COMMENT RESPONSE DOCUMENT (CRD) TO ADVANCE-NOTICE OF PROPOSED AMENDMENT (NPA) 2007-11

on possible course of action for EASA to address the residues that can result from application of

"De-icing/anti-icing fluids"

Explanatory Note

I. General

1. The purpose of the Advance Notice of Proposed Amendment (A-NPA) 2007-11 of 31 July 2007 was to consult stakeholders on the appropriate measures to be taken in order to address potential safety hazards associated with the residues of fluids used for the ground de-icing and anti-icing of aircraft. It was the intention to use the outcome of the A-NPA consultation to define an EASA action plan to address this issue and more particularly the recommendations from accident investigators.
2. In this Comment Response Document (CRD) the European Aviation Safety Agency (the Agency) briefly discusses the outcome of the consultation and the conclusions that could be drawn from them before presenting its general policy and action plan concerning the issue. When rulemaking will be necessary, Notices of Proposed Amendments (NPAs) will be published for comments.
3. The Agency is directly involved in the Rulemaking Process. It assists the Commission in its executive tasks by preparing draft regulations, and amendments thereof, for the implementation of the Basic Regulation[1] which are adopted as "Opinions" (Article 19(1)). It also adopts Certification Specifications, including Airworthiness Codes and Acceptable Means of Compliance and Guidance Material to be used in the certification process (Article 19(2)).
4. When preparing its rulemaking activities the Agency is required to follow a structured process as described in the Rulemaking Procedure[2]
5. This rulemaking activity had been included in the Agency's 2007 programme at the request of the EASA Advisory Board[3] in response to safety concerns raised by the UK Air Accidents Investigation Branch (AAIB), the German Federal Bureau of Aircraft Accident Investigation (BFU) and the aviation industry. It represents the rulemaking task MDM.040.

II. Consultation

6. Advance-Notice of Proposed Amendment (A-NPA) 2007-11 of was published on the web site (www.easa.europa.eu) on 31 July 2007. By the closing date of 31 October 2007, the Agency had received 139 comments from 28 national authorities, professional organisations, and private companies.
7. The commentators background:

Category	Commentator
Airlines (7)	Association of European Airlines (AEA)
	CityJet
	European Regions Airline Association
	Flybe
	Malmo Aviation
	REGIONAL
	REGIONAL COMPAGNIE

[1] Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.03.2008, p. 1).

[2] Management Board decision concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material (Rulemaking Procedure), EASA MB 08-2007, 13.6.2007.

[3] EASA Advisory Board, letter to EASA Executive Director, EAB/00063, 1.9.2006.

Service providers of de-icing/anti-icing (3)	Airline Services
	D-ICE
	Northport
Professional associations (4)	Aircraft Engineers International (AEI)
	Association of Dutch Aviation Technicians
	SNMSAC Syndicat National des Mécaniciens Sol de l'Aviation Civile
	European Cockpit Association
Standardisation bodies (1)	SAE (Chair of Residue Workgroup)
Airports (1)	FRAPORT AG
Aircraft Manufacturers (4)	Airbus
	Boeing
	Bombardier
	Cessna Aircraft Company
National Aviation Authorities (5)	Austrocontrol
	DGAC France
	Swiss Federal Office of Civil Aviation (FOCA)
	Transport Canada Civil Aviation Standards Branch
	UK CAA
Other (3)	Francis Fagegaltier Services
	Thomas Helman
	Peter G Richards

Table 1: List of commentators to A-NPA 2007-11

III. Publication of the CRD

8. All comments received have been acknowledged and incorporated into this Comment Response Document (CRD) with the responses of the Agency.

9. In responding to comments, the following standard terminology is used:

- **Accepted** – The comment is agreed by the Agency and any proposed amendment is wholly transferred to the revised text.
- **Partially Accepted** – Either the comment is only agreed in part by the Agency, or the comment is agreed by the Agency but any proposed amendment is partially transferred to the revised text.
- **Noted –** The comment is acknowledged by the Agency but no change to the existing text is considered necessary.
- **Not Accepted** - The comment or proposed amendment is not shared by the Agency.

10. Stakeholders may for two months after the publication of this CRD submit to the Agency any possible reactions regarding possible misunderstandings of the comments received and answers provided.

11. Such reactions should be received by the Agency not later than 3 November 2008 and should be submitted using the Comment-Response Tool (CRT) at http://hub.easa.europa.eu/crt.

IV. Result of the consultation

12. The purpose of the A-NPA was to obtain input from stakeholders on the development of appropriate measures to be taken in order to address potential safety hazards associated with the residues of fluids used for the de-icing and anti-icing of aircraft. This was triggered by several Safety Recommendations made by Accident Investigation agencies on this subject, including the UK Air Accident Investigation Branch (AAIB) and the German Federal Bureau of Aircraft Accident Investigation (BFU). These were organised in four principle themes:

    a. The publication of recommendations for the use of un-thickened fluids for aircraft with non-powered flight controls;

    b. The publication of requirements for operators of aircraft with non-powered flight controls to establish appropriate procedures for the identification and removal of residues;

    c. The certification/licensing of the providers of de-icing/anti-icing services;

    d. The development and certification of the fluids.

13. With respect to the four principle themes, the Agency had for the purpose of forming a general policy and action plan on this matter developed possible courses of action (options) which were classified in four functional areas and which were also related to the time scales in which they could be realized (short, medium and long-term). In the A-NPA the Agency pre-selected certain options or combinations of options and asked the stakeholders to respond:

    a. Design/Continuing Airworthiness related to design;

    b. Operations;

    c. Maintenance;

    d. Service providers;

    e. Aerodromes.

14. Scope: Before going into the comments and responses for each of these functional areas, it is necessary to mention that there were different views relative to which aircraft were at risk. Some said that the Agency should not limit its actions to aeroplanes with non-powered flight controls but also include hydraulically controlled aeroplanes. Others supported a limitation to aircraft with non-powered flight controls. The Agency agrees with the former view and has considered it in the development of its general policy and action plan for the area.

15. Responses to the functional area Design/ Continuing Airworthiness related to design: The Agency had proposed a combination of options 2 (request TC holders to improve/ provide instructions), 3 (participation in industry working groups to improve standards) and 5 (review of CS-23 and CS-25). The responses to these were varied: regarding option 2 some disputed the need/added value to further improve the instructions, while others believed this to be a good option, while again others believed that this should not be pursued by means of an Airworthiness Directive. Concerning option 3, some stakeholders welcomed the Agency's participation in the relevant standardisation committees, while others seemed to doubt the ability of the industry to self-regulate this problem. Yet others preferred for the Agency to get involved in the certification of fluids. Regarding option 5 some stakeholders disputed the feasibility and viability to review and amend the current CSs, while others believed this to be a good idea and some even requested that any such improved CSs should also be applied to existing in-service aeroplanes (option 6). The Agency treated each comment in turn as can be viewed in section VI, the CRD table of comments and responses, and also developed its own policy and course of action, that can be found in section V.

16. Responses to the functional area Operations: The Agency had proposed option 1 (do nothing) over option 2 (changes to requirements/ guidance material on operations) as the provisions contained in EU-OPS and JAR-OPS 1 are in any case being presently transposed to become implementing rules for the Basic Regulation. Stakeholders tended to be dissatisfied with the chosen option, but did not seem to realise that in the process of the development of implementing rules (IRs) and Acceptable Means of Compliance (AMCs) for air operations they would soon be consulted on the relevant EU OPS transposition, namely OPS 1.345 and 1.346 and associated AMCs. If stakeholders consider all or some elements of option 2 necessary, they are invited to respond accordingly to the forthcoming NPA on Air Operations, which is currently scheduled to be published in Autumn of 2008. Any comments received could then be considered for inclusion in the new implementing rules which may enter into force as early as end of 2009. As far as A-NPA 2007-11 was concerned however, the Agency treated again each comment in turn as can be viewed in section VI and also developed its own policy and course of action that can be found in section V.

17. Responses to the functional area maintenance: There were not very many comments on this area and the option 2 (changes to the requirements and associated material) that was proposed by the Agency was generally welcomed. However the comment was made that the timescale for the proposed changes to the AMC material to Part-M and Part-145 should be clearly defined. Also, it was pointed out that most of the de-icing/ anti-icing activities are carried out by non-maintenance companies to whom for example higher training burden would not apply. The Agency foresees this option in maintenance to be applied in combination with option 2 under Design/Continuing Airworthiness related to Design where the TC holders will be asked to review their materials, which will have to be taken in consideration by operators when developing their "winterisation" programmes. Again the Agency treated each comment in turn as can be viewed in section VI and also developed its own policy and course of action that can be found in section V. Regarding the proposed texts for the relevant AMCs, the resulting texts can be seen on pages 80, 82, 86, 88 and 89.

18. Responses to the functional area Service Providers: The Agency had proposed option 2 (encouragement of industry standards and monitoring programs) as a way forward with respect to service providers that perform de-icing/anti-icing services. However, a majority of the commentators preferred option 3 (regulatory approval of the service providers) that is however at present out of the remit of the Agency's competences. It was felt that option 2, self-regulation, was the status quo as such programs already existed and that only the certification of service providers would make a significant difference. It was interesting that also one service provider demanded to be certified to raise overall quality standards throughout the industry with the aim to prevent deteriorating quality due to price pressures. One commentator suggested option 2 but wanted industry standards and monitoring to apply to both, the fluid and the service providers. Again the Agency treated each comment in turn as can be viewed in section VI and also developed its own policy and course of action that can be found in section V.

19. Responses to the functional area Aerodromes: In its considerations for actions addressed to aerodromes the Agency had in the A-NPA argued for option 2 (finding a mechanism to ensure that a range of de-icing/anti-icing fluids is made available at all appropriate locations) although this option was and still is outside the remit of the Agency and would have to be considered long-term. The commentators, among which there was no aerodrome operator, did mostly support this option but it became also evident that de-icing/anti-icing is very heterogeneously organised and regulated in the Member States. In some Member States the aerodrome operator plays a role in the de-icing/anti-icing ground handling services, while in others the aerodrome is just the host to an unregulated service. Additionally, differences in climatic conditions and environmental regulations and the economic cost resulting from imposing a range of fluid types to be available at aerodromes were being highlighted to the Agency. As always the Agency treated each comment in turn

as can be viewed in section VI and also developed its own policy and course of action that can be found in section V.

20. Information on the situation of the extension of the EASA remit to the safety of aerodromes: Safety regulation of aerodromes is presently outside the remit of the Agency, but the extension of the Basic Regulation is under way: on 25 June 2008 the European Commission adopted and submitted to Parliament and Council the legislative proposal COM(2008) 390[4], which asks for the extension of the Basic Regulation to the safety of aerodromes and ATM/ANS. However, this legislative proposal only envisages that the safety of de-icing/anti-icing services performed at aerodromes is regulated indirectly via the aerodrome operator who is responsible for the safe operation of aircraft on its facility where he is obliged to make suitable arrangements with parties operating there. The Essential Requirements (ERs) being proposed are: B(1)a and B(1)f of the ERs for the safety of aerodromes in annex Va of the said proposal[5]. This situation could change during the legislative process.

21. Responses to the combination of options: As a general rule it can be summarised that those who had criticised certain options are also not happy with the action plan that results from the Agency's combination of options. They mostly wanted a more interventionist regulatory approach. Others found certain options not refined enough given the complexity of the problem. Yet others gave important inputs for consideration when developing certain options further. One National Aviation Authority felt everything concerning service provider and aerodromes was too interventionist, which is due to these services not being under regulation there.

V. Conclusion and summary of policy by which the Agency plans to address de-icing/ anti-icing issues:

22. Conclusion: The review of the comments received to A-NPA 2007-11 indicates that most commentators would wish that the Agency find ways so that:

    a. An appropriate range and stock of thickened and un-thickened fluids to anti-ice aircraft (i.e. each type of fluid should be available) is maintained and offered at each aerodrome receiving commercial air transport aircraft and;

    b. De-ice/ Anti-ice service providers be approved and;

    c. Fluids to de-ice and anti-ice aircraft are certified.

    The Agency concurs that these would be valid courses of action. However for a number of reasons (see below), there are several difficulties to achieve this in the short term, hence these would only be long-term objectives:

    - As the Commission's legislative proposal COM(2008)390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013[6] at the latest. Until that time the Agency has no legal basis to impose on aerodromes to ensure that all services provided at their facilities are safe for

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[4] http://ec.europa.eu/transport/air_portal/traffic_management/ses2/doc/communication/com_2008_0390_1_proposal_regulation_en.pdf.

[5] (a) The aerodrome operator must have, directly or under contracts, all the means necessary to sustain safe operation of aircraft at the aerodrome. These means include, but are not limited to, facilities, personnel, equipment and material, documentation of tasks, responsibilities and procedures, access to relevant data and record-keeping.

(f) The aerodrome operator shall establish arrangements with other relevant organisations to ensure continuing compliance with these essential requirements for aerodromes. These organisations include, but are not limited to, aircraft operators, air navigation service providers, ground handling service providers and other organisations whose activities or products may have an effect on aircraft safety.

[6] It is envisaged that on 1 January 2013 the extension of the Basic Regulation and all its Implementing Rules will be effective.

aircraft operations[7]. In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area.

- The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available within the commercial and geographic environment).
- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative.

23. Summary of short-term policy by which the Agency plans to address de-icing/anti-icing issues: In light of the above conclusion and in order to contribute efficiently and quickly to the present safety concerns, the Agency finds that a practical course of action, that is within the current legal remit, is to require the type certificate holders to provide information and for operators to implement this information in their maintenance programmes according to the following steps:

In accordance with Part 21A.3B (c)[8] as a first step, the Agency would, to obtain appropriate corrective actions, send letters to TC Holders (for EU products) and to NAAs of the State of Design (for non-EU products) informing them of the serious safety concern and requiring each type certificate holder of large aeroplanes (as defined in CS-Definitions) and of commuter aeroplanes (as defined in CS-23) to review and amend as necessary, taking into account published information on fluids re-hydration:

- Their published instructions and procedures for the correct application of de-icing and anti-icing fluids onto their products, and
- Their maintenance instructions for the aircraft upon use of such fluids.

The purpose would be to include or improve instructions as to:

- What to look for (e.g. gel and dried residues),
- Where to look for anti-ice residue in the aircraft structure, and
- How to remove these residues effectively.

Based on experience, the Agency believes that improving instructions relative to these three key points will effectively mitigate the risk posed by the residues.

In addition the maintenance instructions should give guidelines for operators on how to determine the frequency of the necessary checks. Existing published information on fluids'

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[7] Please see the relevant Commission proposal to amend the Basic Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25 June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

[8] **21A.3B Airworthiness directives**
(…)
(c) When an airworthiness directive has to be issued by the Agency to correct the unsafe condition referred to in paragraph (b), or to require the performance of an inspection, the holder of the type-certificate, restricted type-certificate, supplemental type-certificate, major repair design approval, ETSO authorisation or any other relevant approval deemed to have been issued under this Regulation, shall:

1. Propose the appropriate corrective action or required inspections, or both, and submit details of these proposals to the Agency for approval. (…)

re-hydration could be usefully taken into account when defining the M.A.302 maintenance programme. It is foreseen that the Agency will require that the review and necessary amendments should be available to operators prior to the 2008 winter operation for aeroplanes that are most susceptible to the phenomenon (usually those equipped with one or more non-powered flight controls) and prior to 2009 winter operations for the others. If TC holders consider their aeroplanes as being less sensitive or not affected, this should be justified.

When these instructions have been defined by TC holders, European operators would have to incorporate them into their maintenance programme in accordance with Part-MA.302 (f) and (g) and into their Operations Manual in accordance with EU-OPS Subpart P. To further support these actions the Agency will issue an NPA to suggest changes to Part-M in order to better address the consequences of de-icing and anti-icing fluids on continuing airworthiness.

In parallel the Agency would update the Safety Information Notice SIN 2008-29 on De-icing/Anti-Icing[9] in order to inform aircraft operators of this course of action and recommend the operators to update their maintenance instructions and develop de-icing/ anti-icing residue removal programmes with the information that will be provided to them.

As a second step and if the Agency considers the manufacturers have not provided the said information it intends to issue Airworthiness Directives (ADs), in accordance with Part 21A.3B, covering specific aircraft types, which will incorporate mitigating actions. Furthermore, because Part-M requires the maintenance programme to be revised only at least once a year as a minimum, the Agency may consider AD issuance before the end of 2008, requiring update of the maintenance programmes within 30 days, for aircraft on which an unsafe condition has been identified to exist.

Lastly, as a third step, the Agency will inform the accident investigation bodies (AIBs) from whom the safety recommendations originated, what the Agency has done in relation to these recommendations and highlight which aspects of the recommendations were in its current remit and which ones lay outside.

