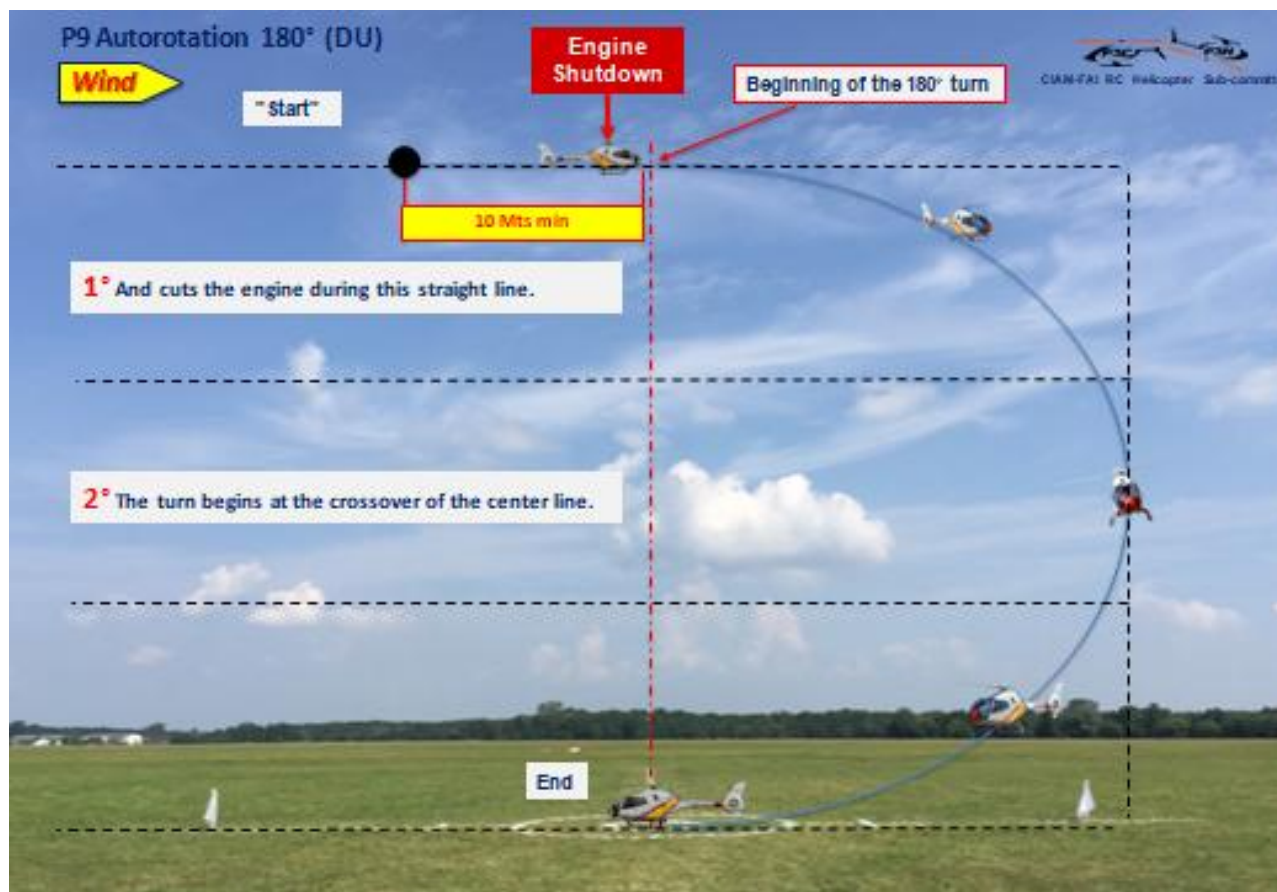


**P9 : Landing with autorotation flight and 180° turn**



**P9 : Landing with autorotation flight and 180° turn – (DU)**

**K Factor = None**

**Specificities :**

- The turn must have a constant radius.
- The descent rate must be constant to a point before the skids touch the helipad.

**Description :**

- MA flies a straight horizontal line for a minimum of 10m at a minimum altitude of 20m and stops the engine (or at idle) before the centre line.
- Then, as soon as MA crosses the centre line in autorotation flight, it immediately descends, making a 180° turn to land on the heliport, the fuselage parallel to the judges' line.

**Penalties specific to this manoeuvre:**

- In the case of a straight line during the 180° turn, this will result in a downgrade from 1 to 3 points for failure to respect the consistency of the radius length.
- If MA passes less than 2.50m in height when he is near flag 1 (2), the penalty will be 1 point minimum for not respecting the descent rate.
- If the engine is not switched off (or at idle) before the MA crosses the centre line, the score will be 0 (zero) for this manoeuvre.

**If after landing the fuselage is not parallel to the judges' line with a tolerance of 5°, this will result in a downgrade of 0.5 points.**

**Additional clarification :**

Viewed from the air, the MA's flight path must form a semi-circle, starting from the centre line and ending on the same line. This path must never be parallel to the ground or the judges' line.

**Note :** The «start» can be given 20m or more before the centre line as long as the straight line is horizontal to the centre line.

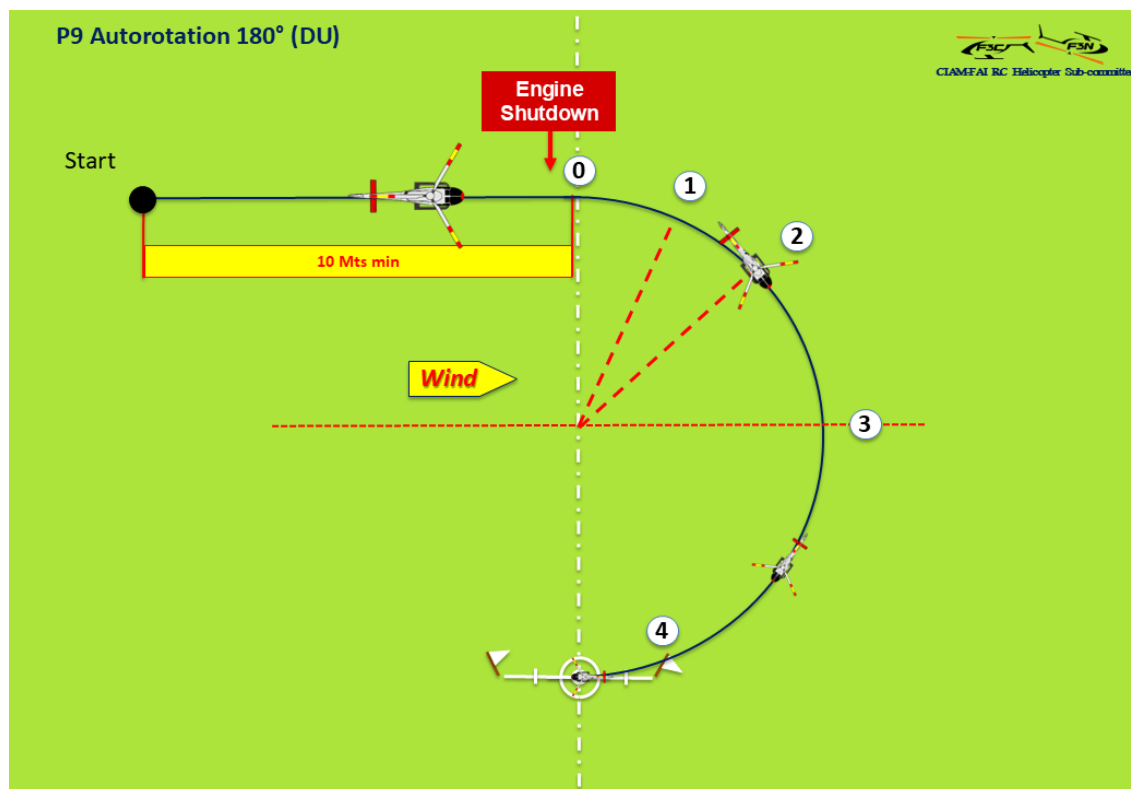
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**Comments :**

