

China Airline CI676 Nagoya Incident

26 April 1994

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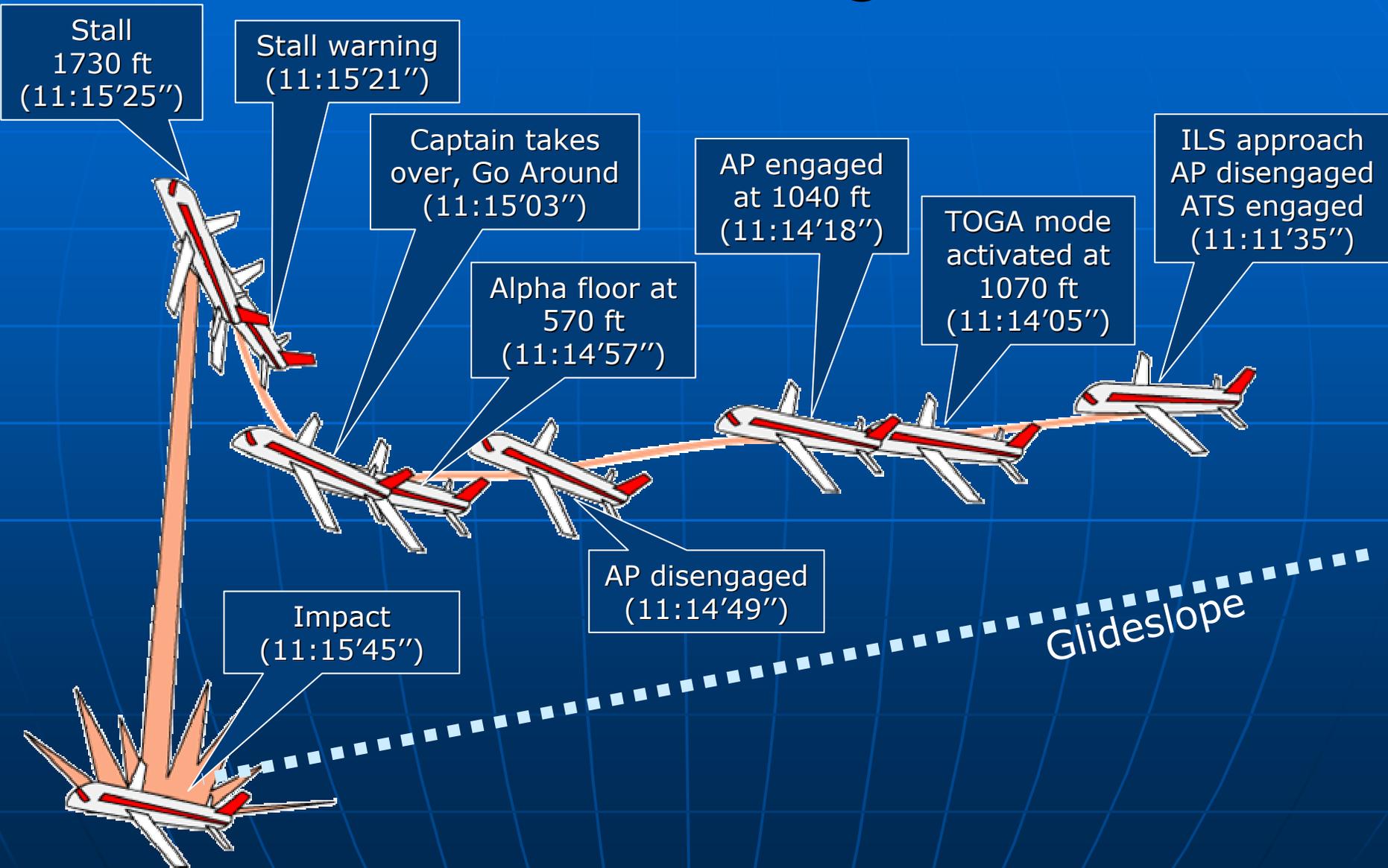
Outline

- I. Accident Background
- II. Investigation Results
- III. Airbus Automation Issues
- IV. Recommendations

China Airline CI676 (A300B4-622R B1816)



Accident Background



Investigation Results

- TOGA mode by the First Officer
- Misunderstanding of the state of the aircraft (out-of-trim condition)
 - Autopilot activation in TOGA mode
 - Pilots opposing the aircraft's motion
- Poor crew coordination—
miscommunication and poor execution
- Earlier service bulletin not enforced

Go Lever Position

(Image removed due to copyright considerations.)

A300-600 Out-of-Trim Condition

- Trimmable Horizontal Stabilizer (THS)
Out-of-trim Condition
 - THS controlled by AP
 - Override elevator control by crew
- Accidents
 - March 1, 1985
 - January 9, 1989
 - February 11, 1991
- Service Bulletin: SB A300-22-6021
 - "Modifications to the AFS which disengages the AP when a force in excess of 15kgf is applied..."--June 24, 1993

Airbus Automation Issues

- Autopilot disconnect
 - Captain mental model mismatch between B747 and the Airbus
- Disengagement of TOGA mode
- Airbus automation philosophy
 - Who has the last word?

Recommendations

- Clearer Crew Operating Manual
 - AFS operational ambiguity
 - Recovery procedures
- More informative auditory warnings
 - “Click Click Click”—huh?
- Display information should be modified based on “human cognitive process in high-stress situation”
 - At time of accident, aircraft mode on FD
 - Display aircraft mode clearly

Quote from an Expert

- “There have been issues with the design of the Airbus autopilots having to do with the automation philosophy Airbus uses.”
(CNN February 16, 1998)

Conclusion

- Human error was first mistake
- Automation misinterpretation contributed to escalation of accidental TOGA activation in a time-critical situation
- Service bulletin could have prevented the accident
- If crew had not opposed Go Around mode, could the crash have been avoided?