24. Summary of medium and long term policy by which the Agency plans to address de-icing/ anti-icing issues:

In accordance with the core feedback from respondents, the Agency is also envisaging other medium and long-term actions in coordination with FAA and TCCA as appropriate:

- Continue to take note of activities and progress made by the relevant SAE Committee and sub-groups on this subject and provide input as necessary (long-term).
- Make proposals to the European Commission for studies to evaluate the feasibility of introducing in CS-23 and CS-25 a criterion for establishing sensitivity to fluid residues (long-term).
- Investigate and recommend the means by which Aviation Authorities of Member States manage matters in regard to the certification of service providers, availability of fluids at aerodromes, etc (mid-term).
- Make, as far as possible, provisions in the implementing rules on the safety of aerodromes with a view to make the operations of de-ice/anti-icing service providers safer and ensure the availability of fluids (mid-term).
- Consider input from stakeholders regarding amendments to the operational rules on de-icing/anti-icing, during the impending NPA consultation process of the implementing rules for air operations to the Basic Regulation (medium-term).

[9] http://www.easa.europa.eu/ws_prod/c/doc/Safety_Info_Reports/SIN%202008-29%20De-Anti-Icing.pdf

- Plan to introduce into the rulemaking inventory a task to extent the Agency's remit to fluids and materials in addition to parts and appliances. Such a task would be preceded by an A-NPA to explain and consult on the concept (long-term).

The Agency believes that the above policy elements, when aggressively pursued, provide a good basis for improving the situation regarding the problem of residue formation caused by de-icing/anti-icing fluids. Stakeholders may respond to this CRD as described under Section III.

VI. CRD table of comments, responses and resulting text

(General Comments)	-

comment	*8* comment by: *Airline Services* First and foremost – why does the document need to be presented in such a fashion, using so many words, to the point that it needs to be read several times in order to understand the meaning? I accept that it will be read by those whose first language may not be English. My first language is English, and I found it difficult to comprehend! For those who have English as a second language, I would suggest that they will have considerable difficulty with it. Many people have had, and continue to have, meetings with regard to the specific subjects raised in this document. For some years, via the JAA Working Group (now disbanded) and more recently via the CAA (U.K.) Working Group, I (together with many others) have asked that these people be brought together or at least have a common reporting base. In Europe, EASA now seems to be the logical centre point.
response	*Accepted* We accept that the structure of the document was not optimal. Unfortunately, the many subject areas that this matter crosses, the comprehensive approach taken by the Agency and the formalised procedural requirements for this type of document resulted in a complex document. The EASA thanks all contributors but also notes regrettably that contrary to its expectations, very few service providers and airports chose to respond to this A-NPA. This may not be a problem in itself because the competencies towards these stakeholders will only move into the EASA remit in two to three years from now. In addition service providers can in accordance with the Commission proposal (COM) 390 only be addressed indirectly either via aerodrome operators or aircraft operators.

comment	*11* comment by: *Airline Services* With reference to making training orientated towards aircraft type – I consider this to be a definite NO. My reason for saying so is as follows. For an airline operating, say, 3, 4 or maybe even 5 types of aircraft then type specific training would not be a problem. For a service provider de-icing in excess of 100 different types of aircraft, perhaps for 120 different operators – all with differing interpretations of the same requirement – this would be a problem of **major proportions**. A standard training programme for each aspect of de-icing is essential, with anything type specific being covered in a training section entitled Type Specific.
response	*Noted*

comment	*12* comment by: *Airline Services* With reference to aerodromes – My company currently de-ices at 10 different airports. None of these have dictated or even suggested the fluids that we supply. Just so long as we comply with current health & safety and spillage regulations, then we are acceptable to them.
response	*Noted* This anecdotal yet interesting comment is noted but it would need to be concurred if this is also the case for non-UK providers.

comment	*34* comment by: *Aircraft Engineers International (AEI)* Comment: AEI proposes that EASA creates a new WG with a TOR that covers not only De- & Anti-icing, Cleaning, and Re-fuelling activities, but all activities that are presently carried out on aircraft by non Part 145 AMO personnel that can have an influence on flight safety. Reason: To look at the possibility to set training, experience, exam, and competence standards for this category of personnel, since the quality of such work/activities clearly can have a negative influence on the airworthiness of aircraft, and with that aviation safety. This would definitely come under the EASA area of responsibility, since EASA is an Aviation Safety Agency, and it now is progressing from an Agency that covers not only maintenance, but also Operations, and soon more aviation areas
response	*Noted* This comment will be passed to the SSCC maintenance committee. The Agency will take the comment into consideration when implementing the actions of the Action Plan that is found in the main body of the CRD.

comment	*38* comment by: *Association of Dutch Aviation Technicians* This NPA is a good solution in the prevention of potential safety hazards associated with the residues of fluids used for the de-icing and anti-icing of aircraft, a proper implementation of this NPA will enhanced the flight safety level.
response	*Noted*

comment	*46* comment by: *European Regions Airline Association* ERA has consistently raised the profile of safety issues concerning 'winter operations' and the urgent need for regulatory action concerning the potential adverse effects of de-/anti-icing fluid residues on aircraft, particularly those with un-powered flight controls. Whilst I am gratified that these issues have been recognised and accepted as important to the EC and to EASA's work programme, having reviewed the

	Advance Notice of Proposed Amendment (A-NPA) No 2007-11 that seeks to identify a possible course of action for EASA to address the issue of de-/anti-icing fluid residue, I have grave concern that the document fails to adequately address a number of the key issues spelt out within the A-NPA itself. The UK AAIB recommended that EASA *'considered the future need for the training and licensing of companies who provide a de/anti-icing service, so that anti-icing fluids are applied in an appropriate manner on all aircraft types'*. Similarly the German BFU commented that, in order to maintain the airworthiness of aircraft, aircraft de-icing *'should be accomplished by certified and approved companies under the supervision of civil aviation authorities'.* The BFU go on to say that *'If aircraft de-icing is not accomplished by an operator or an approved maintenance organisation the ground service 'aircraft de-icing' should be subject to appropriate aeronautical regulation'.* However, in spite of the above, the Agency has, at this stage at least, opted to stop short of regulating the de-/anti-icing service providers and has instead recommended the *'development of industry standards and industry monitoring programme'* in the hope that it *'may bring an appropriate increase in safety'.* There can only be one 'best way' to de-ice or anti-ice a particular aircraft type, yet the current situation, whilst placing on operators the burden of ensuring a 'clean wing on rotation', allows individual ground icing agencies outside their control to undertake their activities with no regulatory supervision and with no obligation for consistency in practice or technique. With regard to ensuring that the required types of fluid are available at all necessary locations, I am pleased that the A-NPA suggests that *'Some mechanism is required to ensure that the range of de-icing and anti-icing fluids is made available at all appropriate locations.'* I look forward to seeing this followed through expeditiously. Finally, it remains important and urgent that further research is mandated to develop the range of available fluids to increase their performance, hold-over times and to minimize or eradicate residues and to mitigate corrosion on vital aircraft components. Whilst we are aware that a full NPA does not automatically follow an A-NPA, our operators expect regulatory action to be undertaken on these issues before an aircraft and lives are lost. We cannot accept that such action is delayed any further. Europe experienced one mild winter last year but this was an exception. I will ensure that ERA supports your efforts on these issues to the maximum of our resources.
response	*Partially accepted* The Agency wants to take appropriate action on the recommendations of the accident investigation boards. Certain limitations exists at this point, these are: • As Commission proposal 390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013(*) at the latest. Until that time the Agency has no legal remit to impose on aerodromes to ensure that all services provided at their facilities are safe for aircraft operations(**). In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area. • The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available

within the commercial and geographic environment).

- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative..

Despite these limitations the Agency is planning to pursue the action plan as outlined in the explanatory memorandum of the CRD and in the short term act upon Type certificate holders to consistently provide the necessary information for operators to manage the residue problem.

(*) It is envisaged that on 1.1.2013 the extension of the Basic Regulation and all its Implementing Rules will be effective.

(**) Please see the relevant Commission proposal to amend the Basic Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25 June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

comment

62 comment by: *Association of Dutch Aviation Technicians*

It is perfectly clear that by implementation of this NPA, the accomplishment and inspection of the de-ice anti-ice treatment is the responsibility of the person who will sign for the Pre-flight inspection.

response

Noted

Current Regulation (EC) No 08/2008: According to appendix 1 to OPS 1.1045 and in particular §8.2.4, the Operation Manual from the operator shall describe the operating procedures relative to de-icing and anti-icing activities on the ground. These activities are therefore under the quality system's operator.

According to Regulation (EC) No 2042/2003 (M.A.201 (d)), the pilot-in-command or, in the case of commercial air transport, the operator shall be responsible for the satisfactory accomplishment of the pre-flight inspection. This inspection must be carried out by the pilot or another qualified person but need not be carried out by an approved maintenance organisation or by Part-66 certifying staff.

comment

67 comment by: *FRAPORT AG*

FRAPORT AG supports the effort of EASA to take over competence for the rulemaking in this area.

FRAPORT AG underlines the activities to address the various parties involved. From the airport owner/operator point of view it is evident to take care of the final responsibility of the infrastructure provider. The airport owner/operator is the entity providing the necessary land and facilities and as well to take care of any environmental effect.

EASA is requested to consult airport owner/operator and service providers in the future rulemaking process to assure that the appropriate parties involved are clearly addressed.

response

Accepted

The Agency thanks Fraport for responding to this A-NPA. However, more detailed comments to the subsections of the A-NPA, and an alert message to ACI about the existence of this A-NPA, would have been more than welcome. As it stands the result for airports is not representative. It would be useful if ACI were to organise a focal point regarding this issue who will undertake to keep relevant ACI sub-groups informed.

comment

89 comment by: *Bombardier*

We at Bombardier feel this NPA is heavily biased against un-powered flight control equipped aircraft designs. Whereas there is only one reference to aircraft with powered control systems (*AAIB Safety Recommendation 2005-137*), there are thirteen to un-powered controls.

There have been a number of reports of anti-icing fluid residues affecting the powered aileron flight control system of one type of regional jet aircraft. Maintenance actions, that include frequent inspection for accumulations of fluid residues and their removal, have been taken to rectify the situation.

There have been more reported cases of residue issues on aircraft with un-powered controls (mostly on one type); nevertheless the residue problem also exists for powered control system equipped aircraft. The NPA may inadvertently give the impression that aircraft equipped with powered controls are immune to the residue problem.

response

Accepted

The Agency agrees that fluid residue also poses a risk for aircraft with powered flight controls and will take this into consideration.

comment

91 comment by: *Bombardier*

Attachment #1

On behalf of Bombardier Aerospace, Inc., please find attached our comments regarding NPA 2007-11.

Should you have any questions, do not hesitate to contact the undersigned.

Regards,

Tiffany Gibson
Rulemaking Coordinator.
Airworthiness Department
Bombardier Aerospace

response

Noted

comment

109 comment by: *UK CAA*

The problem of control restrictions caused by anti-icing fluid residues has not arisen in the USA or Canada, in spite of the high number of regional flights and longer winters in their more northerly states. BAE146 aircraft returning from

	the USA have been found to be totally free of fluid residue build up. Has EASA investigated the causes for the difference? The two likely options are: different brands of fluid and different practices in applying the fluids. In the USA, aircraft are deiced with deicing fluid and then, if necessary, a thin coating of anti-icing fluid is applied. Here in Europe it seems to be common practice to deice with anti-icing fluid, which will involve both more frequent and more thorough applications of thickened fluid than is necessary, thus unnecessarily increasing exposure to the risk of control restrictions.
response	*Accepted* The Agency agrees and believes also that the two-step de-icing process used in the USA and Canada leads to these countries having less of a problem with ant-icing fluids residues because the de-icing with type I fluids washes off the anti-icing fluids so that residue is less likely to accumulate over time and thus less re-hydration of such fluids takes place. In 2006 an investigation report by the German BFU (document 5X007-0/05 of November 2006) argued that the dominant use of anti-icing fluids (SAE types II to IV) as opposed to type I is to do with organisation of the market for aircraft de-icing, where un-sound trends were being observed. *"The Increase of control problems after de-icing of aircraft with non-powered controls has its origin in the fact that the de-icing with un-thickened de-icing fluids (type 1) has decreased due to the ever reduced supply. Only one in three stations has type I in stock."* This in turn, so the argument, had come about by the service providers wish for a "one-type fits all" de-icing fluids and the demand of operators for longer hold-over times. Requests by operators with non-powered controls were warded off by cost arguments. The EASA Safety Information Notice (SIN 2008-29) on page 8 recommends a two step process: first de-icing of contaminants and if freezing conditions exist or are expected a anti-icing treatment.

TITLE PAGE p. 1

comment	*70* comment by: *Cessna Aircraft Company*
response	*Noted* Noted

comment	*71* comment by: *Cessna Aircraft Company* Cessna Aircraft Company-- In reply refer to E390-07-3549 It is well known that ground de-icing/anti-icing fluids were developed and implemented to provide protection from frozen contaminates so that a safe takeoff could be achieved. The residues left behind should be benign in all environmental conditions. These fluids should provide safety, not create incidents. Cessna supports the position that fluid residues should be reduced through revision of the SAE standards or regulatory standards. In the interim, cleaning and inspection are the only practical solutions to reduce the effects of fluid residues.
response	*Partially accepted*

Cessna is right to place emphasis on inspections of aircraft and removal of residues for the short-term and the change of the SAE specifications in the long-term. The Agency will work towards the achievement of both approaches. But while former places a lot of burden on the operators and almost none on the other actors, progress on the latter has been very slow. Therefore, the Agency would also aim to work towards the greater availability of the type I fluid at the stations. Here, the cooperation of the National Aviation Authorities would be needed, because the Agency has no jurisdiction over aerodromes and service providers thereon.

comment

110 comment by: *UK CAA*

The control restrictions are caused by the residue left behind from thickened anti-icing fluids (types II, III, IV) , not un-thickened deicing fluids (type I).

response

Noted

A. EXPLANATORY NOTE - IV. A-NPA Background p. 4

comment

125 comment by: *UK CAA*

The theme throughout Section IV Background of the A-NPA is that it is aircraft with non-powered control systems that are particularly at risk of frozen flight control systems. This is no doubt true statistically, but there is also evidence that aircraft with powered control systems are also at risk, if the restriction affects the control runs. Presentations at the recent SAE 2007 Icing Conference gave several examples of problems on these aircraft where fluid residues penetrated to the control runs, as well as accumulating inside control surfaces. More emphasis needs to be applied in the proposals to aircraft with powered controls.

Justification:
Self explanatory.

response

Accepted

The Agency agrees that fluid residue also poses a risk for aircraft with powered flight controls and will take this into consideration.

A. EXPLANATORY NOTE - IV. A-NPA Background - 8. Description of the problem p. 4

comment

19 comment by: *Flybe*

Page 4 para 8.1

The problem caused by the presence of residues re-hydrating and then freezing, can/will affect any aircraft with a mechanical flight control input system between the flight deck and the control. The majority of problems to date have been caused by obstructions in the input system preventing it transmitting a command to the flight control, be it a servo tab or a PCU. The effect will be the same. Non Operation of the Control. This reference to non-

	powered flying controls implies that only aircraft with this type of system can be affected, which is misleading. This implication is in its self a Flight Safety issue. The theme is carried all the way through the NPA.
response	*Accepted* The Agency agrees that fluid residue also poses a risk for aircraft with powered flight controls and will take this into consideration.

comment	*27* comment by: *SNMSAC Syndicat National des Mécaniciens Sol de l'Aviation Civile* On this subject, we have two comments to make: one on the technical plan, the other in the ecology field/safety. 1) In addition to the flight control, the product returns regularly in the system of conditioning through the packs. That causes fume or at least odours in cabin. Also, the APU absorb some regularly. 2) Beyond the technical problem, there is the shutter ecology, with the recovery of worn products, storage and recycling. In addition, the safety field is to be taken into account. On the small platforms, deprived of surface of de-icing, the planes are treated on the tarmac. Spread on the ground, occurs is seldom recovered. Once that one walked inside, that becomes very slipping: as well for the personnel (ramp agent, technicians.) as for the passengers which goes to the plane. The worst, it is when this product is deposited in the staircases of the plane.
response	*Noted* 1) Technical part of the comment: The consequences for the commercial and flight operations are clearly understood. An A-NPA about the air cabin quality is under progress and the comment is passed on to the persons managing this future document. 2) The term "shutter ecology" is not understood. It is suggested the comment to be clarified and filed again if more appropriate in NPA 2008-15 (Essential requirements for Civil Aviation Environmental protection). 3) Additional part of the comment (safety at work): this aspect is out of the remit of the Agency and is generally regulated by the national rules.

comment	*36* comment by: *D-ICE* Attachment #2 Dear Sirs, Following the presentation of EASA A-NPA 2007-11 by Eric Duvier, EASA Certification Directorate, at the SAE Aircraft & Engine Icing Conference in Seville we hereby take pleasure in following up by commenting on the A-NPA. Our perspective on the issue of thickened fluid residues and frozen controls is

based on several years of R&D work, field testing and regulatory consultation concerning new technology to support pilot's de-/anti-icing decisions. Our company, D-ICE A/S has been an active member of the SAE G-12 Committee and subcommittees for the past 3 years. And we have cooperated with Transport Canada throughout the past 3 years on the regulatory aspects of using technology as opposed to Holdover Time tables.

