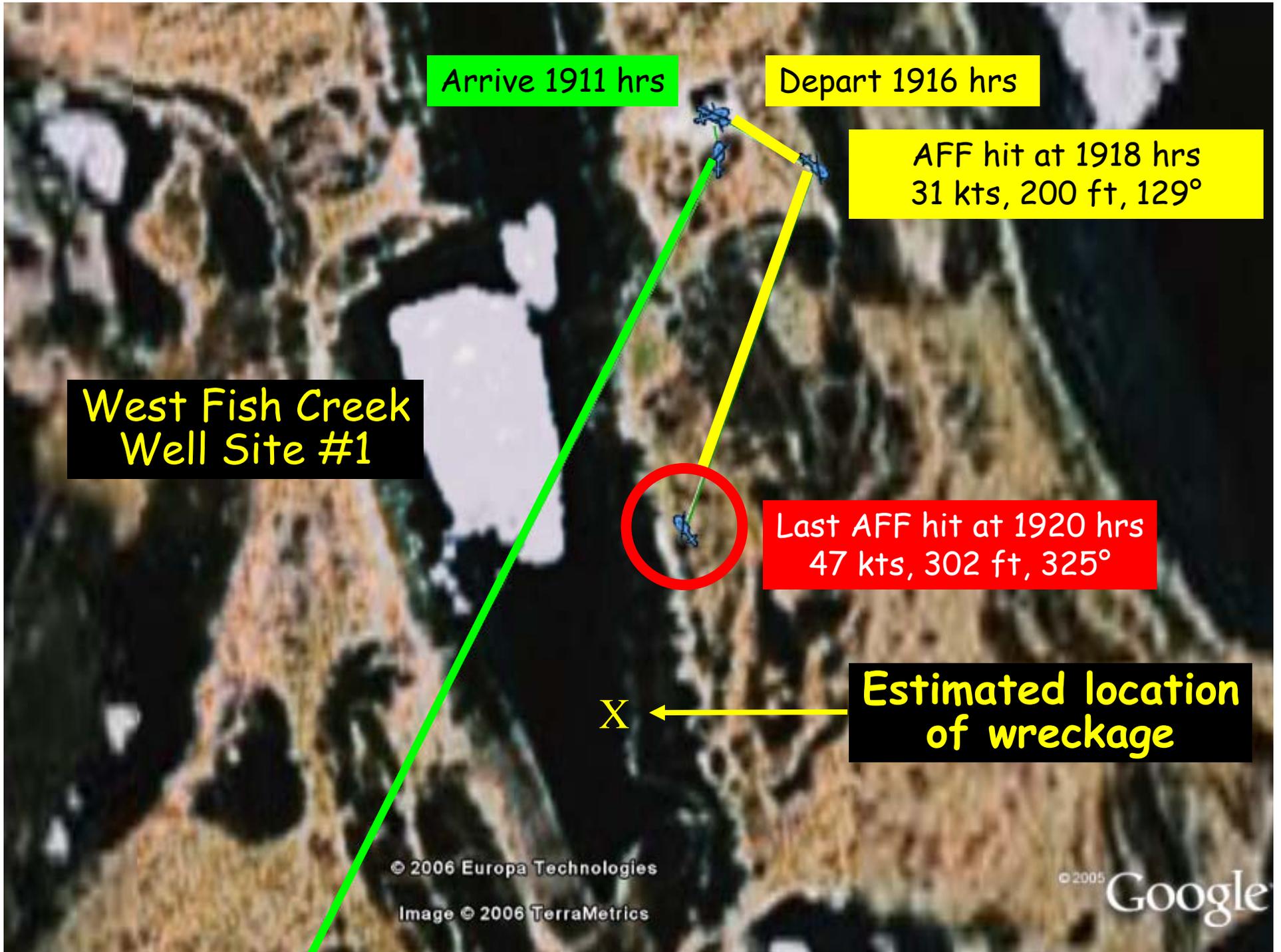
Estimated location
of wreckage

X

© 2006 Europa Technologies

Image © 2006 TerraMetrics

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Looking North along probable flight path



