National Transportation Safety Board

Source: Eric Adams

Inadvertent Activation of Fuel Shutoff Lever and Subsequent Ditching

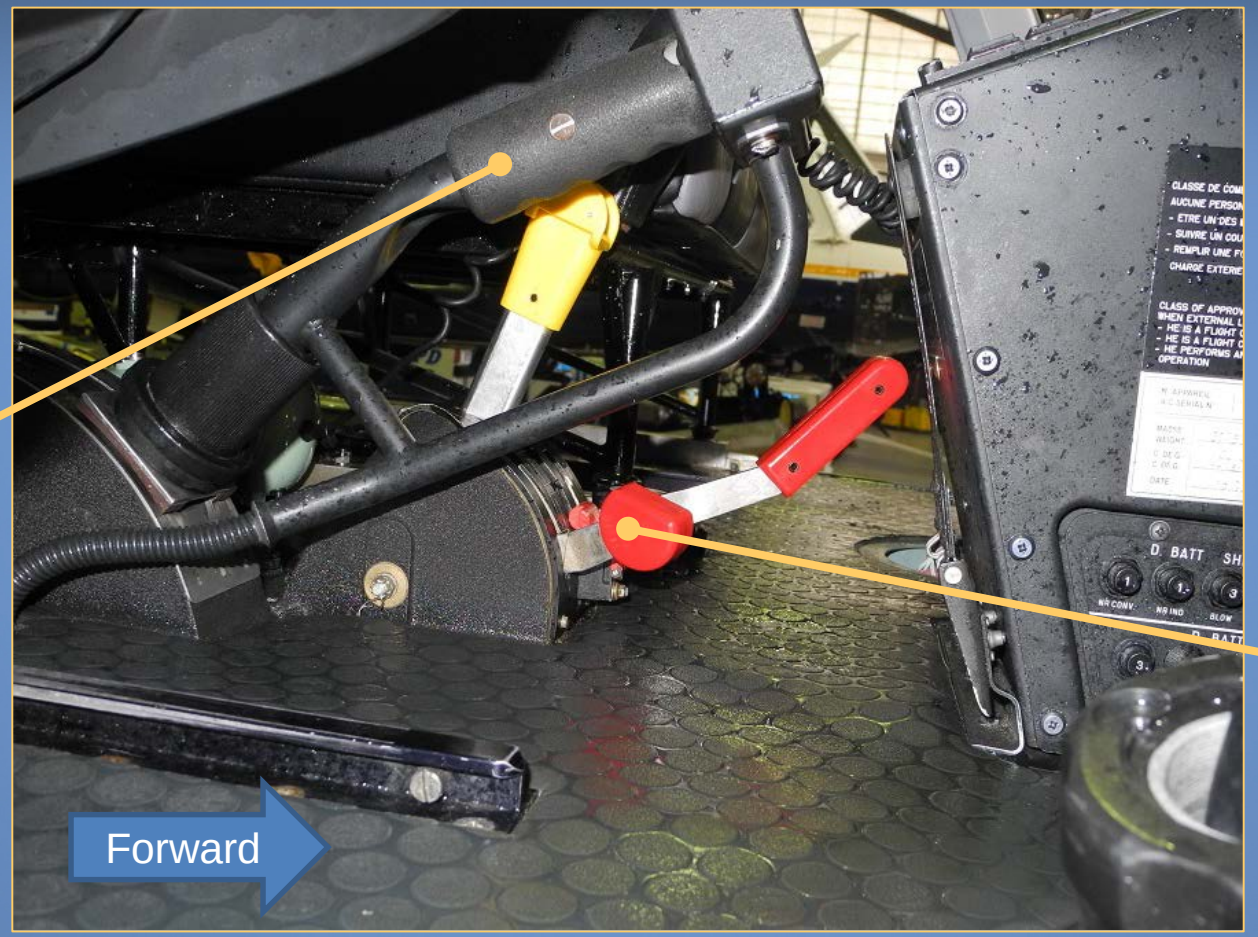
Liberty Helicopters Inc., AS350 B2, N350LH
New York, New York, March 11, 2018

Airworthiness and Emergency Flotation System presentation

Overview

- AS350 B2 floor-mounted controls
- Emergency flotation system (EFS)
  - Performance during accident flight
  - High pull forces on activation handle
  - Certification review issues