Technology approach to improved de-icing decisions

In March 2007 Transport Canada issued an Exemption from CAR 622.11 allowing a Canadian Air Operator to use Holdover Time Determination Systems as part of their Ground De-icing Program and in lieu of using HOT tables. In the assessment for initiating the Exemption process, both public interest and aviation safety was cited:

a) Public interest in terms of a potential for *reduction in the use of anti-icing fluid* (economical and environmental impact)

b) *Enhanced flight safety* by virtue of providing a more precise holdover time as well as generating of holdover time guidance information that currently is not available in the HOT tables.

A Holdover Time Determination System consist of a range of meteorological and precipitation collection sensors used to measure critical weather parameters more accurately than current methods and information contained in METAR allow for. The sensor inputs are combined in a software program which through regression analysis computes an accurate holdover time as a single value and outputs a report to the Pilot In Command (PIC) on request.

As part of the Exemption Documentation process Transport Canada also developed a set of Minimum Performance Requirements for Holdover Time Determination Systems. FAA is currently looking at possibilities for using the same type of approach.

Relevance to A-NPA 2007-11

Reduction of the use of anti-icing/thickened fluid is particularly relevant to the A-NPA 2007-11 and the actions undertaken to minimize the risk of frozen controls. On page 4, section 8.2.i is stated that a possible action include "the means to ensure the most appropriate fluid is available at the point of use".

In addition to this we see it as equally important to make sure that the most appropriate fluid is in fact also selected by the PIC relative to the prevailing weather conditions at the time of departure.

Substantiated background information:

As explanation, please allow us to quote a research study that APS Aviation Inc. (an internationally recognised aircraft de-icing consultancy company performing e.g. all endurance time testing of de-/anti-icing fluids under contract to Transport Canada and FAA) carried out on behalf of D-ICE A/S at Dorval Airport in Montreal in the winter seasons 2004/05 and 2005/06.

Almost 1500 flights departing in active winter precipitation conditions were monitored on site by a trained observer. The overall results that came out of the study were consistent over the two seasons:

- 61% of all flights passing through the Central Deicing Facility in active precipitation conditions made a good selection of de-/anti-icing process under the given weather conditions, actual time on the ground after start of the last application etc.

- 27% of all flights passing through the Central Deicing Facility in active precipitation conditions chose a type IV anti-icing spray where a type I de-icing would have been sufficient

- 8% of all flights passing through the CDF in active precipitation conditions did not deice (dry blowing snow may not adhere, so a decision not to deice in active precipitation may be appropriate – however the actual measured weather conditions during some of the events indicate a risk of precipitation adhering during taxiing)

- 4% of all flight passing through the CDF in active precipitation conditions took off with exceeded Holdover Time (this number is based on using regression based HOT calculation – if the current tables had been used the number would have been higher)

The above figures are attributed to the fact that the format of the current HOT tables significantly limits the amount of information that a PIC can access while at the same time there is also a disconnect between the information that current HOT tables build upon and the tools available to PIC's to interpret weather and make optimal de-icing decisions on.

Residue effects / flight safety:

The prevailing de-icing scenario in Europe is using type II for both de- and anti-icing. The fluid is mixed with water in 50/50, 75/25 blending or used neat 100/0 so transferring the PIC decision scenario from Montreal to a European scenario will actually have pilots selecting a 75/25 or 100/0 mix in many cases where either 50/50 or 75/25 respectively could have done the job safely. In the cases where type I / type IV is available for de-icing at an airport a significant number of type IV sprays could be avoided.

Spraying aircrafts with less thickened fluid and more hot water is reflected in a lower risk for building up residues in the aerodynamic quiet areas – not forgetting the economical and environmental aspects in an airport. As an added flight safety benefit of using Holdover Time Determination System we must point also to the potential reduction in the number of departures with exceeded holdover times.

Suggested amendment of A-NPA 2007-11

In conclusion we would like to encourage EASA to also include means to help PIC's optimise the selection of de-/anti-icing fluids by examining the potential use of Holdover Time Determination Systems at European Airports, as a possible course of action in the A-NPA 2007-11.

Assuming that the suggested amendment will require development of performance requirements within EASA we also encourage EASA to include the Performance Requirements developed by Transport Canada either in full or as a harmonised standard in the A-NPA 2007-11.

We do realise that EASA will need to have a more detailed insight into the background of the Exemption work and in particular the research and basis that the process was founded on, and we will support EASA to the full extent of our capabilities

On a final note we would like to also highlight that we are in discussion with a European Airport on establishing a pilot project with Holdover Time Determination Systems. If EASA could see any opportunity to participate in the regulatory discussions we would welcome that very much in view of our experiences in working with Transport Canada on the subject.

Kind regards

D-ICE A/S
Peter Graversen
CEO

response *Noted*

The Agency welcomes the initiative to have this new technology presented and also appreciates for De-ice to have shared the research results. However, the suggested technology as far as Europe is concerned has not undergone a regulatory assessment.

The Agency is open to discussions on the use of the technology, but as the aerodromes are currently outside our remit the Agency would refrain from making specific technological recommendations to aerodromes. Therefore, the Agency does not see the need to extent the scope of the A-NPA to include this technology. Furthermore, determination of hold-over time remains the operator's responsibility.

comment *63* comment by: *Thomas Helman*

Not familiar with this as being a problem in the USA.

response *Noted*

comment *64* comment by: *Thomas Helman*

I think the best course of action would be to encourage the development of fluids that do not contain agents that form re-hydratable residues or additives to prevent it.

response *Noted*

Unlike the un-thickened de-icing fluid SAE type I, the fluids of type II, III and IV have a small portion of a polymer added to adjust their viscose-elastic properties to the requirements for prolonged re-de-icing. As long as the aircraft stands still or moves slowly the thickener ensures that enough fluid remains on the aircraft and prevents its re-icing during a given time period. There are therefore properties of the agent which are currently to some extent desired and it would need to be investigated if these can be replaced or reduced so that the negative effect of residue formation can be reduced to the largest possible extent. The Agency welcomes more information regarding research results into the replacement of these thickeners with equally environmentally sustainable solutions.

A. EXPLANATORY NOTE - IV. A-NPA Background - 9. Recommendations from accident investigators p. 4-6

comment	*39* comment by: *Juha Fieandt* The recommendation should not only focus on non-powered flight control airplanes as the problem is evident for hydraulically controlled airplane types as well
response	*Accepted* The Agency agrees that fluid residue also poses a risk for aircraft with powered flight controls and will take this into consideration.

comment	*40* comment by: *Juha Fieandt* The certification and/or licensing of service providers is one very important step towards a standard of safe and proper de-icing service. This should be taken into the EASA program immediately when moving over from JAR-OPS to EASA-OPS
response	*Partially accepted* The Agency wants to take appropriate action on the recommendations of the accident investigation boards. Certain limitations exists at this point, these are: • As Commission proposal 390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013(*) at the latest. Until that time the Agency has no legal remit to impose on aerodromes to ensure that all services provided at their facilities are safe for aircraft operations(**). In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area. • The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available within the commercial and geographic environment). • Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency. • The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative. Despite these limitations the Agency is planning to pursue the action plan as outlined in the explanatory memorandum of the CRD and in the short term act upon Type certificate holders to consistently provide the necessary information for operators to manage the residue problem. (*) It is envisaged that on 1.1.2013 the extension of the Basic Regulation and all its Implementing Rules will be effective. (**) Please see the relevant Commission proposal to amend the Basic

Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25th June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

comment

49 comment by: *European Regions Airline Association*

The UK AAIB recommended that EASA *'considered the future need for the training and licensing of companies who provide a de/anti-icing service, so that anti-icing fluids are applied in an appropriate manner on all aircraft types'*.

Similarly the German BFU commented that, in order to maintain the airworthiness of aircraft, aircraft de-icing *'should be accomplished by certified and approved companies under the supervision of civil aviation authorities'.* The BFU go on to say that *'If aircraft de-icing is not accomplished by an operator or an approved maintenance organisation the ground service 'aircraft de-icing' should be subject to appropriate aeronautical regulation'.*

However, in spite of the above, the Agency has, at this stage at least, opted to stop short of regulating the de-/anti-icing service providers and has instead recommended the *'development of industry standards and industry monitoring programme'* in the hope that it *'may bring an appropriate increase in safety'*

Can the Agency advise quite why it has stopped short of the regulatory action as proposed by the above mentioned Accident Investigation Boards, together with its proposed actions to comply with these recommendations.

response

Partially accepted

The Agency wants to take appropriate action on the recommendations of the accident investigation boards. Certain limitations exists at this point, these are:

- As Commission proposal 390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013(*) at the latest. Until that time the Agency has no legal remit to impose on aerodromes to ensure that all services provided at their facilities are safe for aircraft operations(**). In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area.
- The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available within the commercial and geographic environment).
- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative.

Despite these limitations the Agency is planning to pursue the action plan as outlined in the explanatory memorandum of the CRD and in the short term act upon Type certificate holders to consistently provide the necessary information for operators to manage the residue problem.

(*) It is envisaged that on 1.1.2013 the extension of the Basic Regulation and all its Implementing Rules will be effective.

(**) Please see the relevant Commission proposal to amend the Basic Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25th June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

comment *60* comment by: *AEA*

AEA Comment 3

AFFECTED PARAGRAPH

IV. A-NPA Background. 9. Recommendations from accident investigators

Para.9.1

COMMENT

Would agree that Type I fluid does need to be made available at cold weather Stations served by aircraft with un-powered flying controls. However, while Type I fluid is ideal for removing frozen contaminants, it provides virtually no anti-icing protection. For this reason Type II, III or IV fluid would also need to be available/used on these aircraft, when the holdover time provided by the Type I fluid was insufficient to allow a safe take-off.

response *Accepted*

The Agency agrees with this comment and wants to point out that the aim is not to ban SAE fluid type II, III and IV, and to replace them with type I, but that type I should be made available at most stations and for all aircraft that require and all operators that desire it. Meanwhile the residue forming property of the thickened fluids should be reduced and the persisting problems with residues must be properly managed by the operator with the help of more information to be given to the operators by the type certificate holders.

comment *65* comment by: *Thomas Helman*

I do agree that licensing or certificating of contracting companies for de/anti-icing services should be required as are repair stations.

response *Partially accepted*

The Agency wants to take appropriate action on the recommendations of the accident investigation boards. Certain limitations exists at this point, these are:

- As Commission proposal 390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013(*) at the latest. Until that time the Agency has no legal remit to impose on aerodromes to ensure that all services provided at their facilities are safe for aircraft operations(**). In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area.
- The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available within the commercial and geographic environment).

- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative.

Despite these limitations the Agency is planning to pursue the action plan as outlined in the explanatory memorandum of the CRD and in the short term act upon Type certificate holders to consistently provide the necessary information for operators to manage the residue problem.

(*) It is envisaged that on 1.1.2013 the extension of the Basic Regulation and all its Implementing Rules will be effective.

(**) Please see the relevant Commission proposal to amend the Basic Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25th June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

comment

66 comment by: *Thomas Helman*

I do feel that in the meantime manufactures should come up with inspection criteria to locate the areas of the aircraft susceptible to residue build-up.

response

Accepted

The Agency acknowledges and agrees with the commenter proposal that manufactures should come up with inspection criteria to locate the areas of the aircraft susceptible to residue build-up. The inspection program shall be aircraft specific.

comment

68 comment by: *Transport Canada Civil Aviation Standards Branch*

Although the A-NPA refers (in paragraph 9.4 and 11.1 Option 5) to certification requirements relating to the use of de-icing/anti-icing fluids, this is in the context of the problem of hazards associated with residue fluid causing flight control problems.

There also have been a number of problems on different aircraft types due to an adverse effect on aircraft takeoff performance and handling characteristics due to incomplete fluid flow off from the wing and tail at rotation. This currently is not addressed in the certification requirements and it is recommended that this aspect be included in the development of the NPA.

response

Noted

The Agency acknowledges the commenter reference to fluid flow-off issues. However, the objective of this NPA is restricted to identifying means of action to mitigate concerns of re-hydrated gels of thickened ground anti-icing fluids.

The Agency considers at this time that there are courses of action independent of the flow-off characteristics and the Agency is intent to pursue this as the most promising approach until efforts demonstrate otherwise.

A. EXPLANATORY NOTE - IV. A-NPA Background - 10. Presentation of related activities p. 6-7

comment	*9* comment by: *Airline Services* It seems that the FAA is proceeding towards a standardised guidance on the subject. Surely this is what EASA should also be leading towards? Several times in the past I have been advised that EASA do not have the authority to regulate on such matters; and that, to change the law would take many years. However, EASA can dictate to the individual NAAs to control ground de-icing in such a way as to minimise the difficulties to which this document refers (and many discussion groups have spoken about for some time). As eloquently put by one of the U.K. AAIB members at a meeting in Basle – "we have been talking about this for 9 years, but still no firm action". I recall that the rest of his comment was short and to the point, whereby he sat down. That was 3 years ago. Not a great deal has changed since then, other than a huge maintenance burden on the operators in overcoming a difficulty with a developed de-icing fluid that suits 1 group of operators, but gives another group operational difficulties.
response	*Not accepted* The Agency does not agree with this comment because it cannot dictate to the NAA how to deal with this problem. The Agency could only consider making de-icing a maintenance activity which would have a number of consequences. The Agency wants to advise stakeholders to lobby also their own NAAs to review their approach to the regulation of de-/anti-icing in the light of the new evidence and developments. The Agency wants to take appropriate action on the recommendations of the accident investigation boards. Certain limitations exists at this point, these are: • As Commission proposal 390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013(*) at the latest. Until that time the Agency has no legal remit to impose on aerodromes to ensure that all services provided at their facilities are safe for aircraft operations(**). In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area. • The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available within the commercial and geographic environment). • Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency. • The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative. Despite these limitations the Agency is planning to pursue the action plan as outlined in the explanatory memorandum of the CRD and in the short term act upon Type certificate holders to consistently provide the necessary information for operators to manage the residue problem.

(*) It is envisaged that on 1.1.2013 the extension of the Basic Regulation and all its Implementing Rules will be effective.

(**) Please see the relevant Commission proposal to amend the Basic Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25th June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

comment

20 comment by: *Flybe*

Page 6 para 10

I was of the impression that the JAA De/Anti-ice Steering Group had been closed

I suspect that the AEA and ERA only have access to information from some of their members.

response

Noted

comment

41 comment by: *Juha Fieandt*

It must be noted that AEA already has a Training Manual available and that FAA work is not the only organisation working on this. EASA should also focus on this training issue and start preparation for required minimums in training.

response

Partially accepted

The Agency can only partially agree to this comment. Indeed training of the de-icing service providers is very important but under the current rules it is the responsibility of the aircraft operator to ensure that they do not commence operations without being properly de-anti-iced. Since many of the operators chose to cease doing these activities themselves, they need to ensure that the ground handlers are doing the de-icing adequately. On the other hand the Agency understands the desire of some service providers to have a minimum standard of service and training requirements being set by a regulator in order to prevent quality from being diminished due to competition on price.

comment

50 comment by: *European Regions Airline Association*

This paragraph states "It furthermore took into account stakeholders' concerns raised at the ERA Winter Operations Workshop held in Basel, Switzerland, in April 2006."
It has always been ERA's position that the way forward in this respect is by regulation of the de/anti-icing service providers and urgent research mandated to develop the range of available fluids to increase their performance, hold-over times and to minimize or eradicate residues and to mitigate corrosion on vital aircraft components.

Can the Agency advise exactly how ERA's views were taken into account and advise the reasons why they appear to have been dismissed in this A-NPA.

response

Partially accepted

The Agency wants to take appropriate action on the recommendations of the accident investigation boards. Certain limitations exists at this point, these are:

- As Commission proposal 390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013(*) at the latest. Until that time the Agency has no legal remit to impose on aerodromes to ensure that all services provided at their facilities are safe for aircraft operations(**). In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area.
- The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available within the commercial and geographic environment).
- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative.

Despite these limitations the Agency is planning to pursue the action plan as outlined in the explanatory memorandum of the CRD and in the short term act upon Type certificate holders to consistently provide the necessary information for operators to manage the residue problem.

(*) It is envisaged that on 1.1.2013 the extension of the Basic Regulation and all its Implementing Rules will be effective.

