


<b>EASA</b>	<b>COMMENT RESPONSE DOCUMENT</b>
	<b>EASA PAD No. 09-059</b> <b>[Published on the 24 April 09 and officially closed for comments on the 30 June 09]</b>

**Commenter 1 : Air Contractors (Ireland) Limited - Brendan Smyth - Tue 05/05/2009**

**Comment # 1**

"While we agree that the measures proposed in PAD 09-059 might contribute to an increased level of safety, the installation of the MPC will be financially onerous for most operators. We find the motivation in the PAD to be contradictory and even somewhat anti competitive.

***EASA response:***

***Explanations provided in answers 2, 3, 4, 6, 10, 11, 13, 18, 19, 20, 29 and 31 below.***

**Comment # 2**

"Can the Agency please quantify the expected increased level of safety/reduction in accident rate?"

***EASA response:***

***An analysis of nine icing related accidents/events involving loss of control of the aircraft on non APM equipped ATR42/72s was performed based on Flight Data Recorder (FDR) registrations. The analysis performed showed:***

- On 5 out of these 9 cases the Aircraft Performance Monitoring (APM) would have provided anticipated alerts to the flight crew previous to the aircraft loss of control.***
- On 1 out of 9 cases the APM would have provided alerts to the flight crew when they had just already initiated the severe icing escape procedure.***

- *On 1 out of 9 cases it could not be determined with precision if the APM would or not have provided anticipatory alerts.*
- *On 2 out of 9 cases the APM would not have provided anticipatory alerts because of the specific aircraft selected configuration at the moment of the event or because other factors.*

*In addition to these 9 cases for which this APM analysis was performed based on available FDR data there are other 13 additional events on ATR42s/72s aircraft involving aircraft loss of control while in icing conditions since 1987.*

*The rate of such kind of occurrences in non APM equipped ATR42/72 aircraft seems to have stabilised over the recent years, irrespective of the different measures taken both at the aircraft design level and AFM content. However because the frequency of occurrence of these events, which can lead to a potentially hazardous situation remains above that for similar types, EASA considers further action is necessary.*

*It is noted that since ATR Mod 5866 was certified at the end of 2005, the APM has been installed on all new ATR42/72s aircraft as standard equipment. Today, around 250 ATR42/72 aircraft are flying with the APM incorporated (both on new delivered aircraft and through retrofit) this represents nearly 25% of the entire ATR42/72s fleet. Since then there have been no reported events to EASA (or ATR) concerning aircraft loss of control while in severe icing conditions involving ATR42/72 equipped with APM.*

*Therefore EASA considers that the retrofit of the APM advisory system on ATR42/72 fleet will contribute to a reduction in the rate of occurrence of loss of control events in icing conditions.*

### **Comment # 3**

"The MFC-APM may be a safety enhancement but it is not established as such. The fact that two airlines have it installed on their fleets is interesting but not evidence of its effectiveness. We ask that an independent assessment be performed."

### **EASA response:**

*EASA considers the analysis mentioned on answer to Comment # 2 above addresses this question.*

### **Comment # 4**

"The very nature of installing a system in the flight deck to improve Crew awareness can lead to over reliance on that system and lack of actual awareness. This could create an unsafe condition. Has this risk been evaluated?"

**EASA response:**

*Current ATR42/72s AFM Emergency procedures for Severe Icing will remain valid and unchanged. It is clearly explained on the PAD that it is flight crew responsibility to be aware of Severe Icing conditions and apply strictly those procedures. Both flight crew and Air Operators organizations responsibilities and obligations will remain the same. The APM is an advisory system whose purpose is to enhance the flight crew situational awareness with regards Severe Icing conditions. Service experience indicates that lack of crew situational awareness on non-APM equipped a/c is a contributory factor to the loss of control events, so the evidence is that the existing cues are not strong enough for all circumstances.*

**Comment # 5**

"Currently, there is a variety of means to determine when severe icing is encountered. In progressively deteriorating conditions we could envisage the situation where, ignoring the normal clues, a crew will not react decisively because the APM has not annunciated the "Increase speed" alert. The APM needs a theoretical 28% drag increase to trigger the warning and an aircraft could be in trouble long before that, particularly if an ice contaminated tailplane stall (ICTS) is imminent."