Overview of Accident Site



Relationship of Main Wreckage



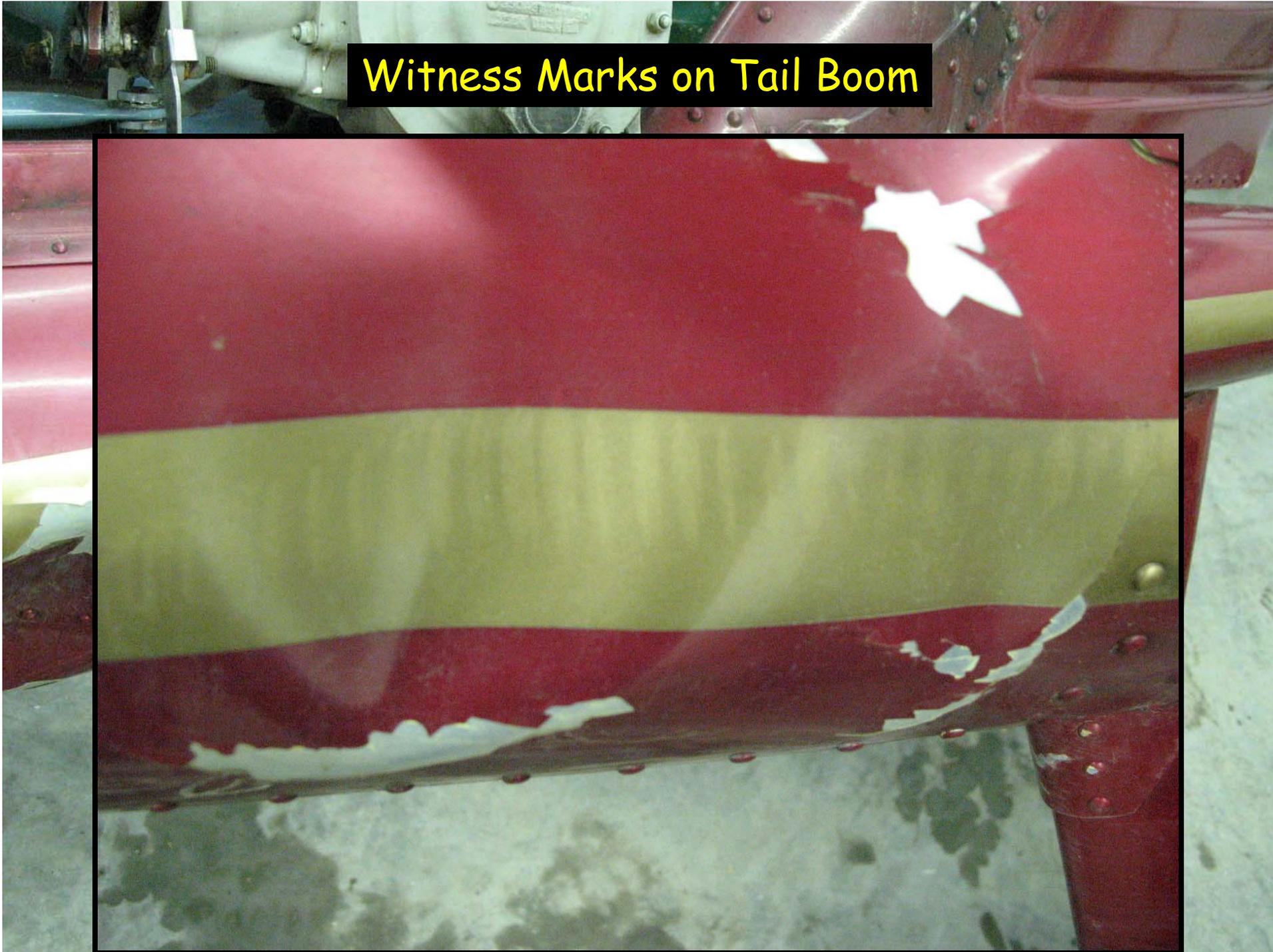
