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Title of invention:
MODULE FOR INTEGRATED APPROACH TO AN OFFSHORE FACILITY

Applicant:
Sikorsky Aircraft Corporation

Headword:

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
Novelty (no)
Inventive step (no)

Decisions cited:

Catchword:

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Case Number: T 1722/15 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 22 November 2018

Appellant: (Applicant)	Sikorsky Aircraft Corporation 6900 Main Street P.O. Box 9729 Stratford, CT 06615 (US)
Representative:	Schmitt-Nilson Schraud Waibel Wohlfrom Patentanwälte Partnerschaft mbB Destouchesstraße 68 80796 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 2 April 2015 refusing European patent application No. 09836645.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	H. Geuss
Members:	C. Narcisi
	O. Loizou

Summary of Facts and Submissions

I. European application No. EP 09836645.3 was refused by the decision of the Examining Division posted on 2 April 2015. An appeal was lodged against the decision by the Applicant on 8 June 2015 and the respective appeal fee was paid. The statement of grounds of appeal was filed on 12 August 2015.

II. Oral proceedings were held on 22 November 2018. The Appellant (Applicant) requested that the appealed decision be set aside and that a patent be granted on the basis of the main request or, in the alternative, on the basis of auxiliary requests 1 to 9, all requests filed with its statement of grounds of appeal.

III. Claim 1 (main request) reads as follows:

"A method to facilitate approach of a VTOL aircraft to an offshore facility comprising:
inputting a waypoint for a landing platform of an offshore facility into an aircraft module (50);
inputting a final approach inbound course toward the landing platform into the aircraft module (50);
the method being characterized by:
inputting an offset distance from the landing platform into the aircraft module (50);
inputting a minimum descent height, MDH, for a final descent toward the landing platform into the aircraft module (50);
determining an Initial Approach Fix, IAF, and a Final Approach Fix, FAF, in response to the waypoint, the offset distance, the final approach inbound course, and the minimum descent height, MDH, with the aircraft module (50); and

directing the aircraft to the Initial Approach Fix, IAF, in response to the aircraft module (50), wherein from the Initial Approach Fix, IAF, the final approach inbound course approaches a position which is offset to a specified side by the offset distance and above the height of the landing platform at the minimum descent height."

Claim 1 of auxiliary request 1 is identical with claim 1 of the main request.

Claim 1 of auxiliary request 2 reads as follows:

"A method to facilitate approach of a VTOL aircraft to an offshore facility comprising:
inputting a waypoint for a landing platform of an offshore facility into an aircraft module (50);
inputting a final approach inbound course toward the landing platform into the aircraft module (50);
inputting an offset distance from the landing platform into the aircraft module (50);
inputting a minimum descent height, MDH, for a final descent toward the landing platform into the aircraft module (50);
determining an Initial Approach Fix, IAF, and a Final Approach Fix, FAF, in response to the waypoint, the offset distance, the final approach inbound course, and the minimum descent height, MDH, with the aircraft module (50); and
directing the aircraft to the Initial Approach Fix, IAF, in response to the aircraft module (50), wherein from the Initial Approach Fix, IAF, the final approach inbound course approaches a position which is offset to a specified side by the offset distance and above the height of the landing platform at the minimum descent height;

characterized in that the waypoint, the offset distance, the final approach inbound course, and the minimum descent height, MDH, are set via air crew interaction during a cruise phase prior to approach initiation."

Claim 1 of auxiliary request 3 is identical with claim 1 of auxiliary request 2.

Claim 1 of auxiliary request 4 differs from claim 1 of auxiliary request 2 in that the wording "prior to approach initiation" is replaced by the wording "prior to approach initiation; and
further characterized in that the method further comprises:
determining a turn point, TP, in response to the waypoint, the offset distance and the final approach inbound course and minimum descent height, MDH, by determining an arc which intercepts the Initial Approach Fix, IAF, for alignment of the aircraft toward the Final Approach Fix, FAF; and
locating the Turn Point, TP, on the arc to tangentially intercept the arc;
directing the aircraft directly to the Turn Point, TP, after approach initiation; and
directing the aircraft along the arc from the Turn Point, TP, to the Initial Approach Fix, IAF."