(**) Please see the relevant Commission proposal to amend the Basic Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25th June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 11. Design/Continued Airworthiness related to design p. 7-8

comment	*1* comment by: *Chair of Residue Workgroup, SAE* On Option 3: ISO 11076 should be ISO 11078. Are ISO 11075 and AMS 1424 relevant, as they only cover fluids that do not cause residues? For step (b), it will not be possible to report the residue characteristics in the material standards. This would mean re-issueing a standard at least annually which is impractible and costly to the purchasers of the standard. An alternative method should be possible, but will be dependent on the fluid manufacturer's all agreeing to publish the data, as they legally own it. For step (c), it is suggesting different fluid application methods for fluids with different residue characteristics. The application method should be the same for any fluid that has the potential to cause residues, and is already determined by the safety aspect of the prevention of ice. It may be possible, however, to use the different residue characteristics to affect the inspection and cleaning frequencies. EASA are recommending that they participate in the forums and working groups. To participate in the SAE, they would need to travel to the various meetings, so that they can hear and discuss the range of views and issues. This hasn't happened so far, although the SAE Residue Workgroup welcomes the impact that they have had.
response	*Accepted* 1. The Agency agrees with the commenter as to the editorial mistake in Option 3: ISO 11076 should be corrected to ISO 11078. 2. The Agency agrees with the commenter that ISO 11075 and SAE AMS 1424 are not primarily relevant to the issue. However it should be noted that these specifications do not restrict composition. Therefore, some kind of residue assessment method will also have to be discussed for Type I fluids. 3. The intent of the comment related to Option 3(b) is agreed: material standards (AMS, ISO) are independent of the fluid vendor, and there are publishing constraints that would not allow changing that aspect. The Agency in its A-NPA text however did not refer to the actual fluid values but to the introduction of a requirement of residue data reporting. The residue data would thus at least appear in the qualifying laboratory report as other properties being measured per the standard; more visible publication such as in a yearly listing is discussed by other commentator. 4. The intent of the comment related to Option 3(c) is agreed with: application method are so far independent of the fluid vendor, and compromising such a fundamental operational requirement would probably severely impact feasibility. The Agency in its A-NPA however alluded to promote selection of existing ARP application procedures based on residue data. For example high residue fluid would not be allowed without a two step procedure involving a non-residue forming fluid application in step 1.

comment	*2* comment by: *Chair of Residue Workgroup, SAE* Option 4: ISO 11076 should be ISO 11078
response	*Accepted* EASA agrees with the commenter as to the editorial mistake in Option 4: ISO 11076 should be corrected to ISO 11078.

comment	*13* comment by: *Francis Fagegaltier Services* Explanatory note, § 11.1, option 2 : "may take the form of an airworthiness directive" (1) There are, in EU texts, some rules and guidance material related to issuance of ADs. 21A.3B defines the cases where an AD may be issued. AMC 21A.3B(b) defines the "unsafe conditions". Is the action (issuance of ADs) which is proposed in this option 2 consistent with Part 21 and the associated guidance material? This is not so obvious. (2) Because the issue is not related to a deficiency in the design of the aircraft, it is assumed that EASA's policy with regard to ADs would be applicable here : EASA would not issue such ADs but would only make recommendation to NAAs to issue their own ADs. This point should be clarified.
response	*Partially accepted* In light of the comments received, the Agency decided to change way to address this issue in the short term. It has been agreed that in a first step, the Agency would send letters to TC Holders (for EU products) and to NAAs of the State of Design (for non EU products) informing them of the serious safety concern and requiring each type certificate holder. As a second step and only if after a reasonable timeframe the Agency considers that the manufacturers and operators have not responded appropriately to the information now available to them, the Agency may consider issuing Airworthiness Directives.

comment	*14* comment by: *Francis Fagegaltier Services* Explanatory note, § 11.1, option 5 : There was at least one recent case where the APU accelerated up to overspeed and burst when running on de-icing fluid only (fuel supply was shut off) during an airport de-icing operation on ground. Nowhere such case is openly addressed in this A-NPA. The wording of option 5 may lead to think that the APU certification specifications ("CS-23, CS-25, etc." = what does this "etc." cover ?) might need to be changed. An APU cannot be required to run on flammable fluids injected into the air inlet. The issue of APU usage during de-icing operation should be addressed in the NPA.
response	*Partially accepted* The Agency acknowledges the fluid application issues indicated by the commentator. The objective of this A-NPA is restricted to identifying means of action to mitigate concerns of frozen re-hydrated residues of thickened ground

de-icing/anti-icing fluids. The subject of de-icing fluid ingestion by APU and/or engines is already controlled by the information for application of these fluids. However, actions being taken with TC holders should further enhance this.

comment

21 comment by: *Flybe*

DESIGN

Page7 para 11.1 Option 2

This action has already been carried out by many Type Certificate Holders and the recommendations implemented, but the problem has not been resolved.

This is not a new solution but a repeat of what has been already instigated and in its self proven to not be an effective resolution.

It may be quick but of little use at this stage.

Page7/8 para 11.1 Option 3

Option 3 requires finance to enable the required research to be carried out and conclusions reached. This is an option if suitably financed could make a significant gain in Flight Safety, Finance should be found and it should be made a short term goal.

Page 8 para 11.1 Option 4

Option 4 used in conjunction with Option 3 would be most affective. It may be a long term action but should be started as an immediate action.

Page 8 para 11.1 Option 5

We believe it would be very difficult to totally seal the areas of an aircraft required to prevent fluid finding its way into the flight control system. Changing the Fluid to remove this unwanted characteristic is the only way to prevent the problem caused by residues.

Page 8 para 11.1 Option 6

Unsure what the MMEL can achieve!

Improvements to the Training of Flight Crew and Certifying Staff must always aid in resolving any potential Flight Safety Hazzard. However part of this problem is that neither of those groups are normally directly involved in carrying out the De-Icing of aircraft.

response

Partially accepted

1. The commentator refers to well-tried approach in reference to Option 2. The Agency assumes that this comment refers to non-AD related Option 2 actions, and shares this view. In terms of an AD-related Option 2 action, although no exhaustive research as yet been attempted by the Agency with respect to existing airworthiness action, it has no knowledge of published ADs in this matter. It should be however conceded that some closely related issues, for example ground cold soak wing on hard wing aircraft, have been the subject to ADs.

2. The commentator raises the question of financial support with respect to implementation of Option 3. This aspect is in part not critically relevant since the existing review process in SAE G-12 has been so far found suitable for the problem and cost are not an issue in the advancement in this process. However, should this process be found unsatisfactory, then the Agency would have to consider an alternate approach for which cost may become a significant factor.

comment *29* comment by: *Airbus*

The means to address the fluid residue problem should recognise the disparity between the problems that have been experienced on different aircraft. Some aircraft have experienced many serious incidents due to residues, others have experienced very few or none (this is the case for Airbus Fly By Wire aircraft fitted with powered Flight controls). In a general manner, the perimeter of application of this A-NPA (which type of aircraft) needs to be clarified.

Indeed, aircraft with non-powered flight controls tend to be more prone to fluid residue problems because the controls are easily 'upset' by relatively small amounts of contamination, for example around trim tabs. Airbus aircraft fitted with powered Flight controls have no adverse safety records related to frozen re-hydrated residues problem (e.g. control surface stiffness, control surface jamming, etc…)

We have the following comments on design / continued airworthiness options:

Option 2: The inspection and cleaning recommendations (for example: the intervals) should be based strongly on the extent of the problem for each particular aircraft, and the findings during the inspections. It does not appear logical to mandate frequent inspections for aircraft that have no history of residue problems, such as Airbus aircraft. EASA may wish to consider whether a recommended method for inspecting, reporting, cleaning and revising AMM recommendations can be established, to create consistency for all operators and aircraft manufacturers (ref to A-NPA maintenance Option 2)

Option 3 : The publication of current fluid residue characteristics would be very useful. If the characteristics are known to airlines/de-icing service providers it would allow them to buy the 'best' fluids and would therefore encourage fluid manufacturers to develop better fluids. The simplistic SAE G12 test for fluid residue formation is known to be imperfect, but the results are useful nevertheless. Further progress is needed in the development of laboratory tests to understand/correlate the residue formation problem on real aircraft.

Option 5 proposed by the A-NPA suggests that CS-25 might be modified to require aircraft manufacturers to check the sensitivity of future aircraft to de-icing fluids.

- Airbus considers that a satisfactory Means of Compliance is not available today to make this check. It is not known to what extent the problems are caused by poor sealing of cavities, poor drainage, specific weather conditions, gradual accumulation of residues, incorrect fluid application, control actuation method or mixing with runway de-icing fluids. Aircraft manufacturers do not operate aircraft, therefore it is difficult for them to know which factors cause or contribute to residue problems, and therefore to know what needs to be simulated in a test.

Reproducing all the in-service conditions is obviously not practicable.

- It is unclear if A-NPA design/option 5 is specific to residue formation rather than assessing the aerodynamic impact of the 'normal' characteristics of de-icing fluids. The SAE G12 Aerodynamic Working Group is currently developing a recommended practise (not a rule) for aircraft manufacturers concerning the evaluation of de-icing aerodynamic effects (flow-off behaviour**,** not residues).

Airbus opinion is that the fluid residue problem is not a general aircraft issue, being generally related to aircraft fitted with non-powered flight controls and consequently affecting only a limited population of aircraft.

Conclusion for design / continued airworthiness: Airbus recommends a combination of options 2 and 3.

response *Accepted*

1. The Agency agrees with the commentator on the need to recognize aircraft design specificity. Also the Agency agrees that, in general terms for the last ten years, the case of non-powered flight controls has been highlighted as the most prone to safety concern derived from fluid residue presence. However, the Agency is not aware to this day of any comprehensive study of incidents which could support definitive segregation of action between aircraft design features.
2. The commentator stresses the aircraft-dependant aspect of Option 2 actions, such as an AD, to which the Agency concurs.
3. The Agency acknowledges the commentator's support for Option 3 and its recommendation for a combination of Option 2 and 3. In reference to Option 3, the Agency recognizes that there are, through the yearly publication of FSAT, FAA-approved guidelines on ice holdover time capability for fluids which have successfully pursued AMS/ISO qualification. Transport Canada has a parallel publication tool, Transport Canada Holdover Time (HOT) Guidelines, which is carefully synchronized with the FSAT. The Agency agrees that a similar listing could be established with respect to residue properties. Testing methods are not defined in identical framework (AS 5485 for HOT while it is located in an Appendix of AMS 1428 for residues) but this has no relevance to the industry and authority recognition of the testing procedures. In a similar manner, as HOT values are published, the residue results could be listed for AMS/ISO qualified fluids. The Agency would expect the industry to decide its preferred reporting format: exhaustive data or severity level. Depending on the A-NPA final review, discussions regarding feasibility of this process could be initiated. In these discussions, it is expected that a main subject will be the opportunity to associate to the listing specific fluid application method recommendations.
4. In reference to Option 3, the commentator alludes to the issue of degree of refinement of existing testing methods (AMS 1428 Appendix D). The Agency wishes to insist on the danger of pursuit of high sophistication in opposition to added practical value. Existing testing procedure maturity should be assessed for immediate use.
5. The Agency acknowledges the commentator reservation in reference to Option 3, as to the feasibility of identification of the design role in the development of fluid residues. It should be noted that the question is two-fold: Firstly, will a given fluid produce residue amounts that are of safety-

concern? Can the aircraft safety be impacted by the residue potential? It is obvious that if the first question is satisfactorily answered, then addressing the second question is not critical.

6. The commentator stresses the general wording existing in the writing of Option 5, which may introduce some confusion that "aerodynamic impact" as a whole is considered by the A-NPA. The Agency agrees that confusion may result from its A-NPA wording and, therefore, wishes to reiterate that the NPA objective is restricted as stated in EASA response to comment 14.

comment *57* comment by: *AEA*

AEA Comment 1

AFFECTED PARAGRAPH

A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 11. Design/Continued Airworthiness related to design
11.1 – 11.2 Design / Continued Airworthiness related to design
COMMENT
11.2 Option 4 should be re-considered by EASA (formal qualification of fluids). An SAE document currently under development, SAE ARP 5718, describes in full the qualification process for SAE AMS 1424 and SAE AMS 1428 fluids, but SAE does not qualify or certify fluids itself. This is only carried out by FAA and Transport Canada.

EU airlines currently have to refer to an FAA or TC 'qualified fluids' list, or accept the fluid manufacturer's assurance that the fluid meets the SAE specification, unless they have suitable resources within their own airline to make a judgment based on the information available from the fluid manufacturer (most do not).

Considering that SAE 5718 will be available in the near future as a qualification framework, and the SAE G-12 committee provides a ready opportunity to participate with FAA and TC on this issue, this should be a medium term action.

EU airlines should not have to rely on North American regulators for fluid qualification. Fluid manufacturers have a commercial interest, and so operators should not rely upon manufacturer's information regarding the qualification status of a fluid. EASA should participate with the FAA and Transport Canada in the fluid qualification process and publish their own annually revised list. Whilst, in most cases, the list would be identical to the FAA/TC list, EASA would have the option of suspending a particular fluid's qualification, in response to an identified safety issue.

response *Partially accepted*

1. In reference to Option 4, the commentator stresses the type of qualification process being currently in place for de-icing/anti-icing fluids. The Agency acknowledges the fact that SAE does not "qualify or certify fluids itself". The Agency was not aware of the development of ARP5718 in relation to qualification process and agrees with the commenter that this activity may represent some degree of implementation of Option 4. In this perspective though, it would be necessary that this ARP development actually establishes a "qualifying framework" and not just provides a comprehensive description of the existing process.

2. Furthermore on Option 4, it is of the understanding of the Agency that, contrary to the commentator statement, neither FAA nor Transport Canada does carry-out this responsibility. Some degree of recommendation is conveyed by these authorities (see **response to comment 29, point 3**), but to Agency knowledge, there are no authority-approved fluids. This is a general policy by Airworthiness authority, the Agency does not identify yet a need to depart from this position for the ground de-icing/anti-icing fluids residue issue. This is the motivation for the Agency not to list Option 4 among the preferred means of action.
3. In reference to the commentator's discussion of residue performance listing, the Agency wishes to indicate that such listing is covered in Option 3, detailed in **response to comment 29, point 3,** not to be confused with fluid "certification" which is considered in Option 4. The Agency recognizes the difficulty of regional differences in terms of severity of the residue problem. This is due to differing operational configuration of fluid supply, as it exists typically between EU and north-American airports. Therefore there is ground to consider an EU based publication process. However, the Agency is aware of the technical implication of a yearly publication process and currently does not have the required resources to implement it. Furthermore, the last thirty year of standard development of ground de-icing/anti-icing product, the industry worldwide has achieved a remarkable level of consensus and there is a significant risk to compromise this consensus by developing alternate consultation and sanction process. Therefore the Agency would preferably consider the implementation of the listing detailed in **response to comment 29, point 3** within the FSAT publication process.

comment

69 comment by: *Transport Canada Civil Aviation Standards Branch*

Although the A-NPA refers (in paragraph 9.4 and 11.1 Option 5) to certification requirements relating to the use of de-icing/ anti-icing fluids, this is in the context of the problem of hazards associated with residue fluid causing flight control problems.

There also have been a number of problems on different aircraft types due to an adverse effect on aircraft takeoff performance and handling characteristics due to incomplete fluid flow off from the wing and tail at rotation. This currently is not addressed in the certification requirements and it is recommended that this aspect be included in the development of the NPA.

response

Partially accepted

1. The Agency acknowledges the commentator's reference to fluid flow-off issues. There maybe some significant physical connection between flow-off process and residue accumulation. It maybe considered that rotation aerodynamic characteristics have not adequately activated the pseudo-plasticity rheology of the fluid, and, consequently, that the "insufficient" liquefaction may increase accumulation in quiet areas. However, the objective of this NPA is restricted to identifying means of action to mitigate concerns of re-hydrated gels of thickened ground anti-icing fluids. The Agency considers at this time that there are courses of action independent of the flow-off characteristics and is intent to pursue this as the most promising approach until efforts demonstrate otherwise.

comment	*72* comment by: *Cessna Aircraft Company* Cessna Aircraft Company In reply refer to E390-07-3549 Option 3 presented in Section 11.1 states that current industry material standards, ISO 11075 & 11076 and SAE AMS 1424 and 1428 should be amended to adequately address fluid residue characteristics. This text should be revised to delete the references to ISO 11075 and AMS 1424 as these are specifications for un-thickened fluids. Un-thickened fluids do not contain the thickeners which lead to the gel residue issues.
response	*Accepted* The Agency agrees with the commentator in relation to Newtonian fluids but refers to **EASA response to comment 1, point 2.**

comment	*73* comment by: *Cessna Aircraft Company* Cessna Aircraft Company In reply refer to E390-07-3549 Option 4 considers bringing the formal qualification of fluids into a regulatory framework. If this option is chosen, EASA could chose a phased approached where current fluids with safe levels of residues are deemed acceptable and the allowable residue requirement is reduced over a multi-year period. This would allow fluid manufacturers to work to the same standard as well as have a projection of where the requirements for the fluids would be in the future. Option 5 recommends amending the current Certification Specifications (CS-23, CS-25 etc.) to require future aircraft designs include an evaluation of the sensitivity to problems related to the use of de-icing/anti-icing fluids. This option may have limited feasibility, as it is not possible for an aircraft manufacturer to predict all the variations that occur in the operating environment (anti-icing frequency, de-icing/anti-icing methods, weather patterns, etc.), or to anticipate the effects of future de-icing/anti-icing fluids. At a minimum, Cessna requests that advisory material accompany this rule change to ensure the proper range of environmental conditions and operational issues are tested while evaluating fluid residues.
response	*Noted* 1. In reference to Option 4, the commentator suggests the use of a "phased approach" as to the required residue level. The Agency is open to this strategy in reference to potential recommendations associated to Option 3 listing discussed in **response to comment 57, point.3**. 2. The commentator states that Option 5 "may have limited feasibility" due to "all the variations that occur in the operating environment". Although the Agency agrees with the commentator and, also, do not consider Option 5 as a realistic short or medium term action, it should be retained as a long term potential course of action. Although the regulatory framework is different than for Option 2 (typically issuance of an AD), the rationale discussed in **response to comment 13, point 2** is also applicable. 3. The commentator's request of Advisory Material associated to any CS-23 or CS-25 rule is well noted.

comment 75 comment by: *Walter Gessky*

V. Possible EASA actions and timescales, 11.1 Options (page 7)

Option 2:

Change the following:

It may be considered appropriate to require Type Certificate Holders to review their current

information and investigate **about the impact of the application of de-icing/anti-icing fluids on the aerodynamic (stall speed, drag etc) of the aircraft** and publish additional material to identify the recommended **de-icing/anti-icing** fluids and practices for the application of **this** de-icing/anti-icing fluids, the methods for identifying residues and the processes for removal of such contaminants, where this is not already available.