Cargo and Netting



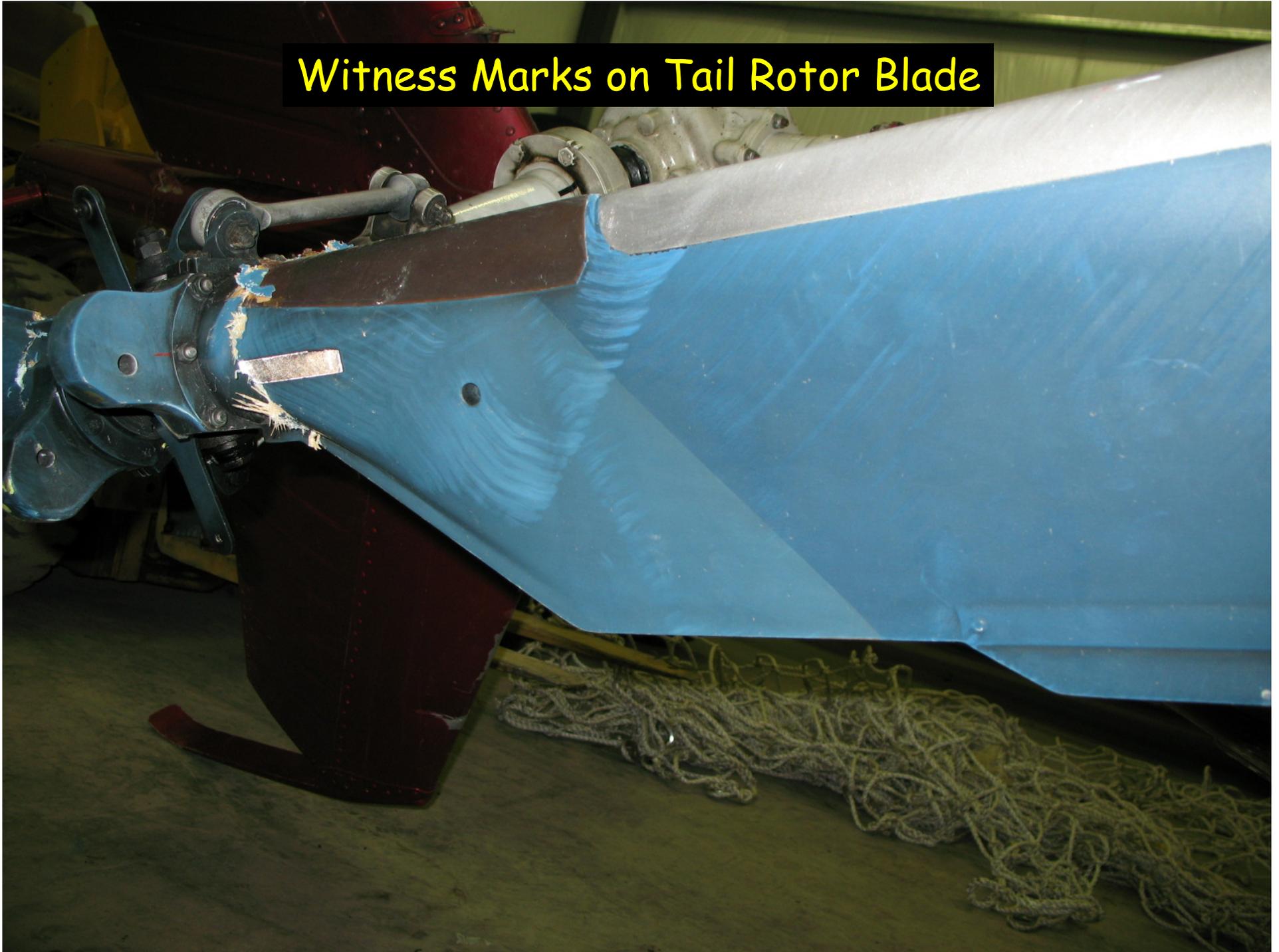
Separation and Abrasion of "Purse String"