Claim 1 of auxiliary request 5 is identical with claim 1 of auxiliary request 4.

Claim 1 of auxiliary request 6 differs from claim 1 of auxiliary request 2 in that the wording "prior to approach initiation" is replaced by the wording "prior to approach initiation; and

characterized in that the method further comprises slowing the aircraft to 30 KGS (knots ground speed) at said position which is offset to the specified side by the offset distance and above the height of the landing platform at the minimum decent height."

Claim 1 of auxiliary request 7 is identical with claim 1 of auxiliary request 6.

Claim 1 of auxiliary request 8 differs from claim 1 of auxiliary request 4 in that the wording "and directing the aircraft along the arc from the Turn Point, TP, to the Initial Approach Fix, IAF" is replaced by the wording "directing the aircraft along the arc from the Turn Point, TP, to the Initial Approach Fix, IAF; and
slowing the aircraft to 30 KGS (knots ground speed) at said position which is offset to the specified side by the offset distance and above the height of the landing platform at the minimum descent height."

Claim 1 of auxiliary request 9 is identical with claim 1 of auxiliary request 8.

IV. The Appellant's arguments may be summarized as follows:

The subject-matter of claim 1 is new over E3, for preprogrammed default values cannot be regarded as implying a step of "inputting", "inputting" rather consisting in facilitating an approach to an offshore platform by an active step of furnishing parameter values for the particular circumstances of the approach.
Further, "inputting" is correctly interpreted as "manually inputting by the aircrew", this being the

usual meaning of this term in the art, involving likewise an act performed in preparation for landing.

Further, it can be derived from the overall description of the application that "inputting" is correctly interpreted as "manually inputting by the crew".

Moreover, "inputting" is also interpreted as "manually inputting" according to the prior art documents (see e.g. E1, section 1.1). Therefore, "inputting" cannot be considered as being synonymous to "providing" in the context of claim 1, contrary to the view taken by the Examining Division.

In conclusion, based on a correct understanding of the term "inputting" E3 fails to disclose manual input of the offset distance and of the minimum descent height, as required by claim 1.

The subject-matter of claim 1 of the main request and of auxiliary request 2 is inventive over E3 (closest prior art) and E4.

The objective technical problem as derived from the mentioned differences consists in modifying the known approach such as to "facilitate approaches over a wider range of flight and approach conditions". The Examining Division considered instead the object of the invention as being "to generate a more flexible approach generation method", this wording already hinting at the invention in an impermissible way.

The technical effect and the advantage as provided by the method of the invention (according to claim 1) resides in that by manually inputting said four flight parameters (i.e. "inputting a waypoint for a landing

platform of an offshore facility into an aircraft module (50), inputting a final approach inbound course toward the landing platform into the aircraft module (50), inputting an offset distance from the landing platform into the aircraft module (50), inputting a minimum descent height, MDH, for a final descent toward the landing platform into the aircraft module (50)"; hereinafter designated as feature (a)) the pilot can adapt these parameters to account for particular flight conditions, such as differing weather conditions (in particular lower weather minimum operations with reduced visibility) or orientations of the platform. In addition, the overall crew workload during the approach is reduced, these parameters being input during the cruise phase (see published patent application (hereinafter designated as WO-A), page 9, lines 6-12, lines 10-12).

The skilled person starting from E3 as closest prior art would not consider document E4 in view of the stated object of the invention. The disclosure of E4 is dated from 1997 and represents older preliminary tests and trials using a differential GPS (DGPS) approach, whereas E3 is dated from 2008 and already presents a complete and fully developed "offshore helicopter approach procedure".

