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RÉPUBLIQUE FRANÇAISE

BH4X10V1

**CONCOURS EXTERNE ET INTERNE
POUR L'EMPLOI DE CONTRÔLEUR DES DOUANES ET DROITS INDIRECTS**

**BRANCHE DE LA SURVEILLANCE
SPÉCIALITÉ « SURVEILLANCE ET AÉRONAUTIQUE : PILOTE D'HÉLICOPTÈRE »**

DES 10, 11 ET 12 MARS 2010

ÉPREUVE ÉCRITE D'ADMISSIBILITÉ N°4

(DURÉE : 1 HEURE - COEFFICIENT 2)

LANGUE ÉTRANGÈRE

Traduction d'un texte technique rédigé en anglais

AVERTISSEMENTS IMPORTANTS

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Traduire en français

The tail rotor of a helicopter is mounted on the tail of a traditional single-rotor helicopter, close to perpendicular to the main rotor. It is primarily used in order to counteract the yaw motion and the torque that a rapidly turning disk naturally produces. The tail rotor in simple terms is a propeller that pushes the body of the helicopter in the opposite direction of the main rotor, preventing loss of control.

Significance

The tail rotor, stabilizing the helicopter as it does, is a crucial element of the helicopter and loss or serious damage often means immediate loss of flight control. However, by shutting down the main motor the tail rotor is no longer necessary to counteract the torque generated by the main motor and the pilot can attempt an Autorotation to get back to the ground safely.

Design variations

There are two major variations to traditional tail rotor design concerning the placement of the tail rotor and the surrounding structure. Some companies such as Eurocopter enclose the rotor within a tail assembly. Such design - called fenestron - protects the tail rotor from foreign object damage better than the traditional outer mounted design but complicates the design of the tailcone to account for the enclosed mechanisms.

New developments

Most, if not all, dual-rotary helicopters do not use tail rotors, instead, the design of the two main rotors is such that they spin in the opposite directions of each other, thus each cancels out the torque and yaw produced by the other. This has been researched in the past and has been incorporated into some European designs.

Sikorsky Aircraft, a UTC subsidiary is currently researching the merger of these two concepts with a dual rotor helicopter with a rear rotor to provide additional forward thrust and a respective increase in speed and operating range.