**EASA response:**

*See answers to Comments # 2, 3 and 4 above and to Comment # 6 below.*

**Comment # 6**

"The APM does not offer alerts once flap is selected for approach. This is the most critical phase of flight in icing conditions with an ICTS being a specific risk."

**EASA response:**

*It is true that currently the APM on ATR42/72 do not cover the full operational envelope of the aircraft (when flaps and/or landing gear are extended).*

*However Current AFM Limitations for ATR42/72s does not allow performing any holding with flaps extended while in icing conditions. In addition the approach and landing phases of the flight represent a small proportion of the total flight time.*

**Comment # 7**

"The PAD states that all commuter type A/C are at risk from severe icing conditions and that although the ATR meets the design specifications, the safety issue is crew awareness and subjective interpretation of visual clues. Crew awareness and subjective interpretation of visual clues applies to all aircraft types. This PAD is therefore uniquely punitive to ATR operators."

**EASA response:**

*This PAD has been issued by EASA for the specific case of ATR42/72s aircraft, taking into account factual data, specific reported in-service experience and finally the analysis mentioned on answer to comments #2 and 3 above.*

**Comment # 8**

"What is the effect of an incorrect selection of A/C gross weight by the crew? Has this risk been evaluated? What were the results of any FMEA?"

**EASA response:**

*As with all flight management systems the APM requires crew to enter correct data. The consequences of crew entering incorrect data have been evaluated against the requirements of part 25 and the associated failure modes and safety assessments have been found to be compliant*

*APM has to perform a take-off weight computation at the beginning of the flight and for this to happen flight crew must enter the a/c weight through the APM rotary selector while the aircraft still on ground and before the flight. ATR42/72 AFM's and FCOM's take these into account and call for the flight crew to perform this task (entering take-off weight on the system) during final cockpit preparations. Any change of rotary selector during flight will have no effect. In case the flight crew forget to introduce the a/c weight at the proper time or introduces a wrong data an APM failure will be triggered in the absence of consolidated weight data.*

**Comment # 9**

"...what will the MMEL provisions be for dispatch with an inoperative APM?"

**EASA response:**

*Current ATR42/72 MMEL ATA chapter 31 already takes into account the dispatch conditions with MPC and /or MFC modules inoperative for aircraft equipped with these systems.*

*In addition these MMEL dispatch conditions make specific mention to do not dispatch the aircraft with such systems inoperative into known or forecasted icing conditions.*

**Comment # 10**

"With other safety enhancing equipment initiatives such as TCAS and TAWS, the system specification was issued to the industry enabling several equipment manufacturers to develop solutions. This gave the operators a wider choice in terms of solutions, cost and functionality. By mandating installation of the SAGEM MPC under various ATR SB's, EASA are giving commercial benefit to ATR and SAGEM and denying operators a choice of solutions."

**EASA response:**

*See answer to comment # 7 above.*

*Nothing avoids for a third party organization not being the original TC holder to develop an alternative solution to the APM on ATR42/72 as is approved today and apply then to EASA for the approval of this design change, as far as this proposal satisfy all the requisites that current Part 21 (Reg 1702/2003) is imposing both on the aircraft design change itself and on the organization eligible to apply to EASA for such design change.*

*If this design change alternative provides the same or better level of advisory information than the current APM on ATR42/72, it could be then considered by EASA valid as an Alternative means Of Compliance (AMOC) with this AD.*

**Comment # 11**

"As the name suggests, the Multi-Purpose Computer has several modules and can perform many optional functions one of which is the Aircraft Performance Monitoring module. For many operators the installation of the MPC will be carried out with only the APM module active. This is an extremely expensive and wasteful solution. It would be better to offer operators an APM only solution. A generic APM specification should be released to allow other manufacturers to develop solutions which could be approved under AMOC."