E4 does not suggest manually inputting aforesaid four flight parameters during the flight, for according to E4 this is done only by a flight test engineer (FTE) during a trial and test phase. E4 even states that "whilst very flexible, this arrangement was never intended to be representative of the user interface which might be considered for an operational DGPS system. To minimise the probability of incorrect data entry, it is desirable to confine to a minimum the

number parameters by the pilot to specify an approach; in the limit this would require only the entry of a destination identifier and approach direction" (E4, page 61.12).

The subject-matter of claim 1 of auxiliary request 4 is inventive over E3 and E4.

The features implied by aforesaid feature (a) and further feature (b) (i.e. "determining a turn point, TP, in response to the waypoint, the offset distance and the final approach inbound course and minimum descent height, MDH, by determining an arc which intercepts the Initial Approach Fix, IAF, for alignment of the aircraft toward the Final Approach Fix, FAF; and locating the Turn Point, TP, on the arc to tangentially intercept the arc; directing the aircraft directly to the Turn Point, TP, after approach initiation; and directing the aircraft along the arc from the Turn Point, TP, to the Initial Approach Fix, IAF") constitute both a difference to E3 and have a synergistic effect.
Indeed, both feature (a) and feature b) contribute to extending the operating conditions under which an approach is made possible, particularly by making unnecessary an overflight prior to landing, mainly in situations where such an overflight is not possible.

E4 would not be considered and retained by the skilled person (see above) and even if, said feature (b) would anyway not be obtained. Indeed, E4 clearly teaches an approach comprising an overflight (see caption of fig. 2, page 61.5), whereas claim 1 clearly excludes such an overflight (see directed "directly to the turn point after approach initiation").

The subject-matter of claim 1 of auxiliary request 6 involves an inventive step over E3 and E4.

Both features (a) and (c) (i.e. "slowing the aircraft to 30 KGS (knots ground speed) at said position which is offset to the specified side by the offset distance and above the height of the landing platform at the minimum descent height") constitute a difference to E3 (disclosing ground speeds of 60 and 80 knots at the missed approach point), both features leading to a synergistic effect. In effect, lowering of the ground speed is linked to the manual inputting of the offset distance and the minimum descent height, the position at which the aircraft reaches 30 kgs being chosen in a suitable manner for the particular operating conditions.

E3 teaches a groundspeed of 60 kts at the missed approach point (E3, 1.4.2), deviating by factor 2 from the claimed speed. E4, if at all considered by the skilled person, likewise only teaches 45 kt to 70kt ground speeds, lower speeds making the pilot's task more difficult (E4, page 61.9; page 61.10). Surprisingly, manually setting the offset distance and the minimum descent height, the slowing to 30 kgs could be achieved in a safe manner.

The subject-matter of claim 1 of auxiliary request 8 involves an inventive step over E3 and E4.

All Features (a) to (c), now included in claim 1, determine a difference to E3, as seen above. All features contribute to the technical effect to facilitate approaches over a wide range of flight and approach conditions, these features being linked in a synergistic manner. Specifically, they all cooperate to

extend the range of operating conditions where approaches are made possible.

Reasons for the Decision

1. The appeal is admissible.

2. The subject-matter of claim 1 of the main request is not new over E3 (Article 54 EPC). E3 particularly discloses said feature (a) of claim 1, i.e. inputting a waypoint for a landing platform (E3, "target location", paragraph 1.1), a final approach inbound course (E3, "selected final approach track", paragraph 1.1), an offset distance from the landing platform (E3, "minimum lateral separation", paragraph 1.1; "offset distance", figure 1-1) and a minimum descent height (E3, "minimum descent height", paragraph 1.4.1).
The Board concurs with the Examining Division's view that the wording "input" is extremely broad in scope and encompasses both a manual input as well as an input by generally "providing" flight parameters, e.g. by retrieval of data already stored in a data base or memory. This interpretation is confirmed, contrary to the Appellant's contentions, e.g. by the very use of the term "input" in prior art E3, where the pilot (or other crew member) is always explicitly mentioned in conjunction with said "input" if it is specifically intended to be a manual input (see E3, 1.1). "Input" or "entering" of other data (required by the system) by the crew is also explicitly mentioned in E3 (see E3, 1.1), thereby confirming that in E3 manual input of data is always disclosed in a specific and unambiguous manner. The same holds for prior art E4, where manual input (as opposed to merely "inputting" or "providing") by the pilot or a crew member is always clearly

