

# HELICOPTER EXTERNAL LOAD OPERATIONS INFORMATION

## Part 133 External Load Helicopter Operations

14 CFR Part 133 is the regulation that applies to the conduct of rotorcraft external-load operations in the United States. By FAA definition, an external load means a load that is carried or extends outside of the aircraft fuselage.

There are four main rotorcraft-load combinations or classes of helicopter external loads that the FAA has defined. These are:

**Class A** rotorcraft-load combination means one in which the external load cannot move freely, cannot be jettisoned, and does not extend below the landing gear.

Example: These loads are usually associated with cargo racks or other equipment installed on the outside of the helicopter to carry cargo. Class A baskets are often used to carry skis or snowboards while conducting heli-ski flights.



Photo of a Class A cargo basket example  
Source: FAA

**Class B** rotorcraft-load combination means one in which the external load is jettisonable and is lifted free of land or water during the rotorcraft operation.

Example: These loads can be “belly hooked” (attached directly to the primary cargo hook) or be any length of line connected to the helicopter. These external loads can be released by the pilot from the primary (“belly”) hook or by a remote release. A water bucket, such as those used for fire fighting, is a Class B external load. A water bucket has a remote release to discharge only the water, and not the bucket itself. Some Class B external loads may also have a “remote hook release” which allows the pilot to release just the load at the end of the long-line.



Photo of a Class B external load example  
Source: FAA

**Class C** rotorcraft-load combination means one in which the external load is jettisonable and remains in contact with land or water during the rotorcraft operation.

Example: For some Class C external loads, an additional attaching device may be installed such as a side hook. In this example, the side hook is used to pull line through travelers to install new utility lines (e.g., phone, power, etc.). A Class C load could also be a helicopter towing a barge up a river. Some Class C external loads may involve a counter-weight attached to a line in contact with land or water.



Photo of Class C external load pulling line example  
Source: FAA

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**Class D** rotorcraft-load combination means one in which the external-load is other than a Class A, B, or C and has been specifically approved by the Administrator for that operation.

Example: Class D external loads are mostly associated with hoist operations carrying humans such as for Search and Rescue (SAR). Class D rotorcraft-load combinations may also be used for cargo (non-human) loads.



Photo of Class D hoist external load example  
Source: FAA

### Class B-HEC and Class D

Class B-HEC is a term used in FAA Order 8900.1 and Advisory Circular AC133-1B to describe Part 133 External Load Class B operations that involve flying people as the external load.

Human External Cargo (HEC) is when a person(s) at some point in the operation is carried external to the rotorcraft. Non-Human External Cargo (NHEC) is any other external cargo operation that does not at any time involve a person(s) carried external to the rotorcraft.

The previous Advisory Circular AC133-1A, with a published date of October 16, 1979, did not have any reference to human external cargo (HEC). Advisory Circular AC133-1 was revised in 2017 to include HEC information.

Although both Class B-HEC and Class D Rotorcraft Load Combination operations involve the carrying of a person or persons, the primary difference between Class B-HEC and Class D operations is usually the type of helicopter used.

In Class D External Load Operations, a helicopter type certificated under transport Category A and capable of hovering with one engine inoperative is a requirement by the FAA for Class D approval. Class B-HEC operations are usually conducted by non-transport category helicopters and are often conducted by single engine helicopters.

Class D external load operations that carry humans, such as search and rescue or ship personnel transfer flights, have more stringent regulatory requirements than Class B-HEC. These are:

1. Require initial and recurrent training program
2. Rotorcraft used for Class D must be type certificated under transport Category A (Part 29)
3. Must have direct radio intercommunications among required crewmembers
4. The lifting device must have an emergency release requiring two distinct actions
5. Specific 133 authorization for Class D is required and is authorized by the FAA via 133 Letter of Authorization A044

Prior to 2017, Class B-HEC operations were not specifically authorized by the FAA. There were no additional operational requirements to carry humans as a Class B rotorcraft load combination prior to 2017 other than unique aircraft certification requirements for the helicopter's cargo hook.

### Human External Cargo (HEC) FAA Regulations

External load attaching means (cargo hooks) for helicopters must meet the FAA's certification requirements from 14 CFR Part 27.865 or 14 CFR Part 29.865. Prior to 1999, there were no specific requirement differences between non-HEC and HEC.

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After 1999, if the helicopter external load operation involves carrying a human, additional regulatory requirements apply from 14 CFR Part 27.865(c) or 14 CFR Part 29.865(c).

In 1998, to determine if there was a need for imposing new regulations on HEC operations, the Rotorcraft Standards Directorate of the Aircraft Certification Service requested the Civil Aeromedical Institute to review all available accident databases to determine if HEC operations are unsafe or sufficiently problematic to warrant a change in the existing regulations.