Justification:

When the TC holder recommends practices for the application of de-icing/anti-icing fluids than he should have investigated about the impact with regard to lift and drag of the type of fluid used , provide information which type of fluid can be used similar to the recommendation for lubricants, oil fuel etc.

The type of fluids to be used and the impact of the characteristics of fluids should have been evaluated by calculation and tests, when the fluid to be used is addressed in the Operating Manual.

The fluids have to be defined by an adequate standard and the provider of the fluids has to grant minimum delivery standards.

response *Noted*

The Agency acknowledges the commentator's suggestion to increase the scope of the NPA to all aerodynamics issues but refers to the NPA scope as indicated in the **response to comment 14.**

comment 76 comment by: *Walter Gessky*

V. Possible EASA actions and timescales, 11.1 Options (page 7)

Option 3 second sentence:

Add the following after (d):

(**e) minimum delivery standards for the fluid providers.**

Justification:

The fluid provider should have an adequate quality system to declare that the delivered fluid complies with the relevant industry standard.

The responsibility of the fluid manufacturer to deliver the correct fluid is not mentioned in the NPA. This should be similar to a material manufacturer.

response

Noted

1. The Agency shares the commenter's concern about "minimum delivery standards for the fluid providers". However, it should be stressed that the matter is already heavily addressed through specific standards such as AIR5704, AIR9968 which, as much as possible, connect testing procedures set in AS5900, AS5901, ARP5945 & AS5485 to material specifications of AMS1424 & AMS1428 and application methods set in ARP4737. Consequently, the Agency considers at this time that fluid quality at delivery is not a predominant factor in fluid residue concerns and therefore does not intend to enlarge the scope of the NPA as indicated in **response to comment 14.**
2. Furthermore, the Agency plans to introduce into the rulemaking inventory a task to extent the Agency's remit to fluids and materials in addition to parts and appliances. Such a task would be preceded by an A-NPA to explain and consult on the concept (long-term).

comment

90 comment by: *Bombardier*

Option 5:

The unpredictable and insidious nature of residue accumulation and the consideration of improper spraying techniques (e.g. spraying from the rear into openings in the wing), will make it practically impossible to model residue formations in order to facilitate development of design solutions.

This option implies that the in-service residue problem will always exist and aircraft designs and operating practices will have to be adjusted to cope with them. Our position is that current in-service aircraft will not benefit from option 5.

Option 6:

This option requires the development of aircraft design solutions (see above comments on Option 5) and retrofit to existing fleets, which Bombardier believes is an expensive option. We suggest revisiting this option to come up with more cost effective solutions.

response

Partially accepted

1. The Agency acknowledges the commentator position of "no benefit" on Option 5 estimating that it may be "practically impossible to model residue formations". The Agency does not share this view and considers that analysis could achieve a sufficient level of refinement to indicate favourable and unfavourable design. The Agency however agrees with the reservation of the commenter as to the likelihood of deriving an effective Option 5 course of action from such information.
2. The Agency concurs with the commentator consideration of Option 6 as an "expensive option". Although such option should not be definitively ruled out, it will only make sense if some implementation of Option 5 has been identified as suitable, therefore the Agency does not retain Option 6 as an effective subject of discussion at this time.

comment 93 comment by: *Boeing*

Section V, paragraph 11.1, Options

Page 7 -- *Option 2*
Boeing concurs with the pursuit of Option 2. We currently provide this type of information via the Airplane Maintenance Manual, Service Letters, and Boeing "Aero" magazine articles.

response *Partially accepted*

The Agency acknowledges the commentator concurrence with Option 2. The Agency agrees that aircraft manufacturers do provide pertinent information on residue issues to their operators. The Agency is nonetheless concerned by the seemingly lack of effectiveness of this information in regards to operational constraints encountered by some operators. The main purpose of this A-NPA is to identify avenues to complement existing non-AD related Option 2 actions, which are expected to be still supported and improved if possible.

comment 94 comment by: *Boeing*

Section V, paragraph 11.1, Options

Page 7-8 -- *Option 3*
Boeing also concurs with the pursuit of Option 3. We also encourage the participation of EASA in the SAE G-12 Aircraft Ground De-icing Committee, which governs the SAE AMS1424 and AMS1428 specifications with which all currently approved de-icing/anti-icing fluids must comply. The G-12 subcommittees are a valuable forum for pursuing safety improvements with regard to fluids issues.

response *Accepted*

The Agency acknowledges the commenter concurrence with Option 3 and agrees with the proposed vehicle of implementation. The Agency offers further detailing of Option 3 implementation in **response to comment 29, point 3**.

comment 95 comment by: *Boeing*

Section V, paragraph 11.1, Options.

Page 8 -- *Option 5*
Boeing does not concur with the pursuit of Option 5. We consider that this option is not a realistically feasible solution to the residues issue. We do not consider it practical, or even possible, to design an airplane so that no fluids can enter areas where flight control, hydraulic, and electrical systems reside. Even if it were possible, the economic impact to the airline operator would be significant, most likely due to the added weight of materials required to attempt such a design. Furthermore, not all airlines operate in an environment that requires the application of de-icing/anti-icing fluids, or some airlines may only undergo de-icing/anti-icing a small amount of the time, and therefore the economic impact would unfairly affect them as well. As noted in the A-NPA's Regulatory Impact Assessment (Section B, Attachment 1), the economic impact of imposing such a requirement on aircraft manufacturers, and hence the airline industry as a whole, would be significant.

When considering how long the de-icing/anti-icing fluid residue issue has been

an industry concern and how much information is currently being provided to operators of in-service aircraft, it is highly questionable whether new certification investigations by aircraft manufacturers and the resulting information for operators of future designs will have a significant impact on safety. We believe that providing operators with information regarding fluid characteristics and residues, safest-practice use of the fluids, and maintenance for residues (Option 2), without amendment of the Certification Specifications, is a much more realistic way to ensure safe operation of aircraft during weather that requires the application of de-icing/anti-icing fluids.

response *Not accepted*

The Agency acknowledges the commentator non concurrence on Option 5 based on practicality of design solution. The Agency shares same reservation as to design modifications; however the Agency does not agree to the restricted interpretation made by the commenter and refers to its position in **response to comment 13, point 3**.

comment *96* comment by: *Boeing*

Section V, paragraph 11.1, Options

Page 8 -- *Option 6*
Boeing does not concur with the pursuit of Option 6, for the same reasons we have given (in our comments) for non-concurring with Option 5.

response *Noted*

EASA acknowledges the commentator's non concurrence on Option 6 and refers to its position in **response to comment 90, point 2.**

comment *101* comment by: *Ken Mutton (CityJet)*

CityJet feel that Option 4 - 'Regulatory frame work for de-icing fluids' - should be adopted over option 3. As de-icing fluids form the whole basis for the requirement for the issuing of the NPA, and that the issue has a direct flight safety impact, there would appear to be a fundamental need for regulatory action. As a minimum the fluid manufacturers should be obliged to publish the gelling properties of their various fluids. This would, as a minimum, allow operators to make informed decisions as to what fluids are applied to the aircraft and the cleaning and inspection regimes employed. As I understand the current situation the fluid testing procedure / Standard has now been established with some data available, this information should be made available to operators as soon as possible to allow for informed choices to be made on the de-icing processes and practices employed.

Additionally if the option 3 is adopted, it is felt that EASA should be obliged to participate in the Forums and working groups relating to the fluid development as a matter of course.

response *Accepted*

1. The Agency acknowledges the commentator concurrence with Option 4. The Agency agrees with the necessity "to publish the gelling properties" but considers that the regulatory framework of Option 4 is not needed. The Agency believes that the implementation details of Option 3 given in **response to comment 29, point 3** provide acceptable vehicle to obtain

the requested action.

2. Further on the commentator's suggestion of reporting obligation, it should remain clear that airworthiness authorities such as the Agency cannot directly require and enforce technical information on fluid manufacturers. The process to be effective must recognize and accommodate the confidentiality of proprietary information. The FSAT publication is a non-regulatory successful process in this respect.

comment

104 comment by: *European Cockpit Association*

11.2 Recommend option 6 in addition or in lieu of option 5

As an association we should always press for the greatest safety enhancements.

response

Partially accepted

The Agency acknowledges the commentator's concurrence with Option 6 and shares the commitment indicated. However, the Agency reservation is indicated in the **response to comment 90, point 2**.

comment

111 comment by: *UK CAA*

Paragraph 11.1, Option 2.
Considering that Type Certificate holders are already actively involved with operators on this issue, option 2 will probably only have a small impact and only if the recommended actions are published through an airworthiness directive, as suggested.

response

Accepted

The Agency shares the commentator's view on Option 2. The Agency position in this matter is indicated in **response to comment 13, point 3** and **response to comment 93, point 1.**

comment

112 comment by: *UK CAA*

Paragraph 11.1, Option 3.
ISO 11075 relates to type I fluid only, which is not believed to cause control restrictions. ISO 11076 relates to methods of application, whereas ISO11078 relates to non-Newtonian types II, III and IV fluids but is not mentioned in this A-NPA. SAE AMS 1424 relates to type I fluid and 1428 to types II, III and IV. Please confirm with SAE whether any changes in materials specifications will apply to new products only or can be retrospectively applied to products that are already available. Regarding (b), reporting of material specifications will need to occur annually and therefore should be published separately from the material standards, which are updated less frequently. Updating the material standards in their entirety every year will be costly to all involved. Clarification is needed for part (c) of this paragraph - ARP 4737 is aimed at the safe removal/prevention of ice on an aircraft, perhaps it would be better to use the outputs of (b) to modify inspection and cleaning regimes. Surely any fluid that is identified to cause residue problems should be prevented from being used to de-ice aircraft with non-powered flight controls.

response

Accepted

1. The commentator clarifies objectives of ISO/AMS specifications. The Agency agrees with the clarification; see also **response to comment 1, point 1**.
2. The commentator raises the issue of retrospective application of potential change in fluid specification. The Agency considers that such issue depends on action being used. If a yearly publication of some kind of residue values is implemented (as HOT in FSAT), it will automatically produce retrospective action on existing fluids in terms of its use (when, how and on which aircraft it can be applied) but would not affect its AMS/ISO qualification. However, if a residue level requirement was to be implemented as part of the specification that could lead to qualification issues of existing fluid. It may be that SAE standard policy restricts such kind of retrospective sanction.
3. The commentator challenges the possibility of having residue reporting set within existing material standards (AMS/ISO). The Agency shares this concern and refers to **response to comment 1, point 3.**for clarification of its position.
4. The commenter proposes yearly publication of residue data. The Agency shares this view and discuses it in detail in **response to comment 29, point 3.**
5. The commentator indicates that "non-powered flight controls" aircraft should be clearly restricted to non-residue fluids. The Agency envisions this type of action within the framework of a combination of Option 2 and 3. The Agency is aware of CAA-UK authority's positive steps in this direction, However, the NPA scope must encompass all potential situations of concern. Therefore, an appropriate segregation criteria for residue (Option 3), a data publication process (Option 3) and the type of mandatory action (Option 2) need to be defined.

comment *113* comment by: *UK CAA*

11.1, Option 5 and Attachment 1 paragraph 1
It is considered that **'Option 5'** should also be adopted either as a whole or in part within the CS documents especially for aircraft without powered flight controls.
Justification:
This would catch the many CS23 JET aircraft that are awaiting certification, nearly all of these aircraft do not have powered flight controls and may well suffer from this phenomenon in the future

response *Noted*

The Agency acknowledges the commentator's support on Option 5. The Agency has indicated, in its A-NPA, Option 5 as potential means of long-term action but clarification in this matter is indicated in **response to comment 95, point 1,** qualified by **response to comment 13, point 3.**

A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 12. Operations p. 8-9

comment *15* comment by: *Francis Fagegaltier Services*

Explanatory note, § 12.2, option 2 :
The issue of APU usage during de-icing operation should be addressed in the

NPA (see comment on §11.1 option 5).

response

Partially accepted

The Agency acknowledges the fluid application issues indicated by the commentator. Although there maybe parallel courses of action to address residue issues and application method, the objective of this A-NPA is restricted to identifying means of action to mitigate concerns of frozen re-hydrated residues of thickened ground de/anti-icing fluids.

comment

22 comment by: *Flybe*

Page 9 para 12.2

Option 1 Do nothing

Option 2 Provides an opportunity to review the oversight and management of de-ice/anti-ice service providers, including the availability of various fluid types. It would also encompass training recommendations.

This is exactly what we have been begging for. However the envisaged option is Option 1, DO NOTHING.

response

Noted

The Agency had proposed option 1 (do nothing) over option 2 (changes to requirements/guidance material on operations) as the provisions contained in EU-OPS and JAR-OPS 1 are in any case being presently transposed to become implementing rules for the Basic Regulation. In the process of the development of implementing rules (IRs) and Acceptable Means of Compliance (AMCs) for operations, stakeholders will soon be consulted on the relevant JAR-OPS 1 transposition, namely JAR-OPS 1.345 and 1.346 and associated AMCs. If stakeholders consider all or some elements of option 2 necessary, they are invited to respond accordingly to the forthcoming NPA on Air Operations, which is currently scheduled to be published in September 2008. Any comments received could then be considered for inclusion with the new implementing rules which may enter into force as early as end of 2009.

comment

31 comment by: *Airbus*

Airbus strongly urges EASA to regulate/harmonize the Airlines requirements for de-icing provided to the Service Providers. This may mean referring to a specific source e.g. AEA (Association of European Airlines) or SAE De-Icing procedures and training recommendations.

Justification:

Airlines provide Service Providers with their own requirements for de-icing and these need to be harmonized. The use of inappropriate fluid application techniques (such as spraying from the rear) may accentuate the problem.

Conclusion for operations: Airbus recommends option 2.

response

Noted

The operations provisions contained in EU-OPS/JAR-OPS 1 (namely JAR-OPS 1.345 and 1.346 and associated AMCs) are presently being transposed to

become implementing rules for the Basic Regulation. In the process of the development of implementing rules (IRs) and Acceptable Means of Compliance (AMCs) for operations stakeholders will soon, be consulted on the this transposition. Stakeholders could respond to the forthcoming NPA on Air Operations, which is currently scheduled to be published in September 2008, with proposals on how to achieve harmonization on operator requirements for service providers. Any comments received could then be considered for inclusion with the new implementing rules which may enter into force as early as end of 2009.

As a separate course of action which could contribute to the desired harmonization, the Agency intends to address type certificate holders to gather type specific information regarding instructions and procedures for the correct application of de-ice and anti-ice fluids onto their products. Once these instructions have been defined, operators would have to incorporate them into their Operations processes in accordance with Regulation (EC) No. 1899/2006, Subpart D (Operational Procedures) para 1.345(a), Subpart M (Aeroplane Maintenance) para 1.875 and Subpart P (Manuals, Logs and Records) para 1.1045 and associated Appendix (with specific reference to para 8.2.4).

comment

77 comment by: *Walter Gessky*

V. Possible EASA actions and timescales, 12.2 Options (page 9):

Option 2, change the following:

- the assessment, oversight and management of de-icing/anti-icing **fluid provider and** service providers.

Justification:

It is important that the fluid providers are in the chain because they have to declare that the fluid delivered is in compliance with the referenced standard.

response

Noted

The Agency plans to introduce into the rulemaking inventory a task to extent the Agency's remit to fluids and materials in addition to parts and appliances. Such a task would be preceded by an A-NPA to explain and consult on the concept (long-term).

Secondly, see also response to comment 76.

comment

105 comment by: *European Cockpit Association*

12.3 Recommend option 2, Disagree with RIA recommend for option 1

No timescale is evident for 1592/2002 amendment; additionally the enhanced safety requirements of CFR 14 are echoed.

response

Noted

The Agency had proposed option 1 (do nothing) over option 2 (changes to requirements/guidance material on operations) as the provisions contained in EU-OPS and JAR-OPS 1 are in any case being presently transposed to become implementing rules for the Basic Regulation. In the process of the development of implementing rules (IRs) and Acceptable Means of Compliance (AMCs) for operations stakeholders will soon, be consulted on the relevant JAR-OPS 1

transposition, namely JAR-OPS 1.345 and 1.346 and associated AMCs. If stakeholders consider all or some elements of option 2 necessary, they are invited to respond accordingly to the forthcoming NPA on Air Operations, which is currently scheduled to be published in September 2008. Any comments received could then be considered for inclusion with the new implementing rules which may enter into force as early as end of 2009.

comment *114* comment by: *UK CAA*

Paragraph 12.2 and Attachment 2
The operational options considered are large changes to EU-OPS or doing nothing. No consideration has been given to intermediate operational measures that could be introduced when EASA become a competent authority for aircraft operations, for example an EASA Safety Information Notice.

response *Accepted*

The Agency has already issued a Safety Information Notice (SIN 2008-29) on 4 April 2008 which gives guidance on this subject. A review and updates of this document is under consideration.