**EASA response:**

*See answer to comment # 10 above. In addition, it is up to the affected operators to request the current TC holder if it is possible to develop a new specific alternative design solution covering only the APM module for this solution to be certified by EASA as an approved design change and accepted as a valid AMOC to this AD.*

**Comment # 12**

"Are there any provisions to issue an ETSO for Aircraft Performance Monitors?."

**EASA response:**

*No.*

**Comment # 13**

"Aircraft that have previously been operated in the USA will most likely have a SAGEM AFDAU installed under an STC to comply with FAR 121.344. The ATR SB's will not be applicable to these aircraft and an AMOC will be required. As this will involve a design from scratch will the agency consider extending the deadline for compliance?"

**EASA response:**

*See answers to comments #10 and #11 above. In addition after considering the comments numbers # 18, 19, 20, 29 and 31 EASA has decided to extend the compliance time for the retrofit with APM of the ATR42/72 aircraft to 6 years but no later than the second "C" check after the effective date of the AD,*

**Comment # 14**

"For aircraft operating with an EHS exemption from Eurocontrol, will installation of the MPC also mandate installation of an EHS compliance solution?"

**EASA response:**

*Eurocontrol's exemptions are not under EASA responsibility.*

*In any case the PAD compliance time is long enough to cover a substantial period of the EHS exemption time (if not all) granted by these Eurocontrol exemptions.*

**Commenter 2 : Delta Engineering - John A. Moritz - Wed 20/05/2009**

**Comment # 15**

"Proposed Airworthiness Directive (PAD): 09-059 indicates that the Aerospatiale ATR-42 and ATR-72 aircraft are compliant with current certification envelope for flight into known-icing-conditions. Therefore, this PAD is requiring compliance with a certification criterion other than that provided by current regulations. This PAD does not provide the new minimum regulatory standards or new certification criteria. Delta Engineering request that the new minimum regulatory standards or new certification criteria first be generated and provided before or as part of the issuance of an Airworthiness Directive."

**EASA response:**

*See answer to Comment # 7 above.*

**Comment # 16**

"The APM does not change the aircraft's ability to cope with the severe icing conditions but may provide the flight crew awareness of the severe icing conditions and expects the flight crew to comply with the existing Airplane Flight Manual. Meaning, flight crew compliance with the existing Airplane Flight Manual provides an adequate level of safety and ensuring the flight crew does not delay compliance with the Airplane Flight Manual provides an adequate level of safety.

The aforementioned conditions indicate that the operator should update their procedures and provide updated training to ensure proper compliance with the Airplane Flight Manual."

**EASA response:**

*See answer to Comment # 7 above.*

**Commenter 3 : Airlinair - BOULLET Cédric - Fri 29/05/2009****Comment # 17**

"To be complied with this PAD, we must install two systems: MPC system & APM system.

At this time, all aircrafts in AIRLINAIR fleet list have a MODE-S (EHS) exemption in accordance with the no availability of EHS DAP because MPC is not installed (see EUROCONTROL requests & configurations for ATR).

At this time, this exemption has no time limit.

If we install MPC system, we become availed at MODE-S (EHS) and we must install this system. The overcost of this modification is 10 000,00€ by A/C."

**EASA response:**

*See answers to comments # 10, 11, 12, 13 and 14 above.*

**Comment # 18**

"Several aircrafts in AIRLINAIR fleet list have a lot of STC (QAR systems, TCAS systems). These STC may be not compatible with MPC installation SB by ATR. This PAD requires us to remove all systems installed by STC and re install this same systems by ATR SB.

