# 3. Recommendations

## 3.1 New Recommendations

As a result of this investigation, the National Transportation Safety Board makes the following new safety recommendations:

**To the Federal Aviation Administration:**

Require that existing Airbus Helicopters dual-hydraulic AS350-series helicopters be equipped with a visual and an aural alert for the loss of hydraulic boost to the pedal controls, which would result in increased pedal loads. (A-17-8)

**To Airbus Helicopters:**

For newly manufactured dual-hydraulic AS350-series helicopters, assess and implement changes to the dual hydraulic system that would both ensure pedal control hydraulic assistance and mitigate the possibility of pilot error during any check of the hydraulic system. (A-17-9)

For existing dual-hydraulic AS350-series helicopters, assess and implement changes to the dual hydraulic system that would both ensure pedal control hydraulic assistance and mitigate the possibility of pilot error during any check of the hydraulic system. (A-17-10)

**To the Federal Aviation Administration and the European Aviation Safety Agency:**

After the actions requested in Safety Recommendation A-17-10 are completed, require operators of Airbus Helicopters dual-hydraulic AS350-series helicopters to incorporate changes to the dual hydraulic system to both ensure pedal control hydraulic assistance and mitigate the possibility of pilot error during any check of the hydraulic system. (A-17-11)

**To the Association of Critical Care Transport:**

In collaboration with the Association of Air Medical Services and the Air Medical Operators Association, establish a working group to develop and distribute guidelines, for those who purchase, lease, or contract for helicopters, regarding the equipment and systems that would enhance the helicopters' crashworthiness, including, at a minimum, a crash-resistant fuel system and energy-absorbing seats. (A-17-12)

**To the Association of Air Medical Services and the Air Medical Operators Association:**

Work with the Association of Critical Care Transport to establish a working group to develop and distribute guidelines, for those who purchase, lease, or contract for

helicopters, regarding the equipment and systems that would enhance the helicopters' crashworthiness, including, at a minimum, a crash-resistant fuel system and energy-absorbing seats. (A-17-13)

## 3.2 Previously Issued Recommendations

As a result of this accident investigation, the National Transportation Safety Board previously issued the following recommendations:

**To the Federal Aviation Administration:**

Once Airbus Helicopters completes development of a retrofit kit to incorporate a crash-resistant fuel system into AS350 B3e and similarly designed variants, prioritize its approval to accelerate its availability to operators. (A-16-8) (Open—Acceptable Response)

Issue a special airworthiness information bulletin (SAIB) informing all owners and operators of AS350 B3e and similarly designed variants of the availability of a crash-resistant fuel system retrofit kit and urging that it be installed as soon as practicable. To encourage helicopter owners and operators to retrofit existing helicopters with a crash-resistant fuel system, the SAIB should also discuss the helicopter accidents cited in this report. (A-16-9) (Open—Acceptable Response)

Issue a special airworthiness information bulletin that is periodically updated to inform all helicopter owners and operators about available modifications to improve fuel system crashworthiness and urge that they be installed as soon as practicable. To encourage helicopter owners and operators to retrofit existing helicopters with a crash-resistant fuel system, the SAIB should also discuss the helicopter accidents cited in this report. (A-16-10) (Open—Acceptable Response)

**To the European Aviation Safety Agency:**

Once Airbus Helicopters completes development of a retrofit kit to incorporate a crash-resistant fuel system into AS350 B3e and similarly designed variants, prioritize its approval to accelerate its availability to operators. (A-16-11) (Open—Acceptable Response)

## 3.3 Previously Issued Recommendations Reiterated in This Report

The National Transportation Safety Board reiterates the following recommendations to the Federal Aviation Administration:

Require the installation of a crash-resistant flight recorder system on all newly manufactured turbine-powered, nonexperimental, nonrestricted-category aircraft that are not equipped with a flight data recorder and a cockpit voice recorder and are operating under 14 *Code of Federal Regulations* Parts 91, 121, or 135. The crash-resistant flight recorder system should record cockpit audio and images with

a view of the cockpit environment to include as much of the outside view as possible, and parametric data per aircraft and system installation, all as specified in Technical Standard Order C197, 'Information Collection and Monitoring Systems.' (A-13-12)

Require all existing turbine-powered, nonexperimental, nonrestricted-category aircraft that are not equipped with a flight data recorder or cockpit voice recorder and are operating under 14 *Code of Federal Regulations* Parts 91, 121, or 135 to be retrofitted with a crash-resistant flight recorder system. The crash-resistant flight recorder system should record cockpit audio and images with a view of the cockpit environment to include as much of the outside view as possible, and parametric data per aircraft and system installation, all as specified in Technical Standard Order C197, 'Information Collection and Monitoring Systems.' (A-13-13)

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