See also response to comment 105.

comment *115* comment by: *UK CAA*

12.3 line #3
Attachment reference incorrect
Delete "…attachment 1" and add "attachment 2".
Justification:
Factual error.

response *Accepted*

Correct, the RIA for operations is found in attachment 2.

A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 13. Maintenance p. 10-11

comment *23* comment by: *Flybe*

MAINTENANCE

Option 1 and Option 2 will have similar affect in practical terms as those companies and individuals carrying out the majority of de-icing are not affected directly by either, Part 145 or Part 66.

In fact it is possible that increasing a training burden on those companies who would be affected, could have a negative affect by encouraging them to contract out the work to companies not so burdened.

response *Noted*

The may be a slight misunderstanding of the function of our proposals in the area of Maintenance. The training burden on maintenance organisations is about improving the engineers' knowledge of how to find and remove residues during the maintenance cycles and is not about training of those who apply the

fluids for de-icing/anti-icing activities.

comment

37 comment by: *Airbus*

Airbus supports the development of appropriate AMC to maintenance rules, with a link to the TC holder recommendations that would be issued under option 2 for design / continued airworthiness.

Conclusion for maintenance: Airbus recommends option 2.

response

Noted

The Agency agrees with the fact that operators should review their maintenance programme according to PART M.A.302 (f) and (g) as per Opinion EC n°707/2006 of 8 May 2006, once the Type Certificate Holder (TCH) publishes the maintenance instructions related to the use of the de-icing fluid.

In the first step, the Agency would send letters to TC Holders (for EU products) and to NAAs of the State of Design (for non EU products) informing them of the serious safety concern and requiring each type certificate holder of large aeroplanes (as defined in CS-Definitions) and of commuter aeroplanes (as defined in CS-23) to review and amend as necessary, taking into account published information on fluids re-hydration:

- Their published instructions and procedures for the correct application of de-icing and anti-icing fluids onto their products, and
- Their maintenance instructions for the aircraft upon use of such fluids.

The purpose would be to include or improve instructions as to:

- What to look for (e.g. gel and dried residues),
- Where to look for anti-ice residue in the aircraft structure, and
- How to remove these residues effectively.

In addition the maintenance instructions should give guidelines for operators on how to determine the frequency of the necessary checks. Existing published information on fluid's re-hydration could be usefully taken into account when defining the M.A.302 maintenance programme. It is foreseen that the Agency will require that the review and necessary amendments should be available to operators prior to the 2008 winter operation for aeroplanes that are most susceptible to the phenomenon (usually those equipped with one or more non-powered flight controls) and prior to 2009 winter operations for the others. If TC holders consider their aeroplanes as being less sensitive or not affected, this should be justified.

When these instructions have been defined by TC holders, European operators would have to incorporate them into their maintenance programme in accordance with Part-MA.302 (f) and (g) and into their Operations Manual in accordance with EU-OPS Subpart P. To further support these actions the Agency will issue an NPA to suggest changes to Part-M in order to better address the consequences of de-icing and anti-icing fluids on continuing airworthiness.

comment

106 comment by: *European Cockpit Association*

13.6 Agree with RIA recommend for option 2

response

Noted

comment 116 comment by: *UK CAA*

Paragraph 13 and attachments 3, 4 and 5
No timescale has been given for the Maintenance Actions. Regarding attachment 5 - acceptable means of compliance to part-145, there is no need to inspect for fluid residues if the aircraft has never come into contact with types II, III or IV anti-icing fluids, since these are the only types that leave residues capable of rehydrating and freezing. Type I fluid does not leave re-hydratable residues.

response *Noted*

In the first step, the Agency would send letters to TC Holders (for EU products) and to NAAs of the State of Design (for non EU products) informing them of the serious safety concern and requiring each type certificate holder of large aeroplanes (as defined in CS-Definitions) and of commuter aeroplanes (as defined in CS-23) to review and amend as necessary, taking into account published information on fluids re-hydration:

- Their published instructions and procedures for the correct application of de-icing and anti-icing fluids onto their products, and
- Their maintenance instructions for the aircraft upon use of such fluids.

The purpose would be to include or improve instructions as to:

- What to look for (e.g. gel and dried residues),
- Where to look for anti-ice residue in the aircraft structure, and
- How to remove these residues effectively.

In addition the maintenance instructions should give guidelines for operators on how to determine the frequency of the necessary checks. Existing published information on fluid's re-hydration could be usefully taken into account when defining the M.A.302 maintenance programme. It is foreseen that the Agency will require that the review and necessary amendments should be available to operators prior to the 2008 winter operation for aeroplanes that are most susceptible to the phenomenon (usually those equipped with one or more non-powered flight controls) and prior to 2009 winter operations for the others. If TC holders consider their aeroplanes as being less sensitive or not affected, this should be justified.

When these instructions have been defined by TC holders, European operators would have to incorporate them into their maintenance programme in accordance with Part-MA.302 (f) and (g) and into their Operations Manual in accordance with EU-OPS Subpart P. To further support these actions the Agency will issue an NPA to suggest changes to Part-M in order to better address the consequences of de-icing and anti-icing fluids on continuing airworthiness.

comment 117 comment by: *UK CAA*

13.6 line #3
Attachment reference incorrect
Delete "…attachment 1" and add "attachment 3".
Justification:
Factual error.

response | *Accepted*

EASA agrees with the comment but the text of the NPA will not be corrected.

A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 14. Service Providers p. 11

comment | *3* comment by: *Chair of Residue Workgroup, SAE*

For Option 2:

Many airports only have one available service provider in which case he has a monopoly on what fluids he stocks, how he performs his procedure etc. Simple economics say that the fluid and service that he will provide will be dictated by the majority user(s), and these are rarely operators of the smaller regional jets who are suffering the issue. Any monopoly needs to be regulated especially when it can affect flight safety, as the normal forces of supply and demand do not work. Therefore, option 2 may bring about a small increase in safety, but should be an improving measure until EASA are able to regulate the service providers.

Also, standards and monitoring programmes are already in place and are not preventing incidents from occurring.

response | *Noted*

The Agency notes that chair of the SAE working group is for option 2 in the short term but is looking forward to the time when the Agency can more firmly regulate the service providers and aerodromes. However, in the forthcoming proposal (NPA) for the Agency air operators rules and the proposal to amend the Basic Regulation to the area of aerodromes and ATM, a direct regulatory control and certification of the ground handlers is not foreseen.

Additionally, the Agency notes that SAE's comment is a little ambiguous as to whether or not standards would have any positive effect.

comment | *10* comment by: *Airline Services*

I am, and have stated so on many occasions, strongly in favour of Option 3. This is despite the fact that I represent a service provider. As indicated, this is currently outside the scope of EASA – but should it be so? Without regulation, there will be **no change** – time has proven that.

Perhaps a 'standard' should be agreed, or even dictated by EASA; and service providers would be licensed to work within a standard. They would perhaps not necessarily have to comply with every aspect of the standard, but the standard would have to be upheld in respect of fluid, equipment and staff numbers. Compliance would be checked by individual NAAs.

For instance, if a service provider chose to supply just Type 1 fluid, then that service provider would have to comply with the agreed standard to supply such fluid in every respect – that is, storage, de-icing rigs, care of fluid, training of staff, etc.

With regard to Type II and Type IV, the fact that this particular service provider did not supply these fluids would mean that he would not have to

	comply with the requirements for those fluids: likewise, proportional mixing of fluid in the rigs - if the service provider's rigs did not have such a system, then he would not have to comply with that particular aspect. However, he would need to show compliance with an alternative that was part of the agreed standard.
response	*Partially accepted* The Agency finds it interesting that a service provider prefers option 3 although they would potentially be affected by it. They think that this area should become part of the Agency remit and they would like a standard to be imposed and service providers to be required to work within that standard. However, the Agency has to refer to the limitations due to lack of jurisdiction in this area at the moment and the response given under comment 3, as to what is planned for the future. The Agency would like to know if this view is representative among service providers.

comment	*24* comment by: *Flybe* SERVICE PROVIDERS Page 11 Para 14.1 Correct this is what a large number of companies are requesting. Para 14.2 Option 2 this self regulation is where we are at this time. IT DOES NOT WORK. Para 14.3 The envisaged option is "2" It is effectively no change.
response	*Partially accepted* The Agency notes that this regional airline supports option 3 and wants that de-icing service providers be regulated as are other critical service providers such as fuelling companies. The Agency notes that all (regional) airlines support option 3 and recognizes the call for action. As mentioned in response to comment 3 above the Agency would, as proposed by the Commission legislative proposal, only be able to regulate aerodromes and de-icing service providers only indirectly. In any case this extension would only come into effect with implementing rules and AMCs in September 2011 as currently estimated.

comment	*30* comment by: *Airbus* Airbus strongly urges EASA to regulate the icing Service Providers, to control the fluid as it is being applied.

	Justification: Most de-icing personnel are seasonal workers and consequently high turnover of people and associated loss of experience may appear. Although training exists, there is no apparent quality system to harmonize the application of training. Conclusion for service providers: Airbus recommends option 2 or preferably option 3.
response	*Noted* The Agency notes the concerns and refers to responses given to comments 3, 10 and 24.

comment	*51* comment by: *European Regions Airline Association* Paragraph 14.1 states "Safety Recommendations 2005-148 and 09/06, supported by the views held at the above mentioned ERA Workshop, considered that the de-icing/anti-icing service providers should be licensed (regulated) thus bringing them in line with other critical service providers, for example fuel provisioning." The above comment within this A-NPA supports my earlier comment in respect of paragraph 10.
response	*Partially accepted* European Regions Airline Association (ERAA) prefers option 3 and would like to bring the service providers and the aerodromes into the regulatory realm of the Agency. The Agency notes that all (regional) airlines support option 3 and recognizes the call for action but refers to responses given to comments 3, 10 and 24 where the limitations are outlined. The Agency also would see benefits in direct certification requirements on de-icing companies.

comment	*52* comment by: *European Regions Airline Association* Paragraph 14.2, option 3 states "Regulatory approval of service providers: it may be considered that regulatory approval of service providers is necessary to achieve an acceptable level of safety **(this option is currently outside the scope of the Agency).** Whilst accepting that the final words of this option are true at this time, the same is also true of the only real rulemaking option identified within this A-NPA (the RIA in Attachment 7 -Rulemaking. Some mechanism is required to ensure that the range of de-icing and antiicing fluids is made available at all appropriate locations). At this time re regulation of Aerodromes does not fall within the competence of the Agency. Can the Agency please clarify this situation and advise what needs to happen to: • bring the service providers inside of the Agency's scope • regulate the Aerodromes prior to them falling under EASA's competence
response	*Accepted*

European Regions Airline Association (ERAA) prefers option 3 and would like to bring the service providers and the aerodromes into the regulatory realm of the Agency.

The Agency notes that all (regional) airlines support option 3 and recognizes the call for action but refers to responses given to comments 3, 10 and 24 where the limitations are outlined. The Agency also would see benefits in direct certification requirements on de-icing companies.

In addition in accordance with the core feedback from respondents, the Agency is also envisaging other medium and long term actions in coordination with FAA and TCCA as appropriate:

- Continue to take note of activities and progress made by the relevant SAE Committee and sub-groups on this subject and provide input as necessary (long term).
- Make proposals to the European Commission for studies to evaluate the feasibility of introducing in CS-23 and CS-25 a criterion for establishing sensitivity to fluid residues (long-term).
- Investigate and recommend the means by which Aviation Authorities of Member States manage matters in regard to the certification of service providers, availability of fluids at aerodromes, etc (mid-term).
- Make, as far as possible, provisions in the implementing rules on the safety of aerodromes with a view to make the operations of de-ice/anti-icing service providers safer and ensure the availability of fluids; (mid-term).
- Consider input from stakeholders regarding amendments to the operational rules on de-icing/anti-icing, during the impending NPA consultation process of the implementing rules for air operations to Basic Regulation (medium-term).
- Plan to introduce into the rulemaking inventory a task to extent the Agency's remit to fluids and materials in addition to parts and appliances. Such a task would be preceded by an A-NPA to explain and consult on the concept (long-term).

comment *78* comment by: *Walter Gessky*

V. Possible EASA actions and timescales, 14. Service Providers (page 11)

Option 2 change the following:

Encourage the development of industry standards and industry monitoring programme**s for the fluid provider or service provider:** it may be considered that industry standards and monitoring programmes may bring an appropriate increase in safety.

Justification:

The monitoring programme should be either a responsibility of the fluid provider's quality system or this has to be done by the service provider.

response *Partially accepted*

The Agency notes that Austria wants industry standards and monitoring

programmes for either the fluid providers or the service providers. However, there are clearly potentially grave problems associated with the application and treatment of fluids when dealt with by the service provider, so the improvement of the assurance of their quality is in the Agency's eyes more safety relevant.

The Agency observes that among the Member States that have responded Austria prefers option 2, Switzerland option 3 and the UK option 1. So there is a divergence of views among NAAs that mirrors their tradition in requiring licensing or not.

comment

102 comment by: *Ken Mutton (CityJet)*

CityJet feel that Option 3 - 'Regulatory Approval of service Providers'

should be the preferred option. Without a definitive regulation the standard of the de-icing service provided for such a safety critical task could become diluted. With the procedures open to interpretation by different operators and service providers. Regulation of the service providers should also contain some requirement for the level and standard of training required by personnel performing the de-icing operation and post de-icing inspections.

response

Partially accepted

CityJet prefers also option 3 and wants to see definitive regulation of the standard of the de-icing service to be provided as well as a setting of the level and standard of the training required by personnel performing the de-icing and post de-icing inspections.

The Agency notes that all (regional) airlines support option 3 and recognizes the call for action but refers to responses given to comments 3, 10 and 24 where the limitations are outlined. The Agency also would see benefits in direct certification requirements on de-icing companies.

comment

107 comment by: *European Cockpit Association*

14.3 Recommend option 3 because safety improvement of option 2 is not assured

response

Partially accepted

European Cockpit Association prefers option 3 to get a safety improvement.

The Agency notes the support for option 3 but refers to responses given to comments 3, 10 and 24 where the limitations are outlined. The Agency also would see benefits in direct certification requirements on de-icing companies.

comment

118 comment by: *UK CAA*

14.1 line #4
Fuel providers are not licensed by CAA in UK
Delete "…for example fuel provisioning"
Justification:
To ensure factual correctness.

response

Noted

comment *119* comment by: *UK CAA*

14.3 line #3
Attachment reference incorrect
Delete "…attachment 1" and add "attachment 6".
Justification:
Factual error

response *Noted*

A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 15. Aerodromes p. 11

comment *25* comment by: *Flybe*

AERODROMES

Para15.1

Correct, industry is asking for regulatory assistance in obtaining the fluid best suited to the Aircraft type and conditions.

Para 15.2.1

Option 2

States that some mechanism is required to ensure a range of fluids are available

Para 15.3

Envisaged Option is Option 2 BUT this is considered a LONG TERM ACTION,

Why?

response *Partially accepted*

The Agency notes that this reaction underscores the (regional) airlines interest in the matter, who prefer option 2 (some mechanism is required to ensure that the range of de-icing and anti-icing fluids are made available at all appropriate locations).

This option is long term due to the present lack of jurisdiction in the area of aerodromes and the limitations outlined under the responses given to comments 3, 10 and 24 where the limitations are outlined. The Agency also would see benefits in direct certification requirements on de-icing companies.

comment *32* comment by: *Airbus*

Airbus strongly urges EASA to mandate the availability of un-thickened (Type I) fluids at airports, in addition to the other thickened Type II/III/IV fluids

(weather conditions and required holdover time determine what type of fluid needs to be used)

Justification:

There is overwhelming agreement within the de-icing industry that the use of Type I fluids, either in a one step method (de-ice) or as part of a two step process (de-ice Type I, then anti-ice type II/III or IV), significantly reduces the occurrence of residue formation and problems. The primary use of Type I tends to wash off old residue, particularly because it should normally be applied hot when used as a de-iced fluid.

Conclusion for aerodromes: Airbus recommends option 2.

response *Partially accepted*

The Agency agrees with the information provided by Airbus, but must remind that for simply mandating all airports to stock and make available type I fluids it firstly lacks at present the legal basis; secondly such an action would not take account of the economic cost of the stocking of these fluids and thirdly is not equally relevant to all aerodromes/airports due to geography. The Agency would have to find a solution for the practical difficulties for the criteria for fluid availability at aerodromes (e.g. how to define the fluids to be made available within the commercial and geographic environment).

comment *53* comment by: *European Regions Airline Association*

Paragraph 15.1 states "Any action here can only be taken when the EASA is competent for the safety regulation of aerodromes.

Safety Recommendations 08/06 and 07/06, supported by the views held at the above mentioned ERA Workshop, considered that some mechanism was required to ensure that the range of de-icing and anti-icing fluids is made available at all appropriate locations."
Further to my comments in respect of paragraph 14.2, ERA are concerned that, if nothing can be done towards regulating the aerodromes to ensure that all required fluids are available to support operators of varied fleet types until it falls within EASA's competence, this is still some years away.

