

# ZK-NBU

(B747-400)

## Inflight Wing Panel Separation

NZ99 AKL-NRT

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Operational Safety – Air New Zealand

# Basic Errors that Became Everyone's Problem



# Maintenance Activity

- Inducted for Phase CO1 Check
- Check Included Repeat Alert Service Bulletin
  - *(Post pylon modification inspection)*
- Interrupted maintenance
  - *Removed from hangar*
  - *Re-inducted/removed several times*
- Complete 26 days after original induction
- Inflight Panel separation
  - *1st flight after check*



# Maintenance Interruption

- Regular Occurrence
  - *“Window of Opportunity for Procedural Error”*
  - *Existing Work Packages Robust enough to enable program interruption ??*
  - *Procedural Defences to capture activities “introduced” during interruptions ??*

# First Maintenance Interruption

## Handover Report

*"All panels re-installed ready for park outside – marked with red X – only minimal screws holding closed. S/O raised for this work. All removed parts put in shelving and marked NBU"*

# Temporary Panel Installation

- Four screws (out of 125)
- Shift Handover Report
- No other references
- Exposure to the environment ?
- **X** - Common practice not formalised
- Visibility



## SHEET \_\_\_\_ OF \_\_\_\_

TIME IN 0700 TIME OFF 1830 DATE 04-08-02

CRANE, EQUIPMENT, TOOLING AND STAFF

SUPERVISOR / PRODUCTION LEADER / TEAM LEADER

DATE	TIME
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Why was the omission not identified during documentation check ?

Work: 12.0 No: 2 Target: SB(INT)/747-54A2182/INBOARD PYLON INSPIN  
80163792

PYLON INSPECTION - CLOSE ACCESS - AIRFRAME

POS	JOB DESCRIPTION
01	
02	<p>Reference Document - BOE SB 747-54A2182 Rev 00.</p> <p>Complete and certify tasks detailed in applicable reference document accomplishment instructions.</p> <p>Observe reference document Notes, Cautions, Warnings, and general safety precautions.</p> <p>Raise Service Orders for any additional work, or work arising.</p> <p>A. Pylon Inspections - Close Access:</p> <p>Pylon No <u># 2</u></p> <ol style="list-style-type: none"><li>(1) Wing leading edge gap cover installed.</li><li>(2) <del>Diagonal brace fuse pin access doors installed.</del> AMM 54-62-00.</li><li>(3) Midspar fitting fuse pin access doors installed (Inboard pylon only). AMM 54-62-00.</li><li>(4) Mid-pivot pin access doors installed (Outboard pylon only). AMM 54-62-00.</li><li>(5) Strut access doors installed. AMM 54-62-00.</li><li>(6) Trailing edge fairing doors installed. xcf AMM 54-62-00. of 0010</li></ol>

# Generic Task Card Produced from Service Bulletin

Unnecessary Task

No Reference Manual for  
Procedures

Inappropriate Panel  
Identification



# Panel Identification Inconsistencies

- SB (All Pylons)
  - *"Gap Cover on Wing Leading Edge"*
- 747-400 AMM (#2 and #3 pylons)
  - 511CT/611CT
  - *"Access Panel – Upper Inboard Nacelle"*
- 747-400 AMM (#1 and #4 pylons)
  - 521/621FT
  - *"Access Panel – Upper Outboard Nacelle Gap Cover"*
- Task Cards
  - *"Wing Leading Edge Gap Cover"*



Work: 12.0 No: 2  
80163792

Target:  
SB(INT)/747-54A2182/INBOARD PYLON INSPTN

Follow Ons Raised? [ ]

PYLON INSPECTION - CLOSE ACCESS - AIRFRAME

OS	JOB DESCRIPTION	WRK BY	QC CHK
01 02	<p>Reference Document - BOE SB 747-54A2182 Rev 00.</p> <p>Complete and certify tasks detailed in applicable reference document accomplishment instructions.</p> <p>Observe reference document Notes, Cautions, Warnings, and general safety precautions.</p> <p>Raise Service Orders for any additional work, or work arising.</p> <p>A. Pylon Inspections - Close Access:</p> <p>Pylon No <u># 2</u></p> <p>(1) Wing leading edge gap cover installed.</p> <p>(2) Diagonal brace fuse pin access doors installed. AMM 54-62-00.</p> <p>(3) Midspar fitting fuse pin access doors installed (Inboard pylon only). AMM 54-62-00.</p> <p>(4) Mid-pivot pin access doors installed (Outboard pylon only). AMM 54-62-00.</p> <p>(5) Strut access doors installed. AMM 54-62-00.</p> <p>(6) Trailing edge fairing doors installed. AMM 54-62-00.</p>	<p>PTO</p> <p>4447</p> <p>N/A</p> <p>NOT COMPLETED</p> <p>xcel of 0010</p>	<p>31282</p>



OP/ITEM #	CORRECTION/RECTIFICATION ACTION	WORK BY	QC CHECK
POS 02			
A (1)	INSTALL WING PANEL S11 CT	P. L. L. 41197	32868

The tradesman who had been assigned to the LH wing mis-identified the panel in the hand-written task for the #3 pylon. He incorrectly assumed that it was the panel he had just installed above the #2 pylon and signed off as a duplicate task.