- For 3 aircrafts in our fleet list the over cost is estimated at 250 00, 00€ per A/C plus the MPC & APM installation. For theses aircrafts equipped with TCAS system installed with STC (not recognized by ATR) the total main hour to install all equipments to be in accordance with this PAD is about 1500 M/H. It is not possible to ground an aircraft for such a long time.

- For 17 aircrafts in our fleet list the over cost is estimated at 1 000, 00€ per A/C.

We should consider incorporating the modification during the heavy maintenance checks (for ATR the heavy maintenance checks is 8 years).

NOTE: AIRLINAIR is requesting an AMOC to install this system with an alternative solution or AIRLINAIR is expecting much more time than four years to spread the cost of these modifications (this request concerns 3 aircrafts out of a fleet of 25 aircrafts)."

**EASA response:**

*See answers to comments # 10, 11, 12, 13 and 14 above. EASA accepts to extend the compliance time for this PAD as explained in answer to comment # 13.*



**Comment # 19**

"In this difficult economic environment, we ask you for a postpone of two years for the purposes of this AD. The embodiment of this AD is estimated, for an aircraft in ATR standard at 75 000, 00€ per aircraft. The global cost to be complied by this AD for our 25 aircrafts is estimated to 2 900 000, 00€."

**EASA response:**

*Accepted. See answers to comments # 10, 11, 12, 13, 14, 18, 19, 20, 29 and 31*

**Comment # 20**

"Technical crews are very well trained in icing conditions met in flight. An important sensitizing is carried out at each recurring training on ground. Severe icing incidents were always controls by the crew concerned. Severe icing procedures are well-known of all technical crew. The flight safety board also takes part in the most of symposium or meeting about "ICING" given by the authority with an aim of informing AILRINAIR crews on the last studies related to icing."

**EASA response:**

*See answer to comment # 2 above.*

*In addition, a recent survey performed by an operator among their ATR42/72 pilots revealed that a significant number of them ignored / were not aware of specific details in the current ATR AFM regarding severe icing encounters, including for example that if any loss of aircraft control / uncommanded roll is observed during icing conditions, 15° flaps should be extended to help recover control of the aircraft. This survey led to the French BEA making a recommendation to EASA and ATR, as a consequence of this recommendation a process for improvement on current ATR42/72 AFM was triggered.*

**Commenter 4 : Aer Arann – Gerry Butler - Wed 24/06/2009**

**Comment # 21**

"PAD 09-095 states: "Because the APM warning will only indicate the significant aerodynamic penalties, the current AFM Emergency Procedures for severe icing remain totally valid. No relief to the pilot procedures concerning the current visual cues to detect severe icing conditions can result from this AD because APM function provides flight crews with objective indications which complement and enhance the situation awareness". This indicates that AD No F-1999-015-040 R2 requirements, with the current AFM instruction on visual cues, ice formation on the unheated portion of either forward\*window etc., remains the primary source of severe ice detection. Therefore, if the AFM conditions, imposed by AD F-1999-015-040 R2 are adhered to the APM alerts should not occur. PAD 09-059 is proposed to become an AD yet the original AD F-1999-015-040 R2 still stands. If this first AD is always adhered to why would there be a requirement for a second AD to be mandated and issued on the same matter?"

**EASA response:**

*See answer to comment # 2 above.*

**Comment # 22**

"Is it possible that the APM system could promote flight crew over dependency or complacency in the observation of severe icing conditions with the use of the APM as the ultimate indicator of the limit of operations in severe icing conditions, rather than the primary visual cues of ice accretion?"

**EASA response:**

*See answers to comments # 4 and 8 above.*

**Comment # 23**

"Can the system be considered foolproof? For instance, what happens to the APM calculations in a situation where the crew enter an incorrect take off weight (lower weight=higher alarm threshold) or, prior to encountering sudden icing conditions, the flaps are already extended, at which point the system is disengaged?"