specified (see E4, e.g. 6.14, page 61.12; page 61.6, right column, second paragraph).
Finally, even the present published patent application (WO-A, page 9, lines 19-23) explicitly specifies that said flight data according to aforesaid feature (a) are input by the "aircrew", thereby marking a clear difference to merely indicating that said data are only "input".
For the above reasons the subject-matter of claim 1 lacks novelty over E3, feature (a) being known from E3, the remaining features being undisputedly known from E3.

Auxiliary request 1 likewise fails, claim 1 being identical with claim 1 of the main request.

3. The subject-matter of claim 1 of auxiliary request 2 lacks an inventive step (Article 56 EPC) over E3 in view of E4 or the skilled person's common general knowledge. The subject-matter of claim 1 differs from E3 in that manual input of said parameters (according to aforementioned feature (a)) is explicitly indicated. The Board concurs with the Examining Division's view that manually inputting said flight parameters constitutes an option which lies within the customary practice of the skilled person. Starting from E3, this option would be adopted by the skilled person in view of the object of the invention defined by the Appellant (as well as in view of the object defined by the Examining Division), i.e. to "facilitate approaches over a wider range of flight and approach conditions". In effect, the skilled person would face the situation resulting from the fact that predetermined or predefined flight parameters under specific circumstances and (changing) weather conditions may not always be apt to permit an optimal approach of the

aircraft to the offshore platform. Thus, the skilled person would alternatively opt for manual input to facilitate the approach and render the approach method more flexible.
In addition, manual input of flight parameters is also explicitly mentioned as an option in E3 (see 1.1. "during the en-route phase the crew will enter the data required by the system to generate the approach, if required").

The same conclusions would be arrived at by the skilled person in view E4. E4 would be retrieved and retained by the skilled person, for its disclosure is closely and intimately related to that of E3, both dealing with essentially the same issues. E4 discloses the option of manually inputting said four flight parameters (E4, page 61.6; page 61.12) by the "user" or "flight test engineer" (FTE) and stresses that adopting an approach wherein "parameters were input to the guidance algorithms by the FTE" leads to a "very flexible" (E4, page 61.12; 6.14) arrangement. Moreover, E4 does not set any limit on the number of manually input parameters (contrary to the Appellant's view), as it merely states that "to minimise the probability of incorrect data entry, it is desirable to confine to a minimum the number of parameters input by the pilot to specify an approach: in the limit this would require only the entry of a destination identifier and approach direction". Quite to the contrary, the previous quote from E4 clearly only entails that at least two flight parameters have to be entered manually and that in principle more than two parameters can be input manually, insofar as safety concerns are adequately taken into account and addressed, e.g. by implementing appropriate technical warning systems. Therefore, in view of the object of the invention the skilled person

would combine E3 and E4 in an obvious way and adopt the approach disclosed in E4 since it undoubtedly facilitates the aircraft's approach to the platform by providing more flexibility.

Auxiliary request 3 likewise fails, claim 1 being identical with claim 1 of auxiliary request 2.

4. The subject-matter of claim 1 of auxiliary request 4 does not involve an inventive step (Article 56 EPC) over E3 in view of E4 or the skilled person's common general knowledge. This subject-matter differs from E3 in that said flight parameters (see feature (a)) are input manually and further differs by aforementioned feature (b).

