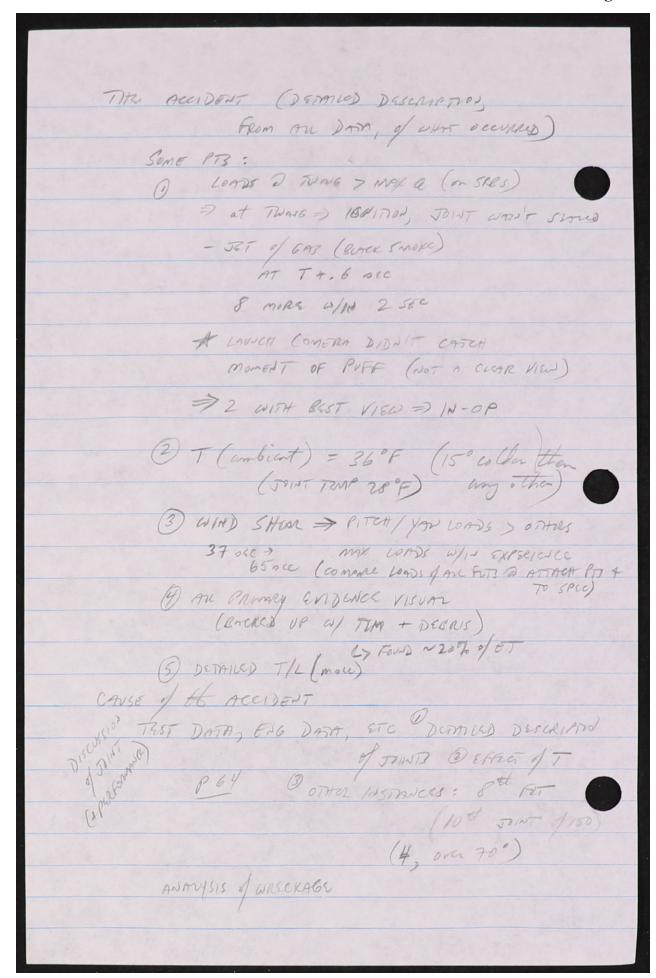
- --SPECIFIC WAYS TO IMPROVE THE ORBITER MAINTAINANCE DOWN PERIOD.
- --WHAT TO LOOK FOR ON BOLT FRACTURES, HOLDPOST ANOMALIES, SRB ATTACH RINGS, TEST EQUIPMENT AND TRAINING NEEDS.

#### CHAIRMANS WRAP UP:

- -MOST ACCIDENT INVESTIGATIONS FAIL TO DIG DEEPLY ENOUGH INTO THE CAUSES BEYOND IDENTIFYING THE WIDGET THAT BROKE AND THE PERSON IN THE CAUSAL CHAIN CLOSEST TO THE WIDGET THAT BROKE...THIS IS A MISTAKE. THEY DON'T GET TO THE FIXES TO PREVENT FUTURE REPEATS
- -FOUR DECOUPLINGS
- -- TAKE STEPS TO REDUCE DEBRIS CREATION IN THE FIRST PLACE <
- -- TOUGHEN THE ORBITER &
- --INSPECT AND REPAIR THE ORBITER
- --ENHANCE CREW SURVIVABILITY (NASA'S TASK)
- -THREE TYPES OF RECOMMENDATIONS
- --SHORT TERM: RTF
- --MID-TERM: CONTINUING TO FLY, 3-12 YEARS
- --LONG-TERM: REPLACE THE SHUTTLE
- -IT IS OUR INTENT THAT THIS REPORT BE THE BASIS FOR AN IMPORTANT PUBLIC POLICY DEBATE THAT SHOULD FOLLOW US.
- -WHAT IS THE NATIONS VISION FOR HUMAN SPACE FLIGHT
- -ARE WE WILLING TO RESOURCE THAT VISION
- -HOW URGENT IS IT TO REPLACE THE SHUTTLE
- -WHAT SHOULD THE BALANCE BETWEEN ROBOTIC AND HUMAN EXPLORATION BE



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### **Copyright:**

Not Researched

#### **Transcription:**

THE ACCIDENT (DETAILED DESCRIPTION, FROM ALL DATA, OF WHAT OCCURRED)

#### **SOME PTS:**

1. LOADS @ [[GOOD GUESS??]] TWAIG [[/GOOD GUESS] > MAX A (on SRBS)

=> at [[GOOD GUESS??]] TWAIG [[/GOOD GUESS]-> IGNITION, JOINT WASN'T SEALED

- JET OF GAS (BLACK SMOKE)

AT T +.6 SEC

8 MORE W/IN 2 SEC

# LAUNCH CAMERA DIDN'T CATCH

MOMENT OF PUFF (NOT A CLEAR VIEW)

=> 2 WITH BEST VIEW => IN-OP

2 T(ambient)= 36°F (15 colder than any other) (JOINT TEMP 28°F)

3 WIND SHEAR => PITCH/YAW LOADS > OTHERS
37 SEC -> MAX LOADS W/IN EXPERIENCE
65sec (COMPARE LOADS OF ALL FLTS @ ATTACH PTS & TO SPEC)

4 ALL PRIMARY EVIDENCE VISUAL (BACKED UP W/ TLM + DEBRIS)
-> FOUND ~ 20% OF ET

5 DETAILED T/L [[good guess]] (male) [[/good guess]]
CAUSE OF ACCIDENT
[[left align]] DISCUSSION OF JOINT + PERFORMANCE) [[/left align]]
TEST DATA, ENG DATA, ETC 1 DETAILED DESCRIPTION
OF JOINTS 2 EFFECT OF T
P64 3 OTHER INSTANCES: 8th FLT
(10th JOINT OF 150)
(4, over 70°)