**EASA response:**

*See answers to comments # 4, 6 and 8 above.*

**Comment # 24**

"The cost of retrofitting the entire, and in many cases aging, ATR fleet will be a serious practical and financial burden to ATR operators. The ATR will be particularly disadvantaged when it is considered that other commuter aircraft types which may also experience such severe icing conditions (as explained in

PAD 09-059, "Reason") will not be similarly mandated. As the entire Multi Purpose Computer has many other functions not necessary for performance monitoring which obviously impacts on the final cost of delivering an APM system, has consideration been given to any alternative acceptable means of compliance?

\*Note: Should paragraph 4 of "Reason" section in the PAD read: "...visual cues like covering unheated portion of either forward side windows..." The word "side" is missing."

**EASA response:**

*See answers to comments # 10, 11, 12, 13, 14, 18, 19, 20, 29 and 31.*

*Comment regarding missed word "side" on paragraph 4 of "Reason" noted.*

**Comment # 25**

"Aer Arann believes that upholding the requirements of DGAC AD No F-1999-015-040 R2 should continue. Aer Arann, while acknowledging that the APM system could be an enhancement, does not believe that the APM/MPC system has been categorically proven to a level that should mandate the introduction of this Multi Purpose Computer fleet wide. EASA are requested to consider that the compliance status for modifications 05567+05592+05630, installing an MPC, should remain at Recommended and not made Mandatory through the introduction of this (Proposed) Airworthiness Directive."

**EASA response:**

*See answer to comment # 2 above.*

*In addition see answers to comments # # 10, 11, 12, 13, 14, 18, 19, 20, 15, 29 and 31.*

**Commenter 5 : ATR – D.CAILHOL - Mon 29/06/2009**

**Comment # 26**

"PAD/AD Title

The intent of the AD is to mandate the installation of the Aircraft Performance Monitor. Hence the AD title should only mentions the installation of that system and reference to the associated AFM supplement should be removed for the following reasons:

□ The installation of any new system automatically implies an update of the associated operational and maintenance documentation as usual for any aircraft configuration changes. All the ATR Aircraft Flight Manuals (AFM) already provide the operational procedures to be followed once the Aircraft Performance

Monitor is installed.

- Mentioning an AFM revision within the AD title may lead to the confusion that this AD calls for additional requisite on the ATR42/72 already equipped with the APM, which is not the case.
- The APM is an advisory system and it shall be clear that the prevailing AFM content are the current Limitation and Emergency Procedure sections related to severe icing.

A note related to the AFM content could be added in the AD "required action" to remind that the supplement n°15 of the AFM chapter 7 is related to the APM operational use."

**EASA response:**

*Accepted. See answer to comment # 4.*

**Comment # 27**

**"Applicability**

The applicability should be limited to the aircraft not already equipped with the MPC/APM. As already provided in ATR note DO/TC-0814/09 - Proposition of data for drafting PAD, the applicability should be as follows:

Aircraft not already with the Multi Purpose Computer (MPC):

- ATR42-200/-300/-320 not equipped with mod. n° 08420 or SB ATR42-31-0071
- ATR42-400/-500 not equipped with mod. n° 05567 or SB ATR42-31-0068
- ATR72 not equipped with mod. n° 05567 or 08367 or 08442 respectively SB ATR72-31-1051 or SB ATR72-31-1047 or SB ATR72-31-1054.

The following aircraft have been delivered with the MPC (modification n° 05567) which includes the APM function:

- ATR 42-500 from MSN 641 and over;
- ATR 72-212A MSN 699, 722, 724, 726 and over

The ATR42-500 and ATR72-212A that will be equipped with the new avionics suite will all have the MPC/APM installed in production but through different modification numbers. If the above aircraft MSN are not excluded from the AD applicability next produced aircraft may appear to be not compliant with the AD as the MPC will be installed through different modifications."