As with all manoeuvres, it's essential to study it before attempting it.

Downwind is the main enemy of this figure if it's completely calm, there won't be much lift, and if there's plenty, you'll need to anticipate certain manoeuvres.

Therefore, you'll need to be vigilant during the following four phases :



**Phase de 0 to 1 :** It is imperative to start the turn as soon as the helicopter crosses the center line because if there is a straight line during this phase, there will inevitably be another one at some point to reach the center circle with a penalty of 2 or 3 points.

**Phase de 1, 2 and 3 :** It is imperative to counter the wind which pushes the helicopter towards the outside of the recommended trajectory otherwise there will inevitably be a straight line to reach the central circle with a penalty of 2 or 3 points.

If both mistakes (phase 1 and phase 2) are made at the same time, the straight line to reach the central circle will be extremely long and the penalty will be 3 to 4 points.

**Waypoint 3 :** When the helicopter is at point 3 it should have made half the turn and have completed half the descent.

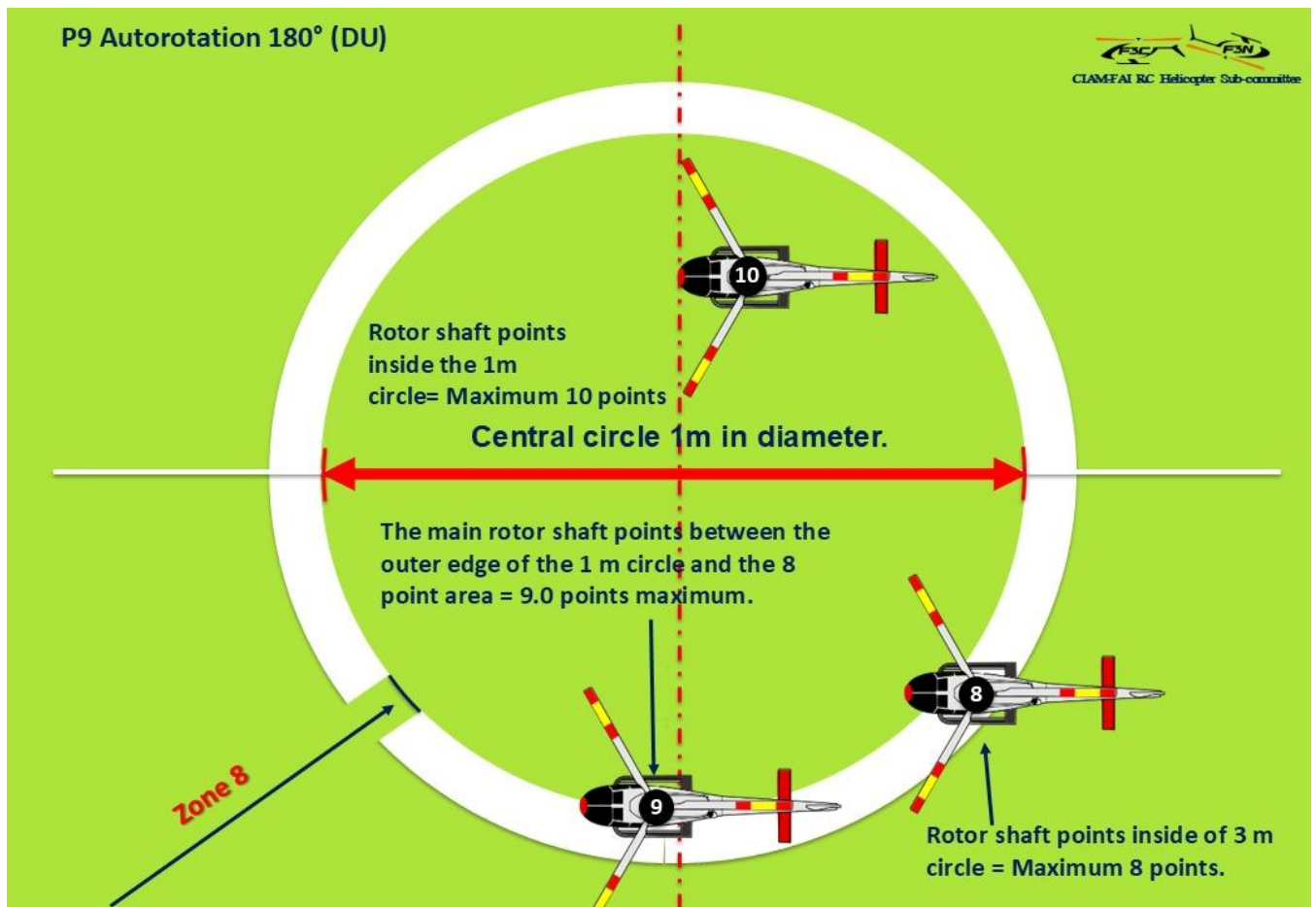
**Phase 4, near flag 1 :** The helicopter must return to the right (left) of flag 1 (2), at an approximate distance of 30 cm min to 60 cm maximum. If this is not respected the penalty will be 0.5 points. It is also necessary that at this same time it be at a minimum altitude of 2m50. If this is not respected the penalty will go from 1 to 2 points.

**Landing phase :** Be careful not to change the trajectory to land in the central circle when it provides for example a landing in the 8 point zone because for this fault the penalty is 2 points, it is calculated from the 8 points and not the 10 points where the helicopter landed, which gives:  $8 - 2 = 6$  points maximum without taking into account any faults committed before.

