Safety recommendation no. 530

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Safety deficit	During the approach to the operations base, the pilot of an AgustaWestland AW109SP helicopter reduced the helicopter's forward speed whilst maintaining the rate of descent. The pilot continuously raised the collective to reduce the rate of descent. However, it did not reduce. During the transition from forward flight to hover, the helicopter's power requirement increased. At a forward speed of less than 20 kt, the rate of descent increased from 1,100 ft/min to more than 1,300 ft/min in the final seconds before impact and could no longer be controlled. Eventually, the helicopter hit the ground in a meadow next to the operations base. Three of the four occupants were injured and had to be admitted to hospital. This investigated accident concerned the collision of a helicopter with the ground, whose impact was, in principle, survivable for the occupants due to the acting forces. The helicopter type was fitted with impact-attenuating seats to prevent injuries. Despite this, two crew members and one passenger sustained serious back injuries. The investigation has shown that the seats were neither defective nor did they have any manufacturing or design faults. They had been certified in accordance with current regulations and fulfilled the approval requirements. The reason for the aircraft occupants' injuries was that the dynamics of the impact were significantly different from those the protection system was designed for. It is therefore doubtful whether the approval test is sufficiently realistic as it is based on only one possible scenario. At least regarding this investigated accident, the test scenario appears to be inadequate as the seats should have absorbed the forces involved.
Safety recommendation	The Federal Office of Civil Aviation (FOCA) and the European Aviation Safety Agency (EASA) should examine whether the test procedures for impact-attenuating seats in the AgustaWestland AW109SP helicopter type conform to the actual conditions arising in a crash that is in principle survivable. If necessary, the testing and approval requirements should be improved so that the seats offer sufficient protection in accidents of this type.
Addressees	EASA Europäische Agentur für Flugsicherheit; EASA Europäische Agentur für Flugsicherheit; BAZL Bundesamt für Zivilluftfahrt
Stage of the implementation	Implemented. The FOCA is of the opinion that the safety recommendation can only be addressed by the competent certification authority, i.e. The European Union Aviation Safety Agency EASA. EASA has indicated that the AW109SP helicopter type meets the currently applicable impact resistance requirements in the case of an emergency landing or of a survivable crash. The Rotorcraft Occupant Protection Working Group (ROPWG) of the Aviation Rulemaking Advisory Committee (ARAC), in which EASA

Swiss Transportation Safety Investigation Board STSB
CH-3003 Berne
Tel.: +41 58 466 33 00, Fax.: +41 58 463 33 01
info@sust.admin.ch
www.sust.admin.ch

	also participates, is drawing up possible recommendations to the certification authorities; these also address improving the chances of survival in the event of an accident. EASA intends to await the results of this working group and, if appropriate, incorporate them into new rules and regulations affecting aircraft manufactured and certified in Europe. EASA issued the type certificate (TC) ref. EASA.R.005 on 25 May 2009 for the Leonardo S.p.A. helicopter (formerly known as AgustaWestland S.p.A.) AW109 SP. In this type-certification procedure, the design of the AW109 SP seats complied with the applicable accident-worthiness requirements specified in the Type Certificate Data Sheet (TCDS), ref. EASA.R.005. These requirements were established to give occupants the greatest possible chance of exiting a rotorcraft without significant injury following a survivable emergency landing or crash. In November 2015, the Federal Aviation Administration (FAA) tasked the Aviation Rulemaking Advisory Committee (ARAC) with drawing up recommendations on requirements for occupant protection in normal and transport category rotorcraft. An ARAC working group, the Rotorcraft Occupant Protection Working Group (ROPWG), was asked to make recommendations to ARAC on occupant protection requirements for initial certification and continued airworthiness of rotorcraft that had not yet fully included the latest occupant protection requirements into their design specifications. EASA participated in the ARAC working group with the intention of applying its findings to the existing fleet of EASA States in the context of EASA rulemaking task RMT.0710: Improvement in the survivability of rotorcraft occupants in the event of a crash. In particular, its aim was to apply the latest accident-worthiness requirements with a view to improving the survivability of the occupants of rotorcraft in the event of a survivable crash and to make recommendations that the requirements should be applied in part or in full to all existing or recently manufactured fleets. As mentioned above, this does not apply to the AW109 SP as it already fully complies with the accident-worthiness requirements as specified in TCDS ref. EASA.R.005. The ARAC working group's detailed investigations concluded that current accident-worthiness requirements are sufficient and therefore do not need to be modified or improved. Consequently, EASA concludes that the seat testing and certification procedures as described in the latest Certification Specification CS 27/29 do not require any modification or improvement.
Investigation report concerning the safety recommendation	Schlussbericht

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CH-3003 Berne
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