**EASA response:**

*Partially accepted.*

*Concerning ATR42/72s aircraft to be equipped with new "Glass Cockpit" avionics suite, this Major Significant change is still on going and pending to be EASA approved. Once this certification process is finished an AMOC with this AD could be granted or even the AD could be amended to make*

*reference these aircraft will be equipped with the APM through another different Mod number and therefore not affected by this AD.*

#### Comment # 28

##### "Reason

The proposed wording in the PAD reflects the analysis we did from the past events. Even if the APM further improves the flight awareness in case of inadvertent severe icing encounters, the ATR design, the primary visual means and the established procedures have been demonstrated as being adequate to cope with such encounters. Analysis of post Roselawn incidents clearly shows that for most of the cases the flight crews had identified at least one severe icing cue but failed to apply the established operational procedures.

In that view ATR considers that it is not a design issue but rather lack or inappropriate training that should be addressed with an operational directive.

Furthermore severe icing environment and potential for requirements have been addressed in the Ice Protection Harmonization Working Group task by the ARAC. It appears that ATR aircraft already comply with these future requirements still to be published. By mandating the installation of the Aircraft Performance Monitoring the Agency will discriminate the ATR models compared to other turboprops. Nevertheless, ATR agrees on the beneficial enhancement of icing awareness provided by the APM, and considering a recent icing event involving other aircraft, ATR would like EASA to consider rulemaking activities related to low speed alert devices for all turboprops types."

##### EASA response:

*Concerning the ATR42/72s case see answer to comment# 2. EASA opinion is that it is not only a matter of crew do not following appropriate AFM procedures after they correctly identified the severe icing conditions but also a combination of other factors like a late identification/awareness of the existence of these severe icing conditions or even no identification at all of aircraft has entered such conditions.*

*Regarding the second part of the comment, this PAD was raised based on in service experience data specific for ATR42/72s. In any case EASA takes note of the recommendation concerning activities regarding low speed alert devices.*

#### Comment # 29

##### "Compliance time

The MPC/APM is installed on production aircraft since July 2005 and available for retrofit since June 2006. Current status indicates that among the 778 ATR in operation, 250 are equipped with the MPC/APM (148 in production and 101 through in service retrofit) About 520 aircraft are still to be retrofitted. Among these remaining aircraft several of them have been modified by several STC's that will prevent the installation of the MPC/APM necessitating the study and development of numerous adaptations. More than 100 aircraft that have been equipped with FAR121.344 STC fall in this category. Other incorporate STC related to T2CAS, Flight Management System or various navigation tools that have changed the basic configuration.

Installation of the MPC/APM can only be done after accomplishment of several steps:

- Upon operator request, assessment by ATR of the aircraft configuration,
- ATR to determine the necessary adaptation to make the MPC/APM installation possible
- Design and approval of the relevant design changes (either by ATR or by an STC holder)
- Installation of these adaptations and of the MPC/APM

ATR believes that all these steps cannot be achieved over the proposed 4 year period and that the compliance time should be extended to 6 years, at least. This will provide an equivalent "C" check (based upon the average fleet yearly utilization a "C" check is equivalent to 2.5 to 3 years), for the configuration assessment and the design of the necessary adaptation then another "C" check to retrofit the adapted MPC/APM system. Furthermore a compliance at 6 years will allow several operators to install the MPC/APM during a more adapted "8 Year" heavy check without stretching unnecessarily a "C check", by nature limited in MH's and in disassembling."

**EASA response:**

*Agreed. See answers to comments # 18 and 19. Compliance time has been extended (see answer to comment # 13).*

**Comment # 30**

**"Required actions**

The service bulletins ATR72-31-1047 and ATR72-31-1054 have been developed to specifically address the aircraft operated by Mount Cook and their applicability is limited to the Mount Cook fleet whose all aircraft have already been equipped with the APM for the in service evaluation.

Then to address the remaining fleet it is sufficient to mention the following service bulletins:

- ATR42-200/-300/-320 : SB ATR42-31-0071 revision 7
- ATR42-400/-500 SB: ATR42-31-0068 revision 7
- ATR72 all models: ATR72-31-1051 revision 8

Then as explained in section 1, a note could be added to mention the appendix 15 of the AFM related to the operational use of the APM."