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Here are some examples that are correct or incorrect :

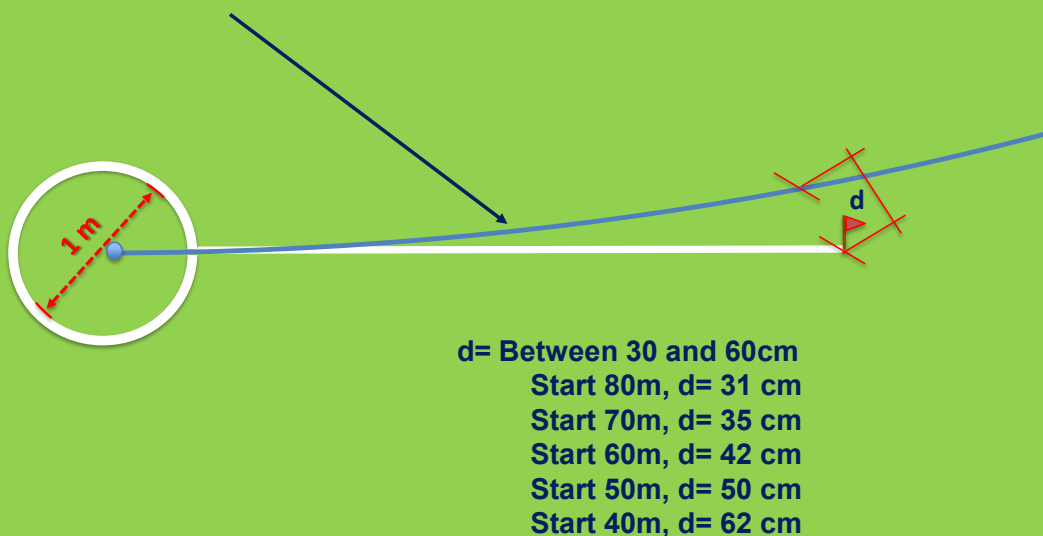
To obtain the maximum score of 10 points, the helicopter must land in the central circle with the fuselage parallel to the judges' line and provided that no fault has been made previously.



Depending on the starting depth relative to the helipad, when the helicopter passes the height of flag1, it should be approximately at a distance “d” of 30 to 60cm from flag1.

### P9 Autorotation 180° (DU)

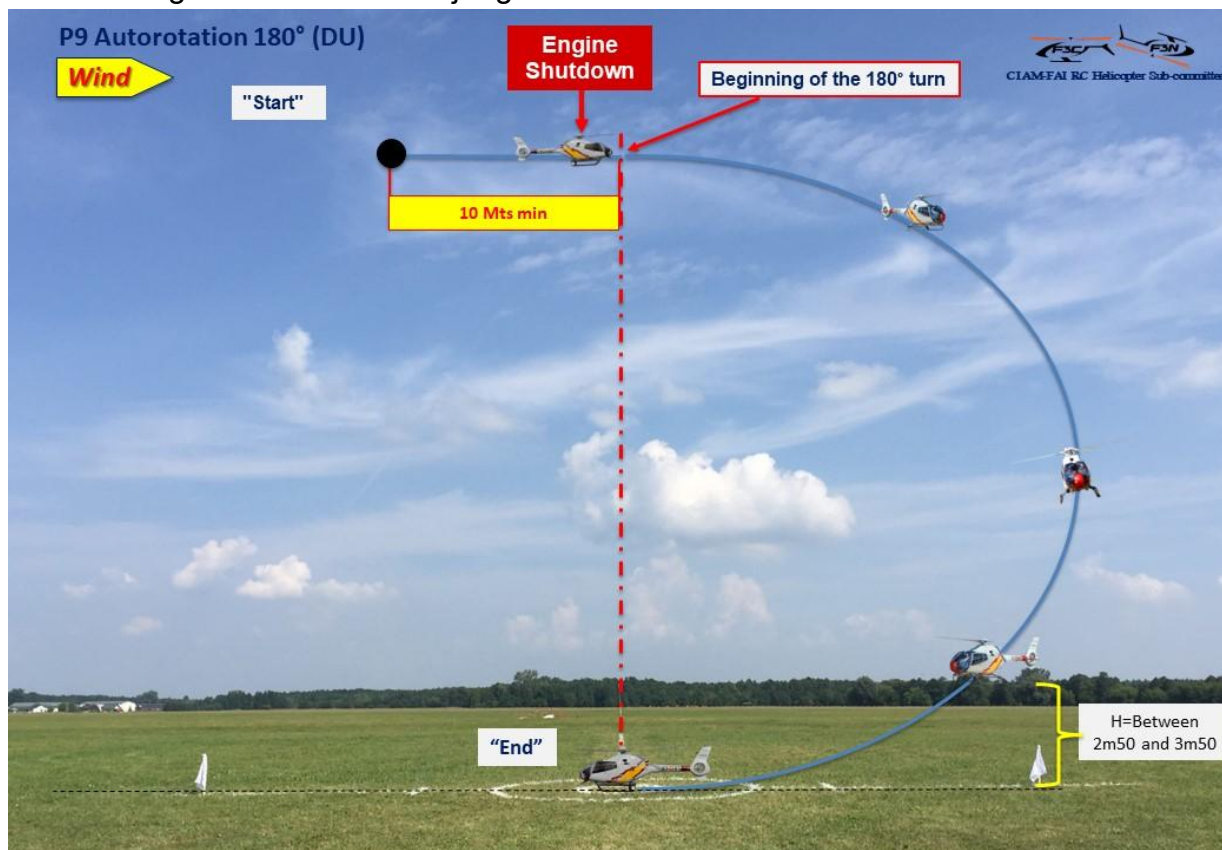
If the start of the turn is 60m from the center circle, the MA should be approximately 42cm from flag 1 when passing in front of it.