ANALYSIS OF WRECKAGE

PUTTY
(15 section of FADINGS) =) (6 FADINGS   0-RUSE
25 FTB 21 > 61° (4 pobland) GAPS  4 < 61° all had pobland Horows
1 coscusios:
> due to faulty design, unacceptably
sunsitive to a number of factor
(T, physical dimensions/tol, material,
effect of re-usability/processing, reaction
of joint & agnaries)
CONTRIBUTING CAUSES
- DECISIONS BODD ON LACOMPLETE, SOMETIMED MISCENIAGE
NOTE: LEVEL I = AA/CD,
(ALDRICH) LEVEL IX = Contractor  (ALDRICH) STIT = PROST MERS
(and austrisian) GI I = PGM onces
> Lower People Decroes (392) (7)
T WASH'T A CONCRA (27)
OT WASH'T A CONCORN (2-71
4 FINDINGS: PRAN IN LAUNCH DECISION-MAKING PROCESS
O CHICING of CONSTRANTS at Expense of  sofety - no requirement that parkers  had to be neverised / considered at
hat to be revisived t considered at
3 MSFE @ Thicked reversed position
3 MSFE (9) Thicked neversed position
3 Mare REGARDING ICE-ON-PAD (+ LAURCH DECISION)

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## **Copyright:**

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#### **Transcription:**

(1st SECTION OF FINDINGS) => 16 FINDINGS 25 FEB 21 > 61° (4 problems) 4 < 61° all had problems

[[List from right top margin]] [PUTTY
[O-RING [SEALING
[GAPS [DYNAMICS
[HANDLING
[[/List from right top margin]]
[[arrow pointing from top list to "1 CONCLUSIONS"]]

#### 1 CONCLUSION:

-> due to faulty design, unacceptably sensitive to a number of factors (T, physical dimensions/ tol, materials effect of re-usability/ processing, reaction of joint to dynamics)

#### **CONTRIBUTING CAUSES**

- DECISIONS BASED ON INCOMPLETE, SOMETIMES MISLEADING INFO
- DIDN'T GET TO

**EQUIV OF DITTEMORE** 

(ALDRICH)

(whole discussion,

not launch discussion)

=> LOWER PEOPLE DECIDED

IT WASN'T A CONCERN

[[right margin]]

NOTE:

LEVEL I = AA/CD/E8

LEVEL IV = contractors NASA

# III PROJ MGRS

Cert [[?]] [[arrow pointing to III]]

# II = PGM MGRS

# I

FRR

(2#1

[[left of # I]]

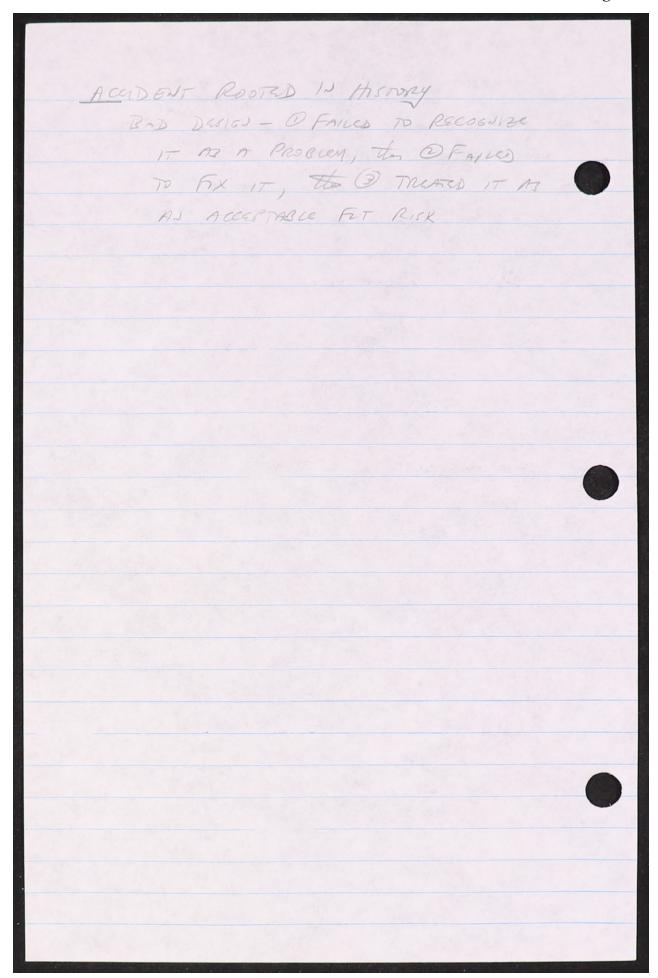
COFR

(3 # 2)

[[/right margin]]

4 FINDINGS = (1) FLAW IN LAUNCH DECISION - MAKING PROCESS

- (2) WAIVING OF CONSTRAINTS at EXPENSE OF safety no requirement that waivers had to be reviewed / considered at all levels
- (3) MSFC (4) [[good guess]] Thiokol reversed position
- 3 MORE REGARDING ICE ON PAD ( & LAUNCH DECISION)



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# **Copyright:**Not Researched

## **Transcription:**

ACCIDENT ROOTED IN HISTORY BAD DESIGN- (1) FAILED TO RECOGNIZE IT AS A PROBLEM, then (2) FAILED TO FIX IT, [[?]] (3) TREATED IT AS AS ACCEPTABLE FIT RISK