The QC Engineer similarly assumed it was a duplicate task for the previously installed panel

OP/ITEM #	CORRECTION/RECTIFICATION ACTION	WORK BY	QC CHECK
A1	INSTALL & SEAL PANEL 611CT	P. L. L. 41197	32915



# Duplicate Tasks

*Generic operations for two or more identical tasks for different and unrelated activities.*

# Generic Task Cards

- Signature Block – **PTO**
  - Created Hand-written instruction
  - Existing Hand-written Task Correction History
  - AOP Process Existed for Task Card Correction
    - *No response/feedback from Lead Hands/ Supervisors*
    - *No response from Planners*
- Planners
  - No Human Factors training
  - No formal Tech-writer training

# Preparation for Despatch Task

## The Final Defence

*“Carry out external walk around check.  
Ensure all access panels are secure”*

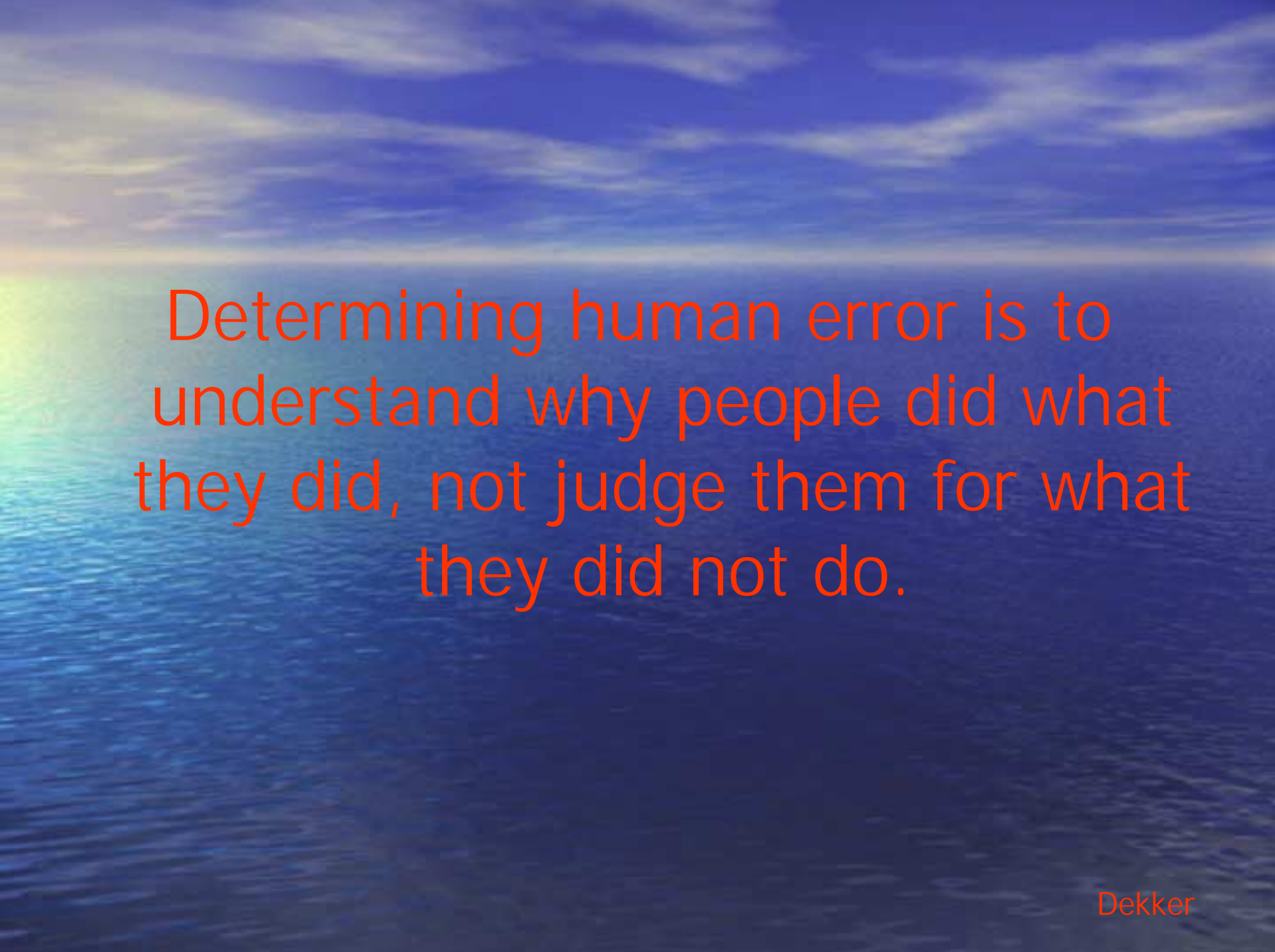


# *"Prepare for Despatch"* Task Card

- Brief description
- Area visibility
- No Line / Terminal Services acceptance check
- B767
- B737
- Two hour task assigned to one person
- Task delegation (Normal Practice)
  - At Risk Behaviour or Normal Behaviour ?
- Signed by one person
  - At Risk Behaviour or Normal Behaviour ?

# Issues

- Task / Procedure Design
- Maintenance Activity Control / Monitoring
- Supervision
- Safety Culture
- Maintenance Practices



Determining human error is to  
understand why people did what  
they did, not judge them for what  
they did not do.