The 1998 Civil Aeromedical Institute report had multiple recommendations with the critical recommendation that the helicopter have quick release ability for the long-line worker.

Additional recommendations from that 1998 report were:

- Wear brightly colored clothing
- Provide warning instructions on the HEC devices
- Provide ability to communicate with the crew members
- Have additional crew members to watch the long-line worker
- Conduct initial and recurrent training for the HEC crew
- Ensure HEC operations are specifically addressed in the regulations

The regulations prior to 1998 did not specify standards for HEC equipment or minimum competency standards for HEC crew members.

As stated in the 1998 Civil Aeromedical Institute report, at that time, there was little standardization of operations among companies and among rescue organizations performing HEC operations; and the standards discussing training for rescue operations were vague and open to interpretation. The report recommended introducing competency standards and training requirements for HEC operations and clarification for FAA approval of HEC equipment.

In 1999, specific aircraft certification regulations (14 CFR parts 27.865(c) and 29.865(c)) were introduced for rotorcraft external load attaching means for rotorcraft-load combinations to be used for HEC applications. The intent was to provide improved safety standards for HEC rotorcraft-load combination certification.

### **Secondary Attaching Device – Belly Band**

There is a secondary attaching device referred to as a belly band that is used by Part 133 operators when conducting helicopter external loads to prevent the accidental release of a person carried as an external load. This system wraps around the lower fuselage of the helicopter through the doors to form a loop. The belly band connects to both the helicopter's cargo hook and the belly band.

The FAA published an Information for Operators (InFO 12015) addressing the belly band on September 10, 2012. The belly band is also referred to as a heli-bridle, secondary attaching means, or Portable Safety Device (PSD).

The intent of the belly band is to prevent an inadvertent release. The belly band's design includes a separate jettison handle for the pilot which may not be collocated on the flight controls to rapidly release the belly band from the helicopter during an emergency.

Use of the belly band was more prevalent prior to 2017. After 2017 and following the FAA revisions to Advisory Circular 133-1 and FAA Orders, the FAA focused on HEC operations and discovered that the regulatory requirements for the external load attaching means (cargo hooks) for HEC operations were not consistently in compliance Part 27 or Part 29.

Based on a Safety Recommendation made by Robert L. McMahon on July 17, 2013, the FAA determined in 2017 that there may be misconceptions regarding the certification of HEC equipment including the use of PSDs, and a lack of training and operational procedures related to HEC operations.

In 2018, as referenced in the FAA Safety Alert for Operators (SAFO) 18004 then SAFO 18013, the FAA focused on HEC operations and worked with HEC operators to allow temporary

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exemptions from 133.43(a)(b) and 91.9(a) that would allow enough time for cargo hook manufacturers to design and obtain FAA approval for HEC compliant cargo hooks. These FAA approved HEC cargo hooks would then replace the HEC operator's non-compliant cargo hooks.

At the time of publishing this document (2024), the belly band's use is not as prevalent because the new HEC compliant cargo hooks have structure and design requirements that incorporate redundant systems, eliminating the need for the belly band. The new HEC cargo hooks comply with 14 CFR 27.865(c) and/or 14 CFR 29.865(c) as applicable.

In addition to the cargo hook compliance issues, the FAA also discovered, that operational oversight of HEC operations was inconsistent and not standardized.

FAA Order 8900.1, Volume 3, Chapter 51, Section 3 was updated to include specific guidance for FAA Inspectors related to 14 CFR Part 133 Class B HEC operations for the Rotorcraft Load Combination Flight Manual (RLCFM). This includes detailed examples for training, briefings, communications, qualifications, and other operational safety considerations.

FAA Order 8900.1, Volume 3, Chapter 51, Section 1 was also revised to include specific HEC information. Advisory Circular 133-1 was updated in 2017 and 2020 to include specific HEC information.

### **Additional Resources for Human External Cargo (HEC) operations:**

In addition to the FAA, there are local, state, and federal government agencies, private industry, and associations that have operational guidelines for HEC operations. This is a sampling of those reference documents for further research:

- U.S. Department of the Interior's Short-Haul Handbook (351 DM1)
- U.S. Department of the Interior's Law Enforcement Short Haul Policy Ver. 1.7
- U.S. Department of Agriculture Forest Service Standards for Short-Haul Operations Ver. 7.0
- National Wildfire Coordinating Group (NWCG) Publications
- Utilities, Patrol, and Construction Committee (UPAC) Safety Guide for Helicopter Operators

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Class B HEC Operation with an FAA approved hook. Source: Mike Reyno/Brent Bundy



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Photo of an HEC FAA approved cargo hook in operation. Source: Brent Bundy