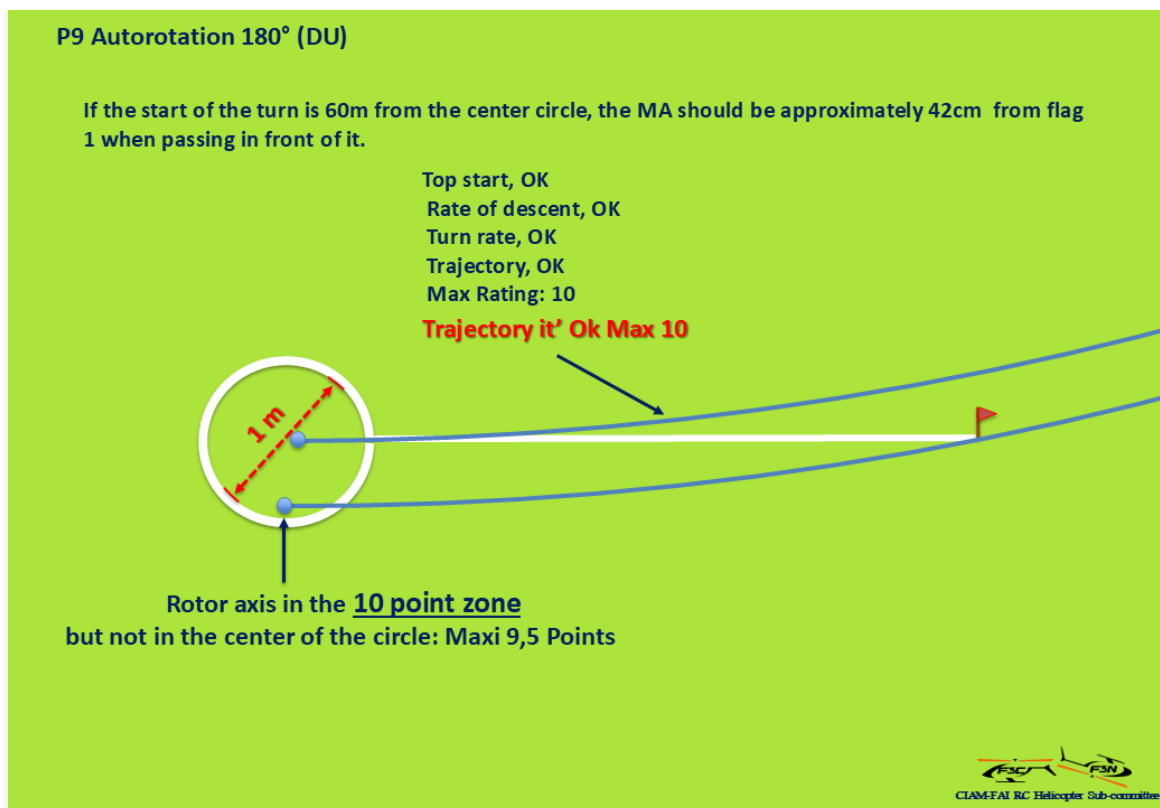
**Trajectory it' Ok Max 10**

CIAM-FAI RC Helicopter Sub-committee

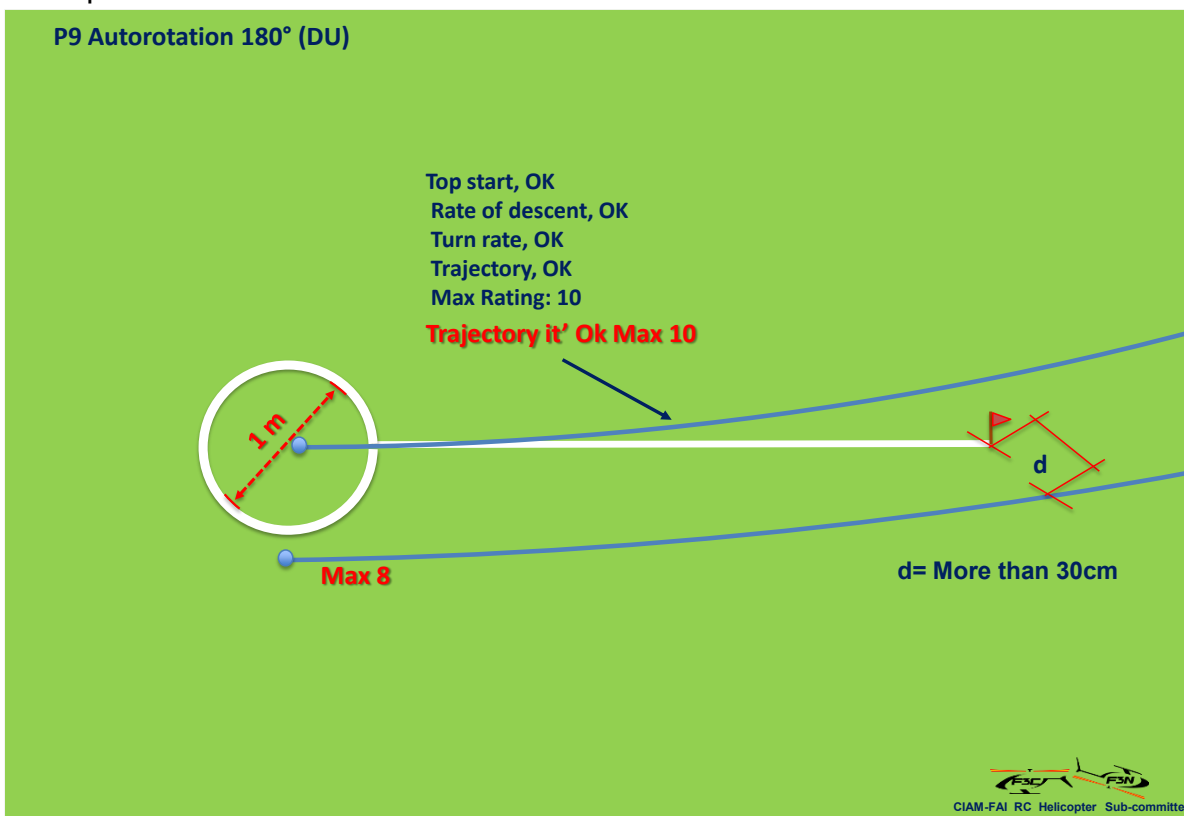
Depending on the starting altitude, when the helicopter passes near the flag1, it must be approximately at a height of 3.30-3.50m, but for penalties it must be at least at 2.50m, which leaves a large tolerance for the judgment.