The Board concurs with the Examining Division's view (see appealed decision, page 10) that "since the arrival segment is in most cases not directed towards the same direction as the first segment of the approach trajectory, i.e. the final approach inbound course, the aircraft would generally have to make a turn on an arc such as defined in the second difference feature of claim 1 in order to fly along the approach trajectory disclosed in E3." Hence feature (b) (as does feature (a)) lies within the customary practice of the skilled person.

Further, feature (b) (as does feature (a)) would also result from the obvious combination with E4 (see point 3), given that E4 discloses both for the older "Aerad" (weather radar approach) and for the DGPS (differential GPS) approach the same arrival segment and inbound turn (see figures 2 and 6), the inbound turn comprising an arc segment leading directly to the turn point and from the turn point directly to the

initial approach fix. The obvious combination of E3 and E4 would also be suggested by the initial approach fix and final approach fix as described in E3 (figure 1-1) and E4 (figure 6) having a similar and almost identical vertical and horizontal profile.

Finally, no synergistic effect can be seen arising from the combination of features (a) and (b), as both feature (a) and feature (b) merely independently and separately contribute (in a known manner) to extending the operating conditions under which an approach is made possible, the total effect resulting from features (a) and (b) being merely the sum of the separate effects produced by these features. Moreover, an overflight of the platform prior to landing is not excluded by the claimed subject-matter.

Auxiliary request 5 likewise fails, claim 1 being identical with claim 1 of auxiliary request 4.

5. The subject-matter of claim 1 of auxiliary request 6 does not involve an inventive step over E3 in view of E4.
This subject-matter differs from E3 in that said flight parameters (see feature (a)) are input manually and further differs by aforementioned feature (c).

The Board concurs with the Examining’s division view that feature (c) (implying 30 kts ground speed) would result (as does feature (a)) from the obvious combination of E3 and E4 (see point 2). In effect, E4 discloses that approaches were flown at 65 kts and 45 kts ground speed (E4, page 61.10) and even at 50 kts and 40 kts airspeed, corresponding according to E4 (see page 61.10) to 35 kts and 25 knots groundspeed. As stated in E4, “the pilot task was difficult at this

lower speed, as airspeed control required considerable attention" and considering that aircraft stability may get worse at lower airspeeds. Nonetheless, it would be obvious for the skilled person that under given circumstances (e.g. favourable weather conditions and appropriate approach conditions) such a lower airspeed may be selected if correspondingly adapted flight parameters according to feature (a) are input manually. This would also contribute to attain the object of the invention, given that a lower ground speed at landing would facilitate the approach, providing the pilot with more time to perform the landing manoeuver, as would anyway be obvious for the skilled person.
Again, features (a) and (c) do not lead to a synergistic effect since they both contribute independently and separately (in a known manner as suggested by E4) to achieve the object of the invention, it being generally known that in principle lower ground speed can facilitate the approach and that manual input of flight parameters likewise facilitates the approach (by increasing flexibility). The effect of combining features (a) and (c) is no more than the sum of the effects of each separate feature.

Auxiliary request 7 likewise fails, claim 1 being identical with claim 1 of auxiliary request 6.

6. The subject-matter of claim 1 of auxiliary request 8 does not involve an inventive step (Article 56 EPC) over the obvious combination of E3 and E4 (see point 2). This subject-matter differs from the disclosure of E3 in that said flight parameters (see feature (a)) are input manually and further differs by aforementioned features (b) and (c). For the above stated reasons (see above points) features (a), (b) and (c) would result from the obvious combination of E3 and E4 and the

combination of these features does not produce a synergistic effect, each feature contributing independently and separately (in a known way as suggested by E4) to achieve the object of the invention.

Auxiliary request 9 likewise fails, claim 1 being identical with claim 1 of auxiliary request 8.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman:

A. Vottner H. Geuss

Decision electronically authenticated