AS350 B2 Floor-Mounted Controls



NTSB

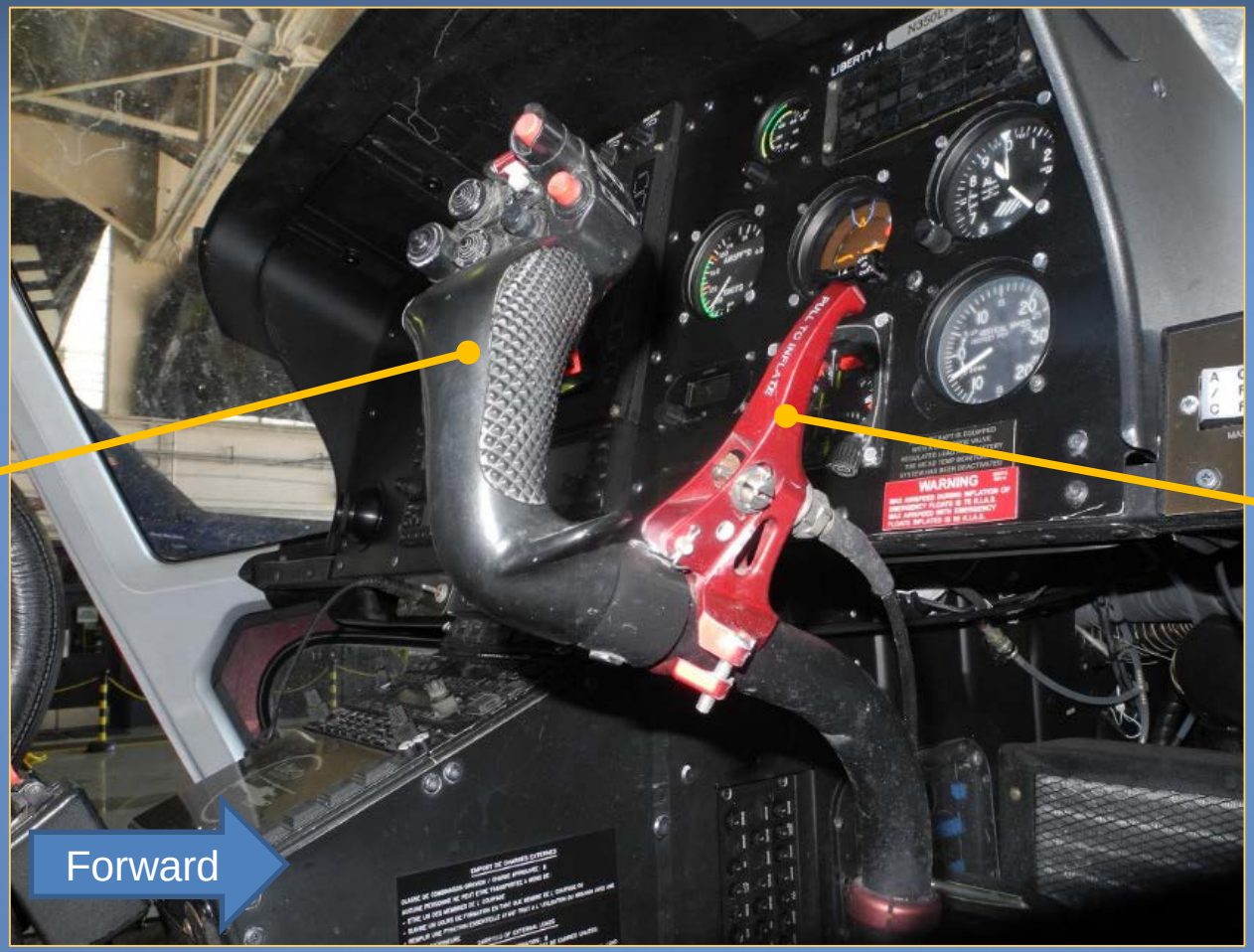
FSOL Design Requirements

- Certification review of FSOL
  - Considered scenarios in which pilot may select wrong lever
  - Not required to protect against external influences
- External influence risk typically controlled through operational measures

Dart EFS Design

Exemplar installation

EFS Deployment



NTSB

Accident EFS

- Only one reservoir discharged
  - Partial and asymmetric inflation of floats
  - Left floats more inflated than right floats
- Discharge of both reservoirs needed for full inflation
- Discharge of only one reservoir, even with symmetric inflation, would not enable helicopter to remain upright in water

Activation System Issues

- High pull forces needed to pull activation handle fully aft
- Reservoirs could discharge at different points during aft travel of handle
- Handle not pulled fully aft in accident flight

Handle Pull-Force Information

- No requirement to inspect and correct high pull forces on activation handle
- Dart postaccident safety actions included inspection for high pull forces on activation handle

Certification Review Issues

- FAA did not identify absence of pull-force limitation during certification review of Dart EFS
- Similar deficiencies may exist on other FAA-approved rotorcraft EFS
- FAA guidance does not sufficiently address human factors aspects for EFS activation systems

Summary

- Safety would be improved by
  - Reviewing other approved EFS for deficiencies that may preclude proper deployment
  - Improving guidance for assessing design features, usability, and inspection methods during certification review of EFS
  - Modifying FSOL design to enhance protection against external influences

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