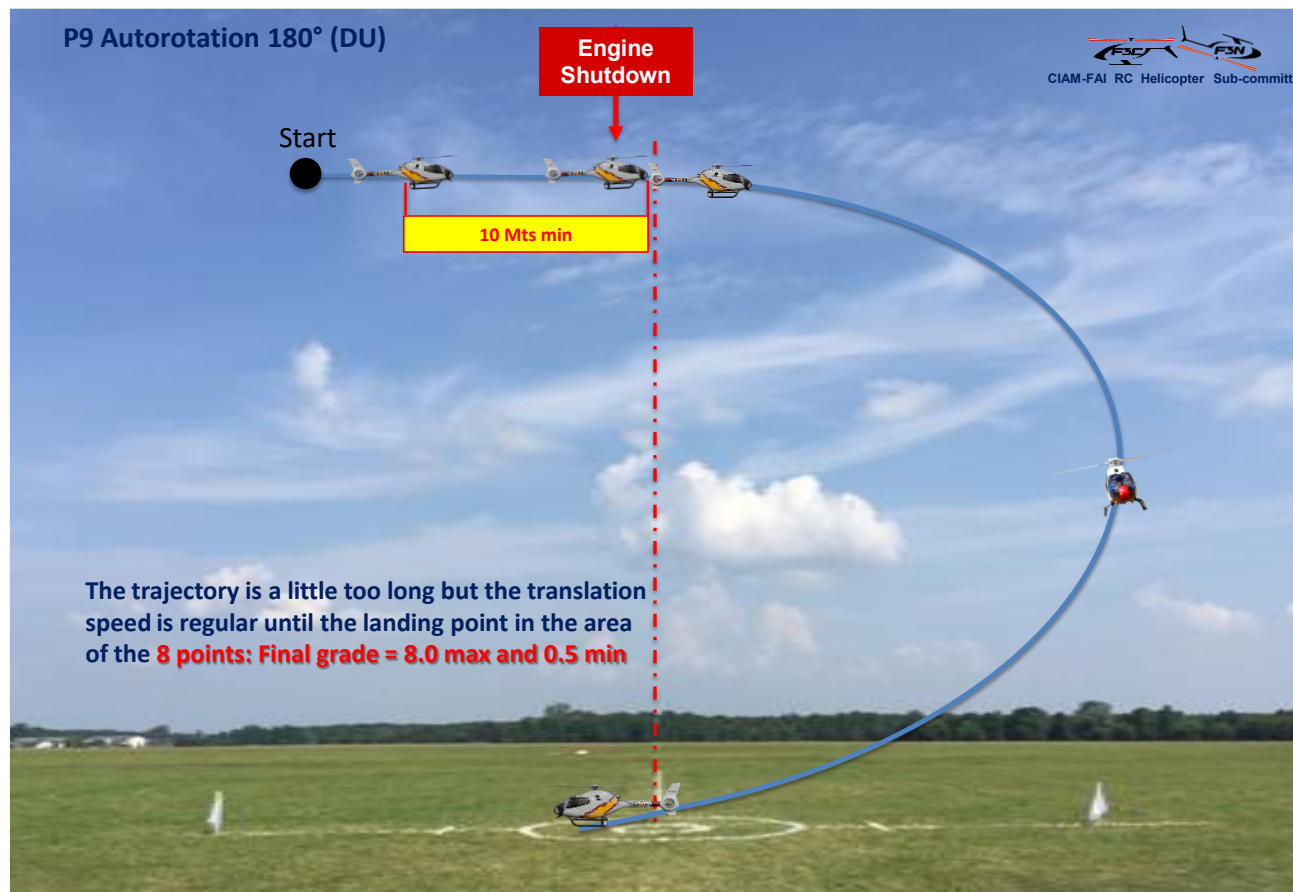
If the helicopter passes directly over flag 1(2), it can only land near the edge of the central circle. The maximum score will be 9.5 points because it did not pass to the right (left) of flag 1(2). However, if it lands in the center of the central circle, the maximum score will be 9.0 points because this would mean that it either flew in a straight line from flag 1(2) or made a turn of more than 180° or a lateral movement.



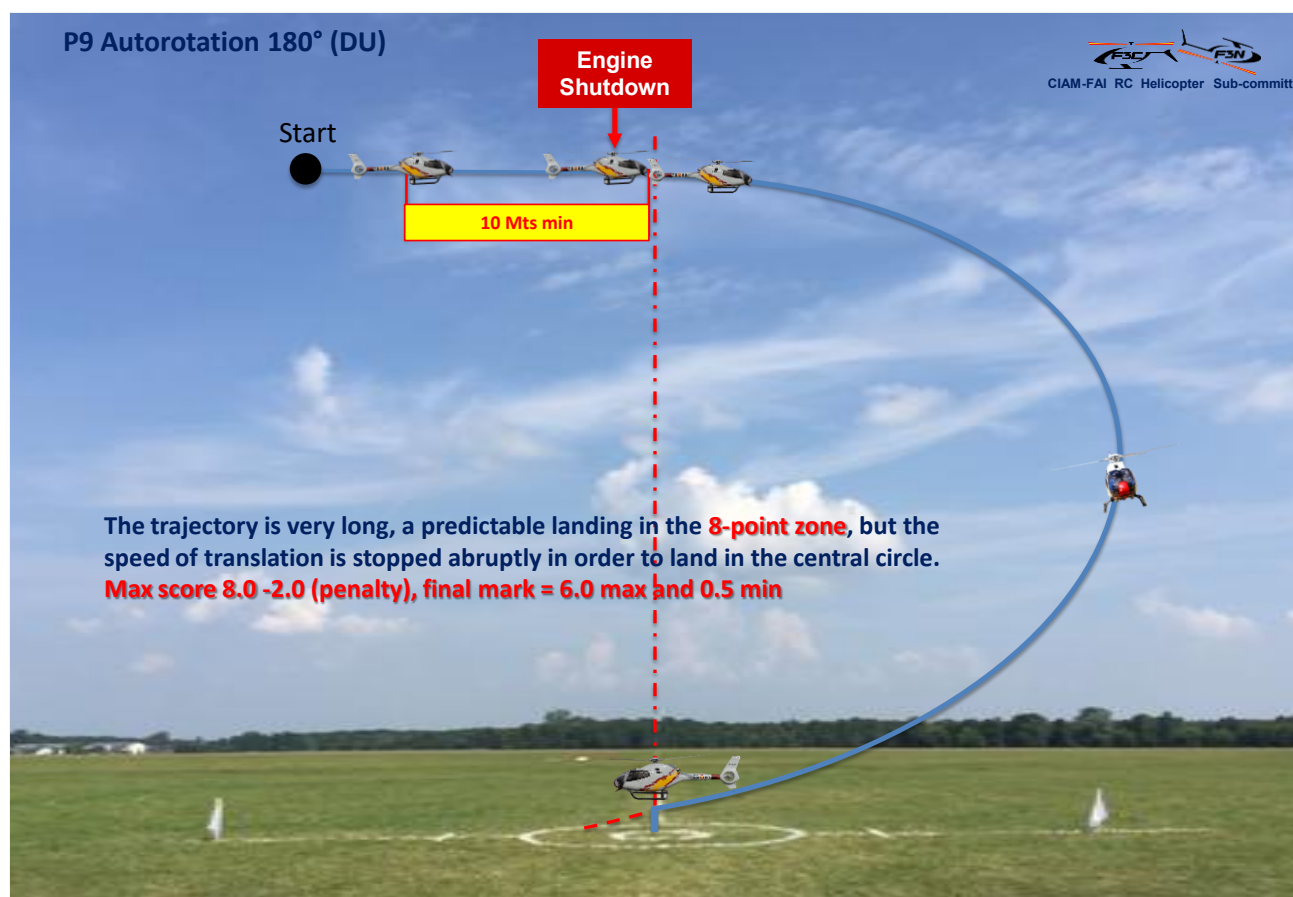
If the helicopter passes to the left of flag 1(2) by more than 25 cm, it will only be able to land in the 8-point zone.