As was stated in our general comment to the A-NPA as a whole, Europe experienced one mild winter last year but this was an exception. our operators expect regulatory action to be undertaken on these issues before an aircraft and lives are lost. We cannot accept that such action is delayed any further.

response *Accepted*

European Regions Airline Association (ERAA) prefers option 3 and would like to bring the service providers and the aerodromes into the regulatory realm of EASA.

The Agency notes that all (regional) airlines support option 3 and recognizes the call for action but refers to responses given to comments 3, 10 and 24 where the limitations are outlined. The Agency also would see benefits in direct certification requirements on de-icing companies.

In addition in accordance with the core feedback from respondents, the Agency is also envisaging other medium and long term actions in coordination with FAA and TCCA as appropriate:

- Continue to take note of activities and progress made by the relevant SAE Committee and sub-groups on this subject and provide input as necessary (long term).
- Make proposals to the European Commission for studies to evaluate the feasibility of introducing in CS-23 and CS-25 a criterion for establishing sensitivity to fluid residues (long-term).
- Investigate and recommend the means by which Aviation Authorities of Member States manage matters in regard to the certification of service providers, availability of fluids at aerodromes, etc (mid-term).
- Make, as far as possible, provisions in the implementing rules on the safety of aerodromes with a view to make the operations of de-ice/anti-icing service providers safer and ensure the availability of fluids (mid-term).
- Consider input from stakeholders regarding amendments to the operational rules on de-icing/anti-icing, during the impending NPA consultation process of the implementing rules for air operations to Basic Regulation 216/2008 (medium-term).
- Plan to introduce into the rulemaking inventory a task to extent the Agency's remit to fluids and materials in addition to parts and appliances. Such a task would be preceded by an A-NPA to explain and consult on the concept (long-term).

comment *59* comment by: *AEA*

AEA Comment 2

AFFECTED PARAGRAPH

A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 15. Aerodromes

15.2.1 – Aerodromes

COMMENT

15.2.1 -Where a single de-icing service supplier is in place at any aerodrome, the supplier should have to consider the requirements of all operators with regards to service requirements including available fluid types. The supplier should accept and require legal contracts from all airlines operating to that aerodrome during the winter season. Aerodrome operators should not allow a 'monopoly' de-icing service supplier to operate at the aerodrome without meeting these conditions. This could be the basis for an EASA rule applicable to aerodrome operators.

Airlines, particularly smaller operators, often have insufficient influence to ensure that a service provider meets their individual de-icing requirements, particularly at aerodromes where only one supplier is available. The provision of type I fluids is unlikely to be achieved where larger operators, with larger aircraft types, have no particular requirement for it.

Airport suppliers in 'monopoly' situations will often refuse to sign contracts, so that their responsibility is limited, and they have no legal requirement to provide any particular type or standard of service. Equally, some airlines make

no particular attempt to put specific de-icing contracts in place.

Each party should have a clear understanding of the service provided, and where necessary, de-icing suppliers should have to provide a clear justification where they are unable to meet the stated requirements of their contracted customers. Airlines operating to aerodromes in 'cold weather' locations should be required by the aerodrome operator (and EASA) to have a suitable de-icing contract in place.

Where two or more companies offer a de-icing service, financial considerations should help to ensure that airline customer's requirements are met, providing that they were clearly detailed and considered during the contract award process.

response *Accepted*

The Agency believes the comments by AEA are very valuable and will be analysed further. Particularly in the light of cases where the de-icing facilities having been declared part of central infrastructure and therefore their installation and up-keeping (fixed cost) is being paid for by all users equally through the airport charges, the operators with aircraft requiring fluids other than the standard should also have their needs met. However, the economic feasibility of special de-icing needs, for type 1, should be proportional. It may be that ad hoc solutions provided for by the aerodromes and service providers need ultimately to be accepted.

comment *103* comment by: *Ken Mutton (CityJet)*

CityJet concur with the selection of option 2, that a full range of de-icing fluids should be made available at all appropriate locations, but that this should be a short to medium term action.

response *Partially accepted*

The Agency notes that this reaction underscores the (regional) airlines interest in the matter, who prefer option 2 (some mechanism is required to ensure that the range of de-icing and anti-icing fluids are made available at all appropriate locations).

This option is long term due to the present lack of jurisdiction in the area of aerodromes and the limitations outlined under the responses given to comments 3, 10 and 24 where the limitations are outlined. The Agency also would see benefits in direct certification requirements on de-icing companies.

comment *108* comment by: *European Cockpit Association*

15.3 Agree with RIA recommend for option 2

Option 1 could be acceptable if the tight control of training / guidance options above are implemented.

Issues of rehydration and fluid use would have been identified and addressed.

response *Partially accepted*

The European pilots agree with the Agency that regulatory action addressed to aerodromes where fluid use and provision is concerned because this would

result in the best safety improvement. However, the Agency believes that the research into re-hydration ought to be driven by the industry bodies.

comment *120* comment by: *UK CAA*

While this is clearly a long-term action, it is likely to be the most effective. The provision of deicing fluids at airports in addition to anti-icing fluids must be accompanied by the provision of sufficient deicing equipment to enable operators to deice shortly before departure, so that they don't need to anti-ice.

response *Not accepted*

The UK CAA considers this issue to be best solved over the long term. The aim should be to phase out the need for anti-icing fluids by providing sufficient de-icing equipment so that de-icing can take place shortly before departure and there being no need for anti-icing. Furthermore, the UK CAA believes that no regulatory burden should be placed on the aerodrome operators to provide all types of fluids as the economic and environmental burden would outweigh the safety gain. When looking at the issue the Agency is to consider cases in which the aerodrome is not engaged in de-icing and even more than one service provider is active and has a commercial relationship with the airlines.

The Agency is aware of the complexity of the issue to provide the most efficient de-icing fluid to all operators at the locations where needed under the condition of meeting environmental restrictions. That is why it may have to be considered to strengthen the position of operator of small aircraft vis-à-vis the service provider.

The Agency considers the UK CAA's comments, but also needs to highlight that there are monopoly situations at many European aerodromes regarding the de-icing service, where as a result, the market cannot solve the problem and the smaller operators may find themselves in a situation where their specific de-icing needs are not adequately met.

comment *122* comment by: *UK CAA*

15.2.1
No regulatory burden should be applied to aerodrome operators to provide all types of fluids. The economic impact and potential environmental impact could be excessive compared to the safety improvements.
Option 2 must take into account the fact that there may be several service providers supplying de-icing fluid on an aerodrome, and they may not be the aerodrome operator.

Justification:
The aerodrome operators may not be the service provider. There may be several providers and the supply to operators of de-icing fluid is a commercial relationship.

response *Not accepted*

The UK CAA considers this issue to be best solved over the long term. The aim should be to phase out the need for anti-icing fluids by providing sufficient de-icing equipment so that de-icing can take place shortly before departure and there being no need for anti-icing. Furthermore, the UK CAA believes that no regulatory burden should be placed on the aerodrome operators to provide all types of fluids as the economic and environmental burden would outweigh the safety gain. When looking at the issue the Agency is to consider cases in which

the aerodrome is not engaged in de-icing and even more than one service provider is active and has a commercial relationship with the airlines.

The Agency is aware of the complexity of the issue to provide the most efficient de-icing fluid to all operators at the locations where needed under the condition of meeting environmental restrictions. That is why it may have to be considered to strengthen the position of operator of small aircraft vis-à-vis the service provider.

The Agency considers the UK CAA's comments, but also needs to highlight that there are monopoly situations at many European aerodromes regarding the de-icing service, where as a result, the market cannot solve the problem and the smaller operators may find themselves in a situation where their specific de-icing needs are not adequately met.

A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 16. Summary of possible options envisaged by EASA p. 12

comment *26* comment by: *Flybe*

Para 16 page 12 sums up the proposed action

See summary table below

AREA	OPTIONS envisaged	AFFECT	EFFECTIVNESS
Design	Mix 2,3+5	2+3 are already in place, 5 may assist but is long term	Status Quo
Operations	1	Do Nothing	Status Quo
Maintenance	2	Amend Parts 145+66. No direct affect on the greater No. of deice operations	Could be Negative
Service Providers	2	Industry Self Monitoring	Status Quo
Aerodromes	2	Needs increase in fluid type available, Long Term >3yrs	Status Quo

NET EFFECT NO CHANGE

However a lot of time and money has gone into achieving NO increase in Flight Safety

response *Noted*

The Agency takes note of the recommendations and references. The Agency takes note of the discontent of Flybe. However, no response to the specific question was given.

comment *28* comment by: *Swiss Federal Office of Civil Aviation (FOCA)*

Please find below the answers of Swiss FOCA to the 4 questions:
Question 1: appropriateness of the envisaged options:

The views of stakeholders are sought on the action plan, with particular emphasis on:

a) Identification of any other course of action

b) Options not identified

c) Necessary coordination with other bodies when the action is not within the remit of the Agency

Q 1a) Identification of any other course of action

It is highly assumed that the properties specified for aircraft-deicing fluids may be changed (degraded) by interference with surface-deicing products. This topic is not investigated (regulated) properly so far.

Furthermore the aspects of surface-deicing at airports are not part of this A-NPA. The influence of such products on aircraft materials (e.g. carbon brakes) is reported already.

Therefore FOCA does propose to incorporate these subjects and all related subtasks into the review-activities within EASA.

Q 1b) Options not identified

no additional comment

Q 1c) Necessary coordination with other bodies when the action is not within the remit of the Agency

FOCA highly recommends active participation / observation by EASA-representatives within respective working-groups and standardization bodies (e.g. AEA, SAE G-12, etc.). Different recommendations and standards are provided by such bodies; nevertheless such documents are not binding. This may create some uncertainty for service providers and operators. Therefore a clearly defined role of the Agency is necessary, and binding standards (respectively reference to already existing norms) have to be defined by EASA.

In addition close cooperation with other regulatory bodies (e.g. FAA) in the field of aircraft ground de-icing as well as airport surface de-icing appears necessary in regard to achieve common understanding, harmonized requirements and regulations, as well as highest safety improvements.

Question 2: regulatory impact assessment

In addition stakeholders are invited to comment of the information included into the regulatory impact assessment and to provide any further information.

Design / Continued Airworthiness related to design

In regard to achieve highest impact on safety improvement option 6 of the possible actions and timescales on "Design / Continued Airworthiness" has to be taken into consideration additionally to options 2, 3, and 5 – even so the economic impact may be excessively high.

FOCA recommends requiring the mandatory performance of a risk assessment by Type Certification Holders in regard to the design criteria of existing (approved) aircraft in relation to the consequences of using different de-/anti-icing fluids and methods in correlation to the aero-dynamical behavior of the aircraft and to critical structural zones (aircraft surfaces, control surfaces, etc.) concerning the re-hydration/freezing of such fluids. Based on the outcome of such evaluation potentially remedial activities have to be taken into consideration.

Today's and near future aircraft operation is based on existing aircraft types and design, therefore implementation of option 5 exclusively (without option 6) does not have any effect on safety improvement for short- and mid-term period.

Operations

Basically FOCA concurs with the evaluation of the two options, also in regard as the respective subject is covered by ACJ OPS 1.345 satisfactorily.

Nevertheless FOCA is also in favor to support Option 2.

Mainly smaller operators – predominantly operating aircraft without powered flight controls – would benefit by improved regulatory standards and requirements. By this a real contribution in regard to improved flight safety may result.

Maintenance

FOCA does support the envisaged options based on the experiences within Switzerland.

Furthermore FOCA does recommend co-operating closely with the respective operators in developing the final rules and requirements.

Service Providers

FOCA does evaluate Option 2 as most probably too weak as to have a remarkable impact on flight safety improvements. At least a common training standard – acceptable to the authorities – for de-icing staff as well as for its trainers has to be established.

Much more FOCA is in favor of Option 3.

It is clearly understood that the national authority would have the power to force improved awareness and performance of de-icing services through the airport operators and their obligations.

Nevertheless a harmonized understanding and based thereon a common regulation would best support the activities in regard to improve flight safety. Therefore FOCA supports establishment of standards and requirements in regard to the provision of de-icing services.

Through such approach the common philosophy (necessary tools & equipment, adequately trained resources, and required documentation) can established also within this area of controlled and safe flight operations.

Aerodromes

no additional comment (ref. answer to question 4)

Question 3: Service providers:

Specific comments are requested on:

a) The area to be licensed / regulated, for example the scope of service provided. Any scope must be related to the equipment available and staff competency, hence is linked to a demonstrated capability and therefore may need to be aircraft type specific;

b) The training requirements (fluid types, properties, storage and application)

Q 3a) The area to be licensed / regulated

The area to be licensed / regulated should be related to the aircraft types, to the de-icing products (hot water, normal de-icing fluid, thickened de-icing fluid), to the processes (one step, multiple steps), and to the equipment / procedures in use (de-icing at gate, central de-icing, vehicles, fix installation).

Staff and training personal have to be licensed by the Authority to ensure a proper level of safety.

Competencies (licensing / regulation) for de-icing should be built up under the aerodromes requirements and responsibilities with possibility for delegation to adequately regulated (and controlled) service provider(s).

Q 3b) The training requirements

Based on the statement given under Q 3a) the training has – beside basic knowledge on processes, procedures, and products (including types, properties, storage, and application) – to be linked to the capabilities at the specific aerodrome. This includes, but is not limited to equipment, aircraft types, local environmental conditions.

Question 4: Aerodromes

Specific comments are requested on:

a) the minimum range of products to be available (fluid types, properties, storage and application)

b) Should this be a new regulation or which regulation(s) should be amended to best address this.

Q 4a) The minimum range of products to be available

	The "range" of de-icing products offered at each location should not be unlimited. The service provider (for and on behalf of the aerodrome operator) has to assure that the products available on the respective aerodrome will fulfill necessary requirements for aircraft de-icing under local environmental conditions and flight operations (aircraft types) provided at this location. Therefore the training requirements (ref. Q 3B) have to be required to include the local conditions / situation. Q 4b) New regulation, or which regulation(s) should be amended Based on the very specific field of operational conditions it is recommended to provide new and specific regulation on this subject. Nevertheless existing basic regulations (for aerodromes) should be referred as base for new requirements developed.
response	*Noted* Question 1. appropriateness of the envisaged options: The Agency wants to point out that the issue of runway/surface de-icing is still outside the scope of this A-NPA. Nevertheless the Agency has issued a Safety Information Notice (SIN 2008-19) regarding this issue. Coordination with the FAA and TC is planned. However, these agencies have clearer jurisdiction. Regarding standardization of de-anti-icing fluids, the Agency will not be able to replace the work done by SAE but maybe able to one day elevate their work to the level of AMC and/or guidance material (e.g. where procedures are concerned). If and how the Agency could/should certify fluids warrants further investigation. Question 2. regulatory impact assessment: • Design/ Continuing airworthiness related to design: noted • Maintenance: noted • Operations: The Agency had proposed option 1 (do nothing) over option 2 (changes to requirements/guidance material on operations) as the provisions contained in EU-OPS and JAR-OPS 1 are in any case being presently transposed to become implementing rules for the Basic Regulation. In the process of the development of implementing rules (IRs) and Acceptable Means of Compliance (AMCs) for operations stakeholders will soon, be consulted on the relevant JAR-OPS 1 transposition, namely JAR-OPS 1.345 and 1.346 and associated AMCs. If stakeholders consider all or some elements of option 2 necessary, they are invited to respond accordingly to the forthcoming NPA on Air Operations, which is currently scheduled to be published in September 2008. Any comments received could then be considered for inclusion with the new implementing rules which may enter into force as early as end of 2009. • Service providers: The Agency notes the discontent of FOCA with the chosen option 2 and the preference for option 3. The Agency would like to develop a common regulatory approach but the limitations mentioned throughout the responses apply. • Aerodromes: n.a Question 3a. and 3b. on service providers:

The Agency takes note of the strong regulatory approach of Switzerland and the detailed comments and recommendation regarding scope of licensing. Given the fact that most Member States do not engage in such certification/ licensing of de-icing/anti-icing service providers yet, it may be difficult to achieve this depth.

Question 4a. and 4b. on aerodromes:
The Agency agrees that all types of fluids should be made available according to the local needs in terms of weather conditions, hold over time, infrastructure and fleet mix. One possibility could be through establishing an appropriate requirement in the operational rules (see answer to operations, question 2, on the transposition of JAR-OPS into Community law).

comment *33* comment by: *Airbus*

Airbus understands that behind the A-NPA, EASA is proposing to consider the use of regulations to solve the problems of frozen re-hydrated fluid residues and is requesting feedback from the industry about how to proceed. To summarize our comments on the various options proposed, Airbus's opinion is as follows :

1) The means to address the fluid residue problem should recognise the disparity between the problems that have been experienced on different aircraft. Some aircraft have experienced many serious incidents due to residues, others have experienced very few or none (this is the case for Airbus Fly By Wire aircraft fitted with powered Flight controls). In a general manner, the perimeter of application of this A-NPA (which type of aircraft) needs to be clarified.

2) Airbus strongly urges EASA to regulate the icing Service Providers, to control the fluid as it is being applied

3) Airbus strongly urges EASA to regulate/harmonize the Airlines requirements for de-icing provided to the Service Providers. This may mean referring to a specific source e.g. AEA (Association of European Airlines) or SAE De-Icing procedures and training recommendations.

