



NTSB National Transportation Safety Board

Office of Aviation Safety

Response to Stick Shaker and Stall

Human Performance
presentation

Crew Duties During Approach

- Heightened vigilance required during approach
- As flying pilot, captain's primary responsibility to monitor instruments
- As monitoring pilot, first officer to provide backup and corrective input

Cues of Slowing Airspeed

- Airspeed information on primary flight displays

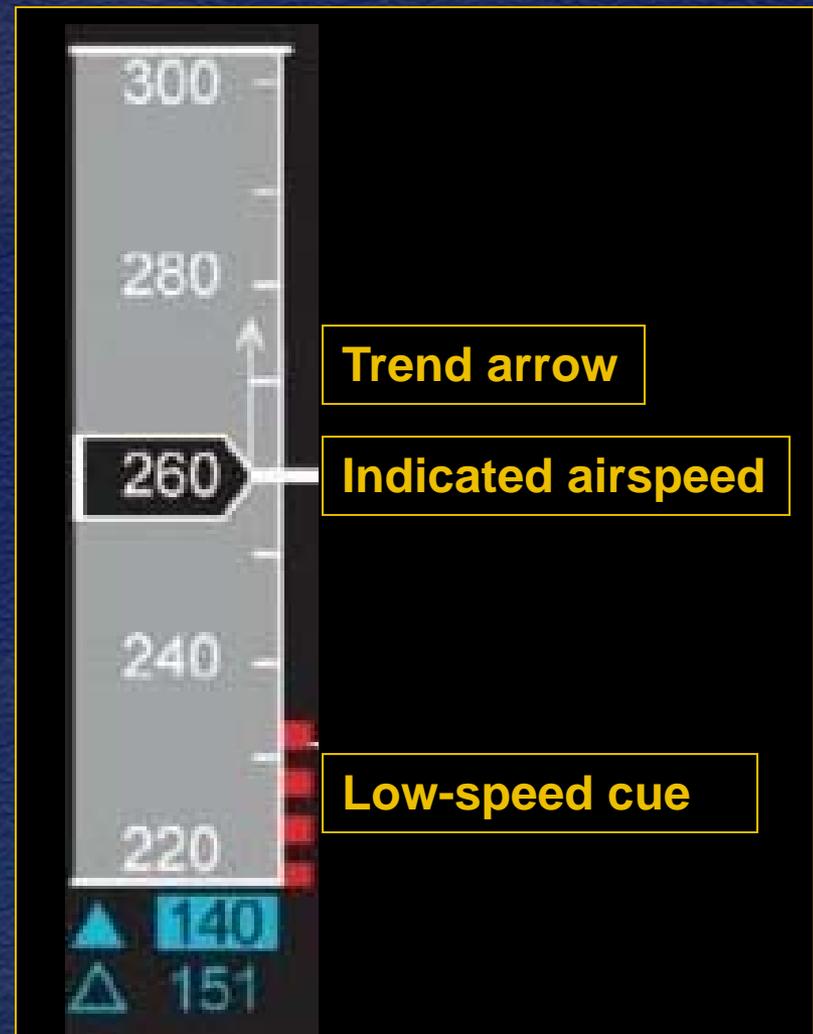
Primary Flight Display



Cues of Slowing Airspeed

- Airspeed information on primary flight displays
- Pilots must ensure airspeed remains above low-speed cue

Airspeed Display



Low-Speed Cue Missed

- Neither pilot remarked or took action as airspeed slowed to low-speed cue
- Cue position should have elicited prompt corrective action from pilots
- Adequate time to initiate corrective action before stick shaker

Crew Activities

- Captain should have seen cue during instrument scan
 - No evidence explained why it was missed
- First officer should have detected captain's error
 - Duties when cue was visible directed her attention away from primary flight display
- Missed cue reflects breakdown in monitoring and workload management



Preventing Monitoring Failures

- Methods to improve pilot monitoring behavior
- NTSB asked for training for monitoring skills
 - Safety Recommendation A-07-13

Response to Stick Shaker

- Captain's aft control column inputs led to stall
- Power advanced but not to rating detent
- Neither pilot made callouts or commands associated with stall recovery

Actions During Stall Event

- Simulator observations showed recovery procedures did not require exceptional inputs
- Control column was not pushed forward to prevent or recover from stall
- Captain's actions inconsistent with trained recovery procedures

Actions During Stall Event

- Captain's actions did not indicate well-learned habit pattern
- Improper inputs consistent with startle and confusion
- History of training failures may have played role

Actions During Stall Event

- First officer's uncommanded raising of flaps and suggestion to raise gear not consistent with recovery procedures
- Reasons for first officer's actions could not be determined



NTSB