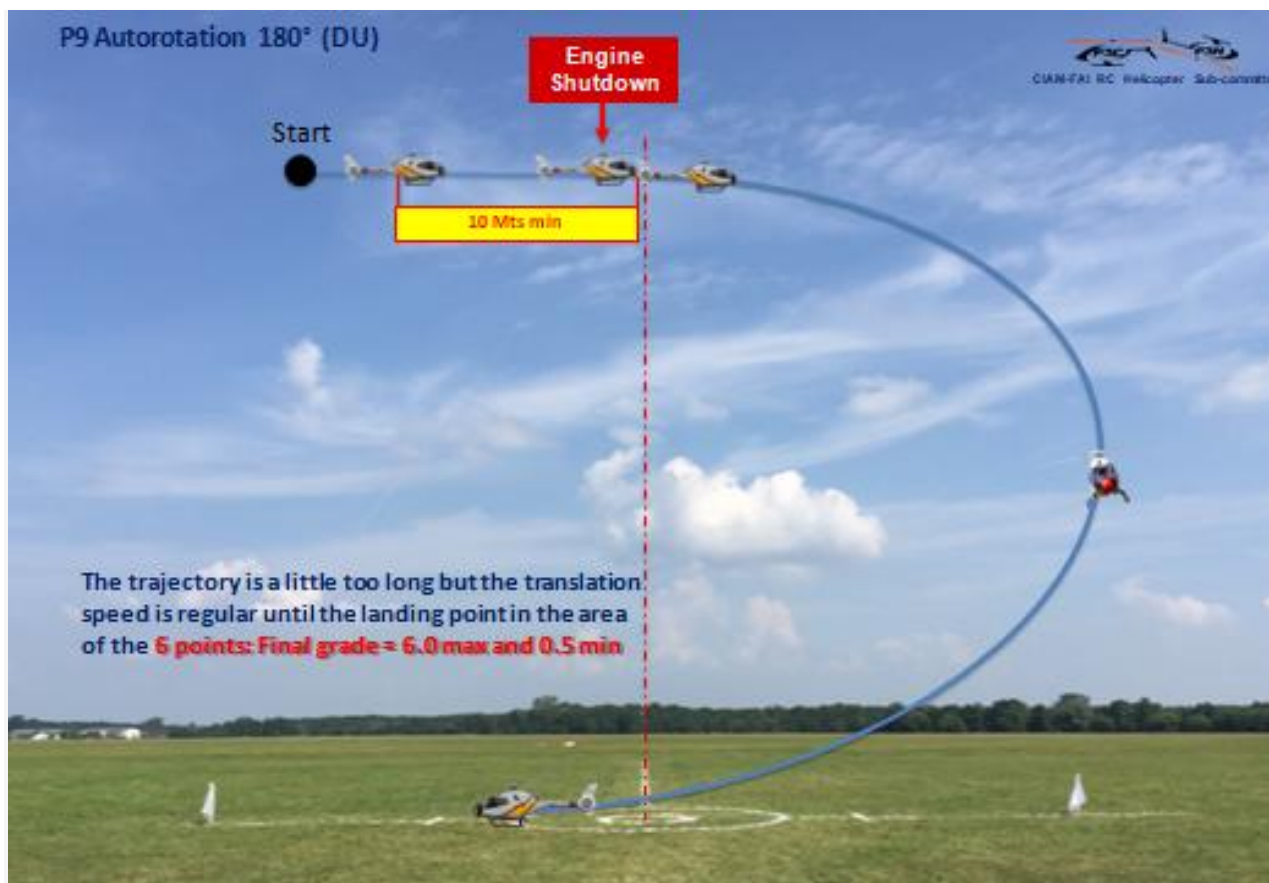
In the case below, if the trajectory is not modified the maximum score can be 8 points.



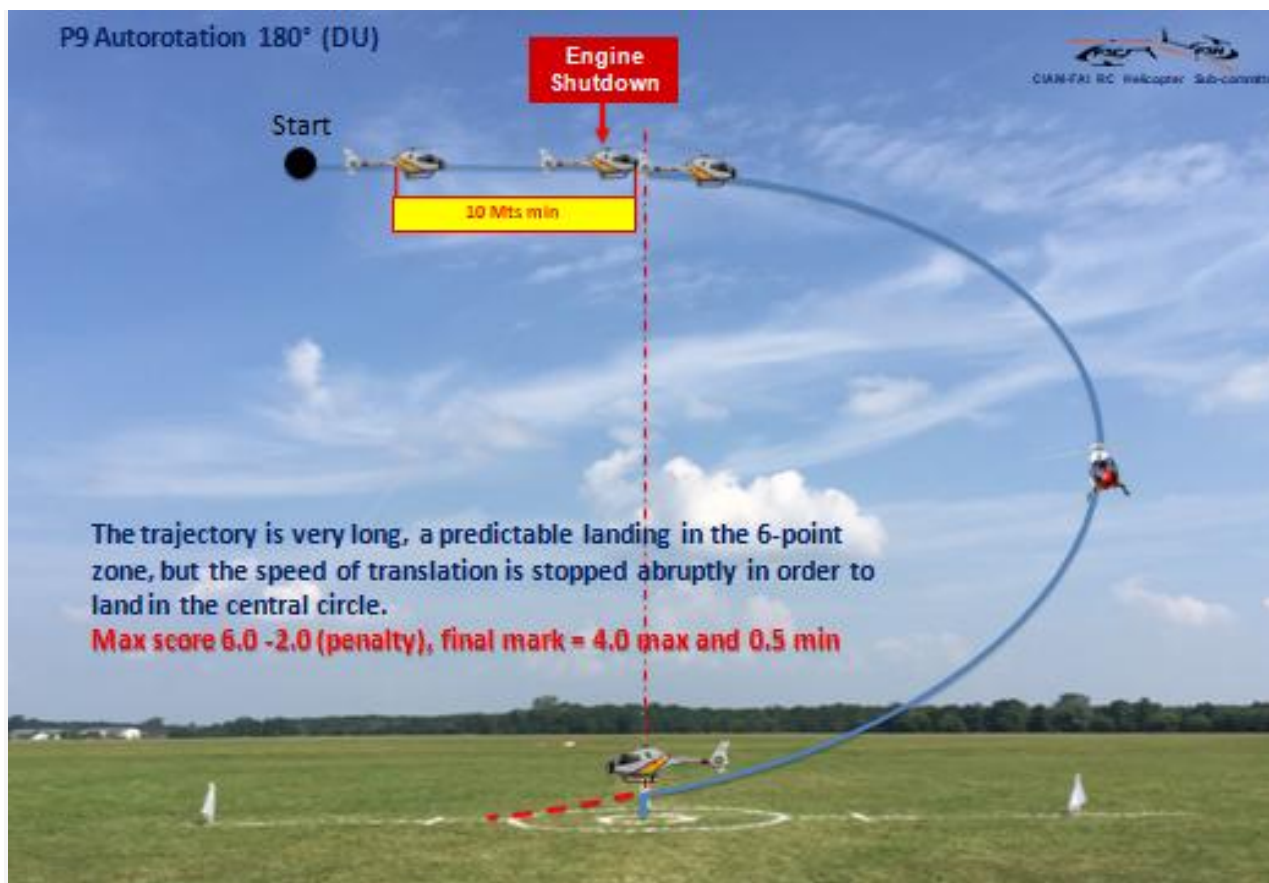
On the other hand, if the trajectory is shortened as in the case below (or lengthened) the penalty is 2 points which can only give a maximum score of 6 points.