Witness Marks on Tail Boom



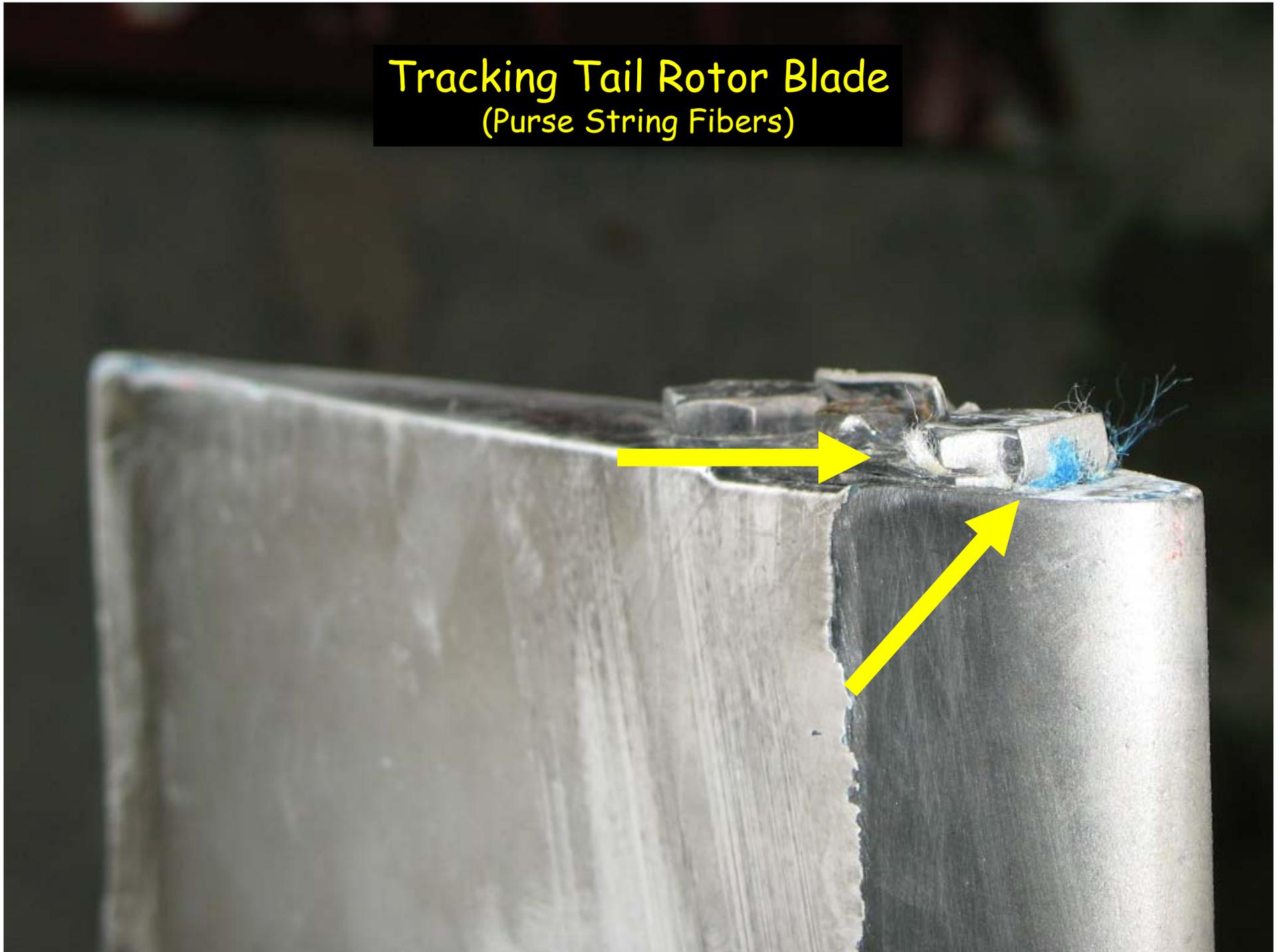
Witness Marks on Tail Rotor Blade



**Non-Tracking Tail Rotor Blade Destroyed
(high energy impact)**



Tracking Tail Rotor Blade
(Purse String Fibers)



Tailboom Separation
(tension on right, compression on left)



Tail Rotor Driveshaft and Cover
(evidence that the driveshaft was turning when the tailboom separated)



Discussion



I Chose To Look The Other Way

I could have saved a life that day, but I chose to look the other way.
It wasn't that I didn't care, I had the time, and I was there.

But I didn't want to seem a fool, or argue over a safety rule.
I knew he'd done the job before, if I called it wrong, he might get sore.

The chances didn't seem that bad, I'd done the same, he knew I had.
So I shook my head and walked on by, he knew the risks as well as I.

He took the chance, I closed an eye, and with that act, I let him die.
I could have saved a life that day, but I chose to look the other way.

Now every time I see his wife, I'll know, I should have saved his life.
That guilt is something I must bear, but it isn't something you need share.

If you see a risk that others take, that puts their health or life at stake.
The question asked, or thing you say, could help them live another day.

If you see a risk and walk away, then hope you never have to say,
I could have saved a life that day, but I chose to look the other way.