3. Conclusions

3.1 Findings

- None of the following were factors in this accident: (1) the pilot's qualifications, which were in accordance with federal regulations and company requirements; (2) pilot fatigue or medical conditions; and (3) the airworthiness of the helicopter.
- The tail of the front passenger's tether caught on the fuel shutoff lever (FSOL) during the flight, which resulted in the inadvertent activation of the FSOL, interruption of fuel flow to the engine, and loss of engine power.
- The pilot autorotated the helicopter successfully and pulled the emergency flotation system activation handle to deploy the floats at an appropriate time; however, the floats inflated partially and asymmetrically.
- Liberty Helicopters Inc.'s and NYONair's decision to use locking carabiners and ineffective cutting tools as the primary means for passengers to rapidly release from the harness/tether system was inappropriate and unsafe.
- The helicopter's landing was survivable; however, the NYONair-provided harness/tether system contributed to the passenger fatalities because it did not allow the passengers to quickly escape from the helicopter.
- The Federal Aviation Administration's (FAA) approval process for supplemental passenger restraint systems (SPRS) that was implemented after the accident is inadequate because it does not provide guidance to inspectors to evaluate any aircraft-specific installations or the potential for entanglement that passengers may encounter during emergency egress.
- Although the crossover hose in the accident helicopter's emergency flotation system design did not perform its intended function to alleviate asymmetric inflation of the floats during a single-reservoir discharge event, buoyancy stability testing showed that even symmetric distribution of the gas from only one reservoir would not enable the helicopter to remain upright in water.
- In the absence of information from Dart Aerospace specifying pull-force limitations for the emergency flotation system's activation handle, Liberty and other operators lack a means to inspect for and correct high pull forces that may result from an installation anomaly or other issues.
- Although the accident pilot was aware that each gas reservoir may not discharge simultaneously, the high forces required to pull the activation handle, along with the aural and visual cues following a single-reservoir discharge, led the pilot to mistakenly believe that he had successfully pulled the handle fully aft to fully inflate the floats.
- The Federal Aviation Administration's certification review of the emergency flotation system design installed on the accident helicopter did not identify Dart Aerospace's omission of an activation handle pull-force limitation; thus, the FAA's reviews of other approved emergency flotation system designs may not have identified similar omissions.

- Improved guidance for aircraft certification offices for assessing design features, usability, and inspection methods that ensure successful deployment of an emergency flotation system could help ensure that these important aspects are considered during the certification review process for such systems.
- Through their repeated lack of involvement in key decisions related to Liberty Helicopters Inc.-operated FlyNYON flights, Liberty's managers allowed NYONair personnel, particularly NYONair's chief executive officer, to influence core aspects of the operational control of those flights.
- Ineffective safety management at both Liberty Helicopters Inc. and NYONair resulted in a lack of prioritization and mitigation of foreseeable risks.
- Liberty Helicopters Inc. and NYONair exploited the exception at Title 14 *Code of Federal Regulations* 119.1(e)(4)(iii) allowing aerial photography flights to be operated under Part 91, thereby avoiding the additional Federal Aviation Administration requirements and oversight that apply to commercial air tours conducted under either Part 135 or Part 91 with an air tour letter of authorization.
- Without regulatory language that defines the terms "aerial work" and "aerial photography" to include only business-like, work-related aerial operations, operators may attempt to take advantage of the exception at Title 14 *Code of Federal Regulations* 119.1(e)(4)(iii) to carry revenue passengers for personal, entertainment, or leisure purposes without the additional Federal Aviation Administration requirements and oversight that apply to other commercial, revenue passenger-carrying operations.
- The Federal Aviation Administration principal operations inspector assigned to oversee Liberty Helicopters Inc. did not conduct additional surveillance of Liberty's operations after being made aware of its FlyNYON flights and failed to ensure that Liberty was appropriately managing the risks associated with the significant change in operations.
- Because the Federal Aviation Administration (FAA) continues to allow passenger revenue operations to be conducted under Title 14 *Code of Federal Regulations* Part 91—some of which, like the FlyNYON flight operations, transport thousands of passengers annually—the FAA must provide inspectors with sufficient guidance to pursue more comprehensive oversight with regard to potential hazards they observe and to ensure that operators sufficiently mitigate risks.
- Although the certification basis for the accident helicopter's fuel shutoff lever did not require protection from inadvertent activation due to external influences, a design modification that includes such protection could enhance safety more effectively than continued reliance on operational measures.
- The risk of the NYONair-provided harness/tether system tether tail becoming entangled with the floor-mounted fuel shutoff lever existed independently from passenger intoxication and most likely depended primarily on the passenger's positioning in the cabin.
- When passengers are seated in close proximity to an aircraft's controls, it is critical that they not be impaired to reduce the likelihood of interference with the pilot's ability to safely fly the aircraft.