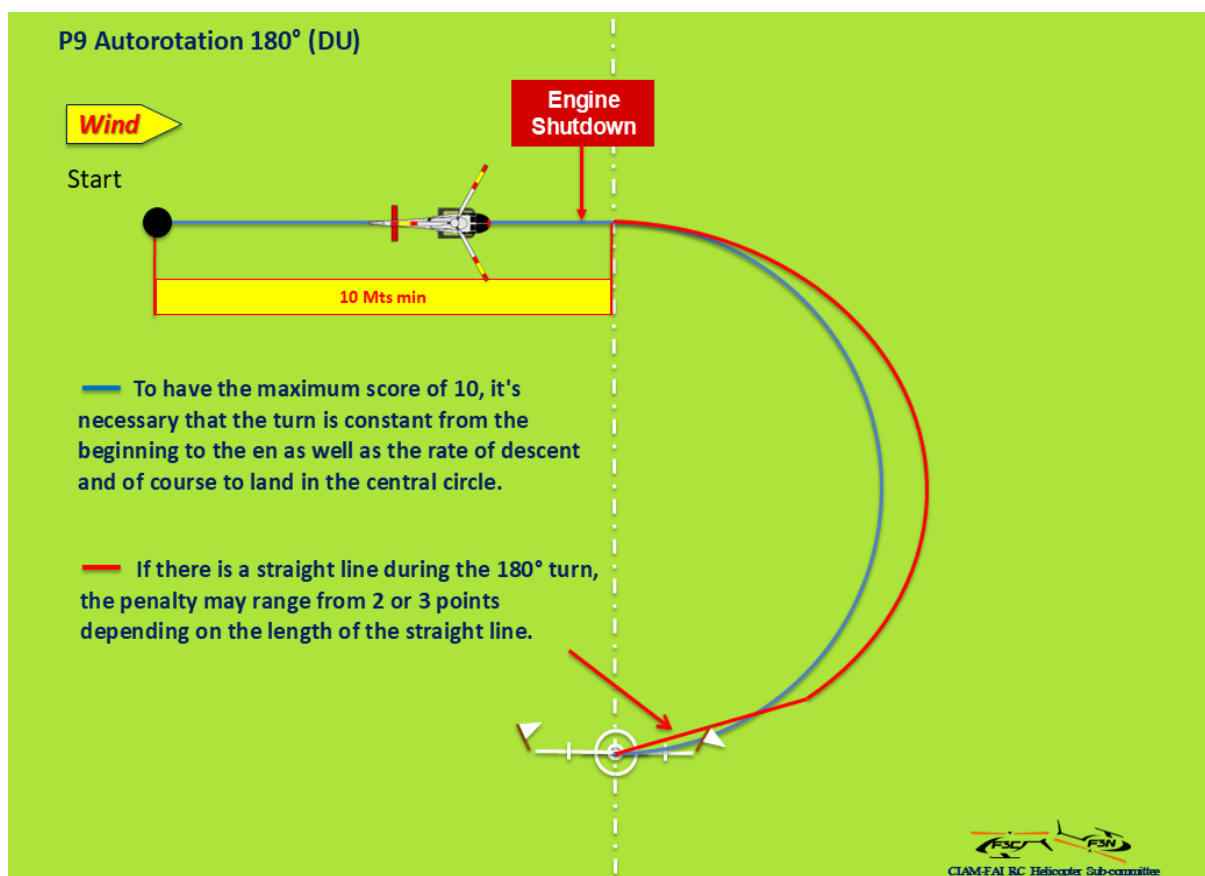
In the case below, if the trajectory is not modified the maximum score could be 6 points.



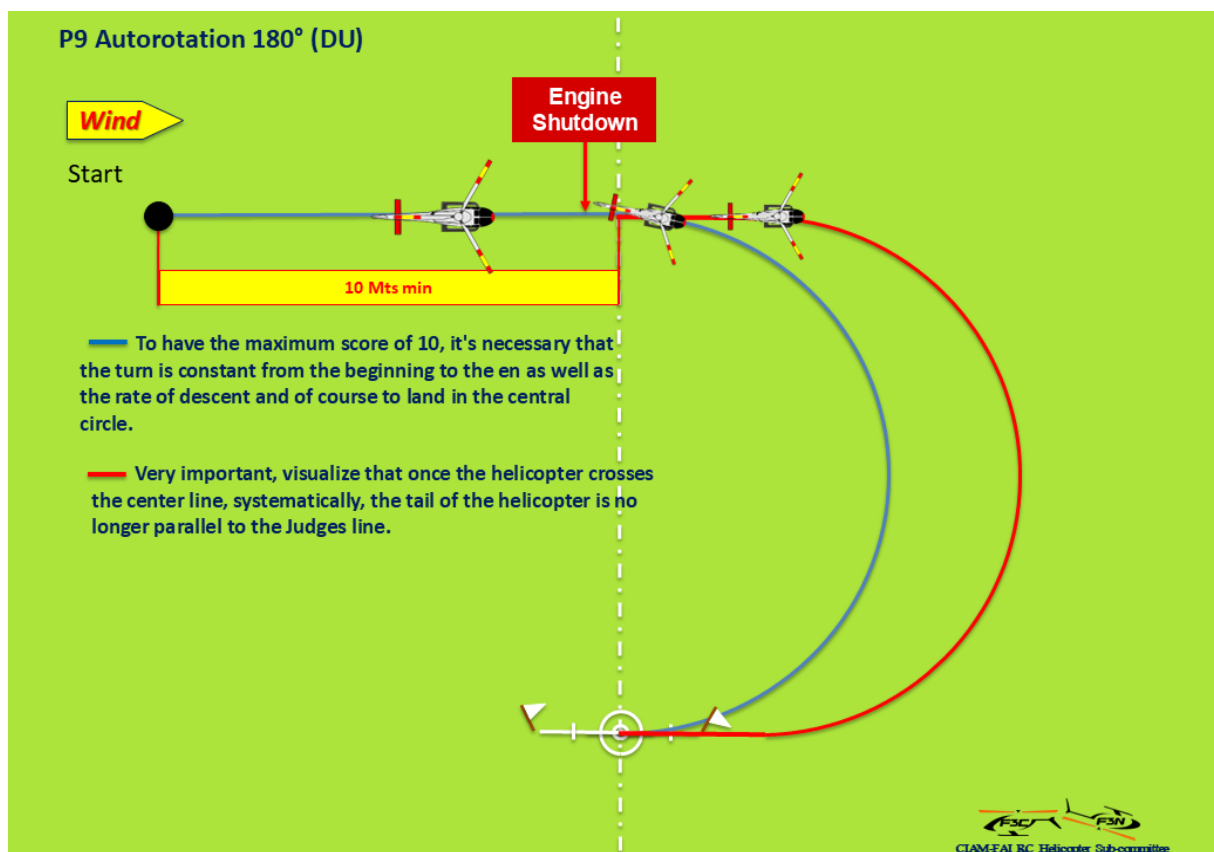
On the other hand, if the trajectory is shortened as in the case below (or lengthened) the penalty is 2 points which can only give a maximum score of 4