**EASA response:**

*Agreed. In case these past options developed by ATR for a specific operator will be applicable to any ATR42/72s aircraft under a specific configuration, an AMOC could be requested to comply with this AD by making use of these specifically fitted retrofit solutions.*

**Comment # 31****"Economical consideration**

The here below economical consideration does not account for the potential supplementary design adaptations/STC that will be necessary to cover aircraft configurations not considered by ATR (STC aircraft).

**Man-hours**

The applicable Service Bulletins give a man-hour estimate at 300 MH provided the work is performed by trained personnel and no difficulties are encountered during the installation. According to the in service experience from previous installation, the average total man-hours is close to 400 MH while the full installation will last 10 days.

With a fleet of 520 A/C, 400 average man-hours per aircraft and 50€/MH, the labor costs reach 10.4 Millions of Euros.

**Material costs (kits)**

Average kit cost is today around 40,000€ then the total material costs reach 20.8 millions of Euros.

**.Aircraft ground time**

Average elapse time is 10 days for the complete MPC/APM installation including the functional test. The fleet retrofit will be equivalent to 5200 days (i.e. 173 months) while an average aircraft rental represents 50,000€ per month. Thus the total aircraft ground time would cost 8.7 millions of Euros.

**Total Costs**

The introduction of MPC/APM modifications on ATR operating fleet will have a total estimated cost to the industry of some 40.0 Millions of Euros, not considering the costs of design and Kits for that part of the fleet covered by different STC's.

**Induced cost**

Several European operators have received derogations from Eurocontrol to not install the enhanced surveillance on their aircraft as the related design changes were too heavy. Once the MPC is installed on ATR, the installation/activation of the enhance surveillance is easier and the concerned operators will loose these exemptions. Extra costs associated to the enhanced surveillance installation will then have to be considered."

**EASA response:**

*EASA is aware of these economical issues. See answers to comments # 10, 11, 13 and 14 above.*

*Concerning several of these comments above (#10, 11 and 12) regarding a potentially less expensive APM solution, easier to retrofit and without the associated additional features already provided by MPC, the extra compliance time provided now in the AD (see answer to comment # 13) should be enough in order to develop, test and certify this option and request an AMOC regarding this AD.*

*Now it is up to the industry to analyse if this alternative APM option is feasible, convenient and advantageous but knowing this will be a company decision that could not be accepted as a rationale to ask in the future for more extensions with this AD compliance time in case these potential solution finally does not provide a valid result or is not developed at the end.*

**Comment # 32**

"Although ATR agrees that the MPC/APM installation will enhance icing cockpit awareness, we estimate that due to the heavy costs that our Operators will sustain - today evaluated at some 50.0 Millions of Euros (retrofit plus "induced" costs) this AD will seriously put ATR at a disadvantage with respect to the competition. Also, the large costs of this modification (50.0 Millions of Euros over 500 aircraft) may lead to some serious profitability considerations on lower MSN aircraft.

In addition, an analysis of 10 icing events concluded that the APM would have provided sufficient warning of speed decay to crew in 50% of cases, missing for various reasons the other 50%.

For what above (fairness to competition, high costs, STC aircraft, 50% reliability), ATR considers the issue of an AD as a too strong action and it let think that there is a design issue when it is an operational issue. Nevertheless, should the AD be maintained, ATR would like EASA to consider rulemaking activities related to low speed alert devices or other active means for all turboprops types."

**EASA response:**

*See answers to comments # 28 and 31 above.*

*EASA does not fully agree with the conclusions of the APM analysis as extracted by ATR regarding "reliability". See answers to comment # 2. Reliability figures are higher than 50% and these on the basis of analysis of 9 specific cases on non APM equipped ATR aircraft for which FDR data were available.*