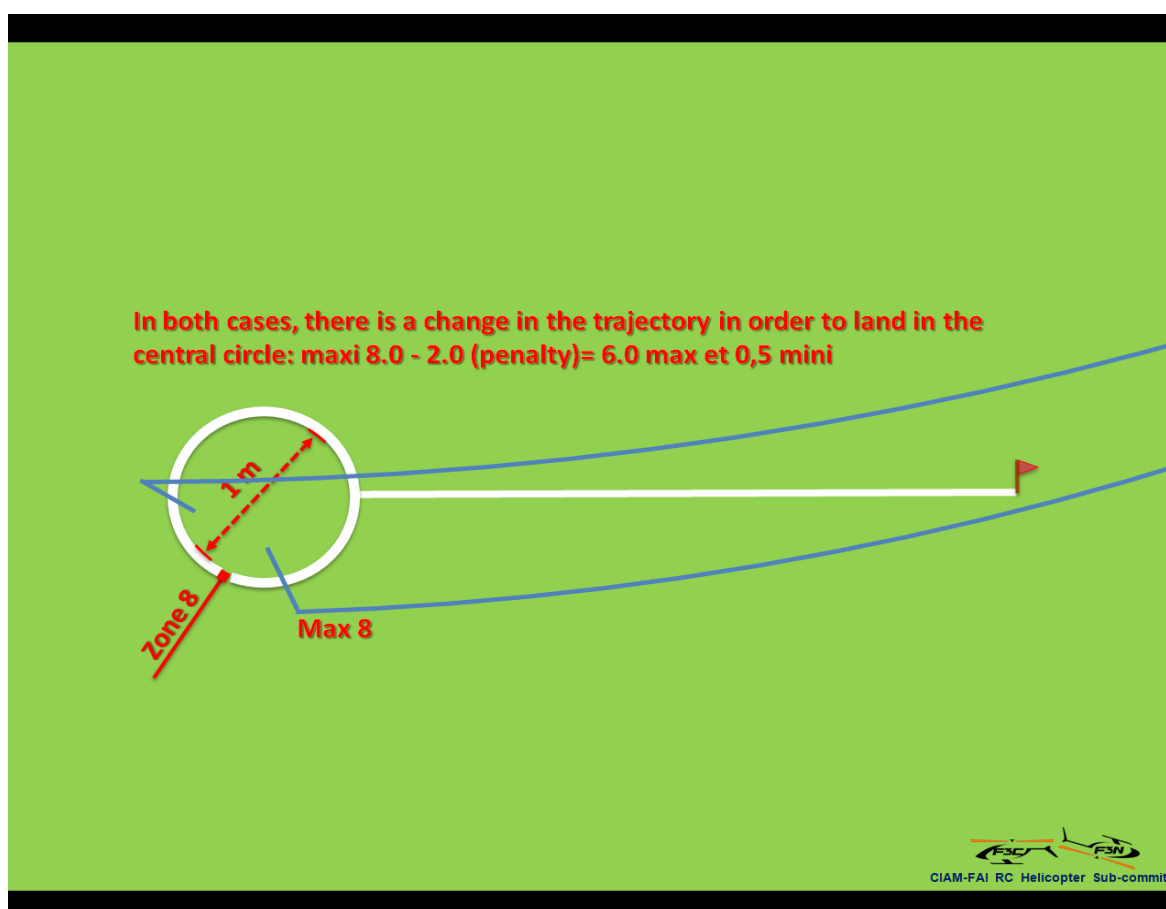
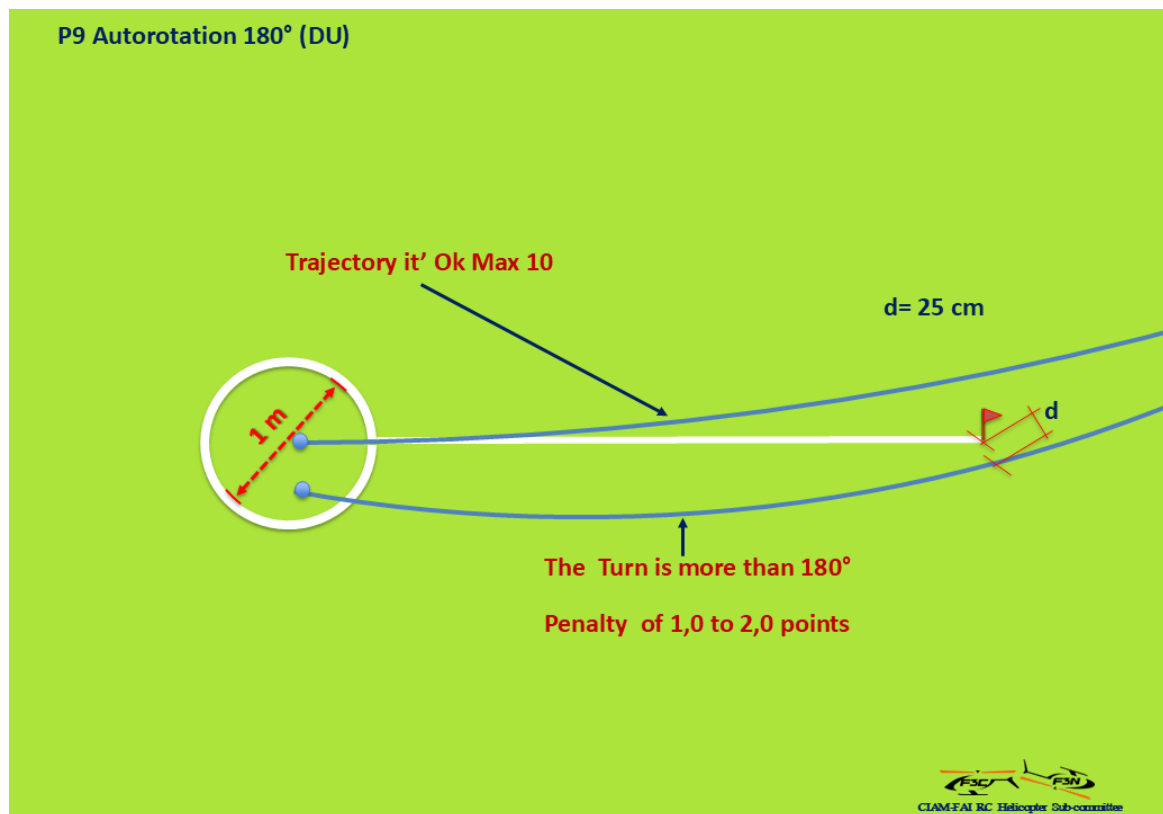
In the case below with a non-constant radius and a straight line, the penalty could be 2 or 3 points depending on the length of the straight line and the angle of the slope.



In the case below with two straight lines parallel (or not) to the judges' line, the penalty will be 3 or 4 points depending on the length of the straight line and the angle of the slope.



f the helicopter passes more than 25 cm to the left (right) of flag 1 (2), it should land at best in the 8 point zone, if it lands in the center circle, it means that it has made a turn of more than  $180^\circ$ , the penalty will be 1 or 2 points depending on the distance from flag 1 (2).



Thanks for your interest