4) Airbus strongly urges EASA to mandate the availability of un-thickened (Type I) fluids at airports, in addition to the other thickened Type II/III/IV fluids (weather conditions and required holdover time determine what type of fluid needs to be used)

5) Consequently the proposed actions that Airbus considers as the most appropriate to solve the issue are as follows:

Design/continued airworthiness : combination of options 2 and 3

Operations : option 2

Maintenance : option 2

Service Providers : option 2 or preferably 3

Aerodromes : option 2

response *Accepted*

Airbus did not answer to the questions specifically as they were posed. Several points were made to which the Agency has a few comment to make:

To 1:

The Agency is of the opinion that the scope of aeroplanes to which this A-NPA and ensuing actions should apply is wider than just aeroplanes with non-powered flight controls. Please see the stated Agency policy suggestions in the body of the CRD document.

To 2:

Regulating service providers is currently outside the scope of the Agency. However, the provisions contained in EU-OPS and JAR-OPS 1 are in any case being presently transposed to become implementing rules for the Basic Regulation. In the process of the development of implementing rules (IRs) and Acceptable Means of Compliance (AMCs) for operations stakeholders will soon, be consulted on the relevant JAR-OPS 1 transposition, namely JAR-OPS 1.345 and 1.346 and associated AMCs. If stakeholders consider all or some elements of option 2 necessary, they are invited to respond accordingly to the forthcoming NPA on Air Operations, which is currently scheduled to be published in September 2008. Any comments received could then be considered for inclusion with the new implementing rules which may enter into force as early as end of 2009.

To 3:
Please consider response to point 2 and asks Airbus to participate in the forthcoming NPA on the Air Operations Implementing Rules.

To 4:
Airbus Urges the Agency to mandate the availability of un-thickened (Type I) fluids at airports, in addition to the other thickened Type II/III/IV fluids. However, safety regulation of aerodromes is currently outside the scope of the Agency. Please refer to the general Agency policy statement in the main body of this CRD.

To 5:
Airbus's preferences are being noted.

comment *48* comment by: *DGAC France*

DGAC France agrees that use of de-icing / anti-icing fluids is of a particular complexity as it mixes responsibilities among several actors: the aircraft operator, the TC holder, the maintenance organisation, the fluid provider, the service provider, the aerodrome operator.

Please find here after our position concerning the different issued addressed by this A-NPA.

a) design / continued airworthiness related to design:

DGAC France agrees that TC Holders shall describe practices and precautions to use de-icing products in respect to the specificities of their designed aircraft; It shall be part of the continued airworthiness information (21.A.61) to be provided by the TC Holder and amended according to service experience. (§11.1, option2).

DGAC France believes that the products shall follow industry standard, eventually improved by international committees. There is currently competition between products manufacturers and they often propose new fluids. We therefore opt for §11.1, option3.

We do not have an objection against option 4, although we believe there would be some challenges to certification considering the various configurations between fluids, type of aircraft, way of applying the product, the condition of the product (temperature, after short or long storage, …). Some studies might be necessary to identify representative flight conditions to qualify the efficiency of those fluids, how long they stay on the surfaces, their aerodynamic impact, …

b) Operations:

DGAC France considers that all the material developed by the JAA and recently introduced in JAR-OPS should be transferred in the EASA implementing rules and associated AMC/GM under development by EASA.

c) maintenance:

DGAC France agrees with the principle to introduce in the maintenance plan adequate regulation to address de-icing or anti-icing fluids and notably introduction of periodic inspection and removal of residues.

Although we understand that no detailed comment is awaited at this A-NPA stage, we would like to provide you with the following comments on appendix 4 and 6, in advance to a formal NPA:

- the change to AMC MA.201(h) adds a sentence dealing with cleaning, refuelling and states the removal of a panel or cover is to be done within Part 145. This is very confusing, as it seems to imply that inspection for residues always follows de-icing / anti-icing service, when inspection and removal of fluids residues are done during a scheduled line maintenance operation, after several flights and anti-icing operations; so it makes sense that a qualified part 145 organisation performs those operations. But the anti icing service is out of the maintenance scope as already written and is performed at a different time before take off.

- We understand that the authority must understand the impact between operations and airworthiness , but the proposed sentence within AMC M.B.102 (c) item 1.2.(f) seems a bit too vague and may imply "out of this context" unintended constraints later on. This comment is also valid for the change to AMC 145.B.10 (3).

d) Service providers:

DGAC France considers that approval of de-icing service providers cannot be disconnected from the general discussion on all services providers and, at this time, concurs with the selection of option 2 for anti-icing service providers.

e) Aerodromes:

Option 2 does not seem adequate to DGAC France for the following:

- An aircraft operator does not need to have all kind of anti-icing fluids

	on any airport he flies to. - An efficient type of fluid in one airport in Italy may not be the same one to consider for an airport in Norway. - Some local specification on environment protection may limit the use of some types of fluids. However instead of option 1, doing nothing, we consider that there may be a need to define how aircraft operators could be informed on deicing / anti-icing services and fluids available at each airport. maintenance operation. We recognise that some of the above issues may be, for some time, out of the scope of the Agency and we would be ready to support the Agency in bringing it to the agenda of the European Commercial Aviation Safety Team, to see if ECAST could coordinate appropriate actions.
response	*Noted* DGAC did not answer the questions in the proposed order but made a number of points to which the Agency has the following responses: <u>a) Design/ continued airworthiness related to design:</u> Noted. <u>b.) Operations</u> The Agency agrees and confirms that all provisions in JAR-OPS regarding de-icing/anti-icing are being transferred into the new Community framework. Stakeholders will soon be consulted on the forthcoming NPA on Air Operations, which is currently scheduled to be published in September 2008. Any comments received could then be considered for inclusion with the new implementing rules which may enter into force as early as end of 2009. <u>c.) Maintenance:</u> AMC M.B.102 (c) intentionally remains generic because the proposed amendment does not want to address specifically the issue of de-icing/anti-icing. <u>d.) Service providers:</u> The Agency agrees with DGAC about the complexity of the issue and agrees that there are also other service providers whose activities pertain to the safe operation of aircraft. However, they are at present outside the scope. Please see the main body of this CRD for details on the proposed Agency policy on this issue. <u>e.) Aerodromes:</u> The Agency agrees that the availability of types of fluids should be made available according to the local needs in terms of weather conditions, hold over time, infrastructure and fleet mix. One possibility could be to mandate the operators to ensure that the fluids are available at the locations flown to. However, it seems this cannot be entirely left to the commercial relationship between the operator and the service provider or airport as the case may be, due to a possible lack of responsiveness of the latter. The Agency understands, that any rule would have to take account of the reality of the required addressee, i.e. aerodrome or service provider.

comment	*61* comment by: *AEA* **AEA Comment 4** AFFECTED PARAGRAPH A. EXPLANATORY NOTE - V. Possible EASA actions and timescales - 16. Summary of possible options envisaged by EASA. Question 1 to Question 4 COMMENTS Q1. A potentially serious situation currently exists in regard to A/C with un-powered flying controls and the envisaged options are considered both appropriate and of an urgent nature at this time. Would recommend the Agency continue to co-ordinate these issues with AEA, as at present. Q2. Appears to be quite comprehensive. Q3. Current audits, such as those carried out by the IATA DAQCP, are effectively designed to ensure the necessary infrastructure is in place at Stations to allow a safe operation. For any licensing/regulating of service providers to be meaningful it is suggested that 'live' de-/anti-icing operations would need to be audited. The scope of the services provided is currently defined in the Handling Agreement. Training requirements are currently published in both the AEA Recommendations for the De-Icing/Anti-Icing of Aircraft on the Ground (22nd Edition) and AEA Training Recommendations and Background Information for De-Icing/Anti-Icing of Aircraft on the Ground (4th Edition). Q4. It is recommended that an approved Type I and an approved Type II or Type IV fluid should be made available at the 'cold weather' Stations where aircraft with un-powered flying control operate. The Type I fluid would need to be diluted (see AEA Recommendations for appropriate dilutions) and heated for de-icing purposes, i.e. for removing frozen deposits. The Type II, III or Type IV fluid would then be applied to the previously de-iced surfaces, as an anti-icing treatment but only when additional holdover time was required. Details of the fluid types, their properties, storage and application may also be found in the AEA Recommendations for the De-Icing/Anti-Icing of Aircraft on the Ground (22nd Edition). It's unclear at this time how the requirement to provide two products could be enforced. One possibility is that the Airport Authorities include it as a stipulation in the licensing agreement which they have with service providers.
response	*Noted* Question 1: The Agency notes the concern and is attending relevant AEA working group on the issue. Question 2: n.a. Question 3: The Agency takes note of the recommendations and references. Question 4: The Agency takes note of the recommendations and references.

comment	*74* comment by: *Cessna Aircraft Company* Cessna Aircraft Company In reply refer to E390-07-3549 Cessna's response to Question 1; Thickened ground de-icing/anti-icing fluids were implemented in the 1980's. Reports of flight control incidents due to fluid residues surfaced in the late 1990's. An additional option would be to consider having the fluid manufacturers revert to the ground de-icing fluid formulations which were used prior to the first reported residue incidents. The implications on holdover times and other recent improvements to the fluids should be carefully considered prior to selecting this option. Cessna has no comment on questions 2-4.
response	*Not accepted* The consequences of doing what the commentator is proposing are likely to lead to reduced hold-over times. This may have a negative impact on safety in the present context of increased productivity.

comment	*79* comment by: *Walter Gessky* **Question 1 (page 12)** Identification of any other course of action: a. Add the following: TC holder has to verify by calculation and tests for each type of de-icing/anti-icing fluids recommended to be used the impact of the application of de-icing/anti-icing fluids and any residues on the aerodynamic (stall speed, drag etc) of the aircraft.. The TC holder has to provide recommendation in the maintenance manual or operating manual • with regard to the industry standards/specifications for the fluid allowed to be used (similar to fuel or oil specification), and • application of fluids, impact of residues and removal of such contamination. Justification: When the TC holder recommends practices for the application of de-icing/anti-icing fluids than he should have investigated about the impact with regard to lift and drag of the type of fluid used , provide information which type of fluid can be used similar to the recommendation for lubricants, oil fuel etc. The type of fluids to be used and the impact of the characteristics of fluids should have been evaluated by calculation and tests, when the fluid to be used is addressed in the Operating Manual. The fluids have to be defined by an adequate standard and the provider of the fluids has to grant minimum delivery standards.

response	*Noted* The proposal made by the Commentator will be addressed during the long term research actions proposed by the Agency action plan.

comment	*80* comment by: *Walter Gessky* **Question 2: regulatory impact assessment (page 12)** See comments to the RIA.
response	*Noted* No comment needed here.

comment	*87* comment by: *Walter Gessky* **Question 3: Service providers (page 12)** In the development of industry standards and industry monitoring programme the fluid providers have to be involved.
response	*Accepted* The Agency knows that fluid manufacturers are involved in the SAE working groups.

comment	*88* comment by: *Walter Gessky* **Question 4: Aerodromes (page 12)** Specific comments are requested on: • the minimum range of products to be available (fluid types, properties, storage and application): We can not mandate in a rule that the airport has to ensure that the range of de-icing and anti-icing is available. In a free market the operators have to evaluate before they start operation to a specific airport that the required support is available. This should be part of the operator's quality system that fluids are available at all appropriate locations. • Should this be a new regulation or which regulation(s) should be amended to best address this? It could be regulated that the aerodromes have to provide the proper support (handling, de-icing, anti-icing etc. If the aerodrome is not able to provide the support, than he has to accept adequate service providers. If an adequate service is not offered, than the aerodrome has to allow the operator to organize the required service on its own. EC rules EU Directive 96/97/EYincludes aerodrome service providers requirements. It should be evaluated if these rules are sufficient to regulate all the aspects of de-icing, anti-icing.
response	*Partially accepted* The Agency agrees that the availability of types of fluids should be made

available according to the local needs in terms of weather conditions, hold over time, infrastructure and fleet mix. One possibility could be to mandate the operators to ensure that the fluids are available at the locations flown to. However, it seems this cannot be entirely left to the commercial relationship between the operator and the service provider or airport, as the case may be, due to a possible lack of responsiveness of the service provider or airport to the operators wishes. Often these actors are in monopoly situations toward the operators. The Agency understands, that any rule would have to take account of the reality of the required addressee, i.e. aerodrome or service provider.

The Agency is not convinced, that this issue can be resolved solely by looking at training requirements. The Agency is also not convinced that the Ground-handling directive can be used for this purpose as it is about market access not safety and it concerns itself only with airports above 2 million passenger movements or 50,000 t of freight per scheduling period.

comment *121* comment by: *UK CAA*

15.3 line #3
Attachment reference incorrect
Delete "…attachment 1" and add "attachment 7".
Justification:
Factual error.

response *Accepted*

comment *123* comment by: *UK CAA*

It is not known if runway contamination by re-hydrated fluids can be hazardous. The runoff from an "overdosed" aircraft is shed on acceleration, usually in the touchdown zone. At a later time, when wetted there could be a significant loss of friction due to reconstitution of the fluid residue. There is only one minor reference to this phenomenon in the NPA

Proposed text:
16.1 The Agency envisages research into fluid residue build up on runways arising from excess type 4 fluid run-off having the potential to reduce runway friction levels when reconstituted through wetting.

Justification:
For completeness - if research is to be conducted then this issue should be included.

response *Accepted*

The Agency is presently coordinating with other relevant actors such as UK CAA, DGAC France, ICAO and the Flight Safety Foundation to define possible research into aircraft breaking action on contaminated runways. This issue could be included in that research, as well.

comment *124* comment by: *UK CAA*

Para 16: Response to Question 4 on page 12
A) The UK CAA does not believe that it is for aerodromes to specify the

	minimum range of de-icing products. This is a matter for the a/c operator and their service provider. B) As in A) above being a commercial issue there should be no regulatory burden on the aerodrome operator. The fluids themselves may be required to meet certifiable international standards and the personnel responsible for the application of those fluids may be required to meet an appropriate level of competence. Justification: In the UK aerodrome operators may not be the service provider. There may be several providers and the supply to operators of de-icing fluid is a commercial relationship.
response	*Partially accepted* The Agency agrees that the availability of types of fluids should be made available according to the local needs in terms of weather conditions, hold over time, infrastructure and fleet mix. One possibility could be to mandate the operators to ensure that the fluids are available at the locations flown to. However, it seems this cannot be entirely left to the commercial relationship between the operator and the service provider or airport, as the case may be, due to a possible lack of responsiveness of the service provider or airport to the operators wishes. Often these actors are in monopoly situations toward the operators. The Agency understands, that any rule would have to take account of the reality of the required addressee, i.e. aerodrome or service provider.

B. ATTACHMENTS p. 13

comment	*97* comment by: *Malmo Aviation* As an operator in Northern Europe of aircrafts with "non-servo-powered" flight controls (Avro RJ & BAe 146), this is a NPA that concerns/will involve us a lot. It is the most complex NPA that I have read. Many choices to consider and with references to complex in depths reading etc. <u>Reflections & comments to the best of my/our ability;</u> I feel it is difficult to get a good overview of all the options and their impacts…….. One of the most important things is to make sure that all Anti/de-ice service providers in Europe have the ability to supply both type 1 and type 2 fluids. I recommend that EASA meet and consults with a Steering group expeditiously before final decisions are made. The steering group in mind is the remains of the JAA De/anti-icing steering group or similar.
response	*Accepted* The rulemaking process of the Agency insures that ample consultation takes place and comments are taken into consideration before taking final rulemaking action. In addition, the Agency is actively cooperating with industry working groups and authority bodies which are engaged in issues of de-icing/anti-icing,

including the SAE G12 Residue Working Group and expert groupings such as the former JAA de-icing/anti-icing steering group.

B. ATTACHMENTS - Attachment 1- Regulatory impact assessment for Design / Continued Airworthiness related to design p. 13-15

comment *4* comment by: *Chair of Residue Workgroup, SAE*

In the safety impact assessment, options 2, 4 and 6 have the maximum affect on flight safety, but options 2, 3 and 5 were chosen. Why is safety not the top priority?

Both 3ii and 3iii state that by pursuing Options 3 and 4, new fluids will be developed with new characteristics. This is misleading.

Some manufacturers whose fluids do not have an acceptable residue performance may develop new fluids with a better residue performance. It has to be remembered though that this has to be balanced with the holdover performance, environmental impact, cost, and ease of application.

response *Noted*

The selection of a preferred option takes into account all the impacts not only the safety impact.

The intention of option 4 was to mandate a formal process of qualification of fluids. This formal qualification of fluids will need the definition of criteria for doing so. It should not be excluded that this criteria require new fluid characteristics compared to today. However the definition of the criteria will take into account the elements mentioned by the commentator.

comment *45* comment by: *Juha Fieandt*

EASA should consider the option of having its own certification regulations (that could be in line with SAE with additions) for fluids. Currently only SAE in North America can set standards for fluids but why could there not be an European set of rules (as there are with airplane certifications for both FAA and EASA).

response *Not accepted*

Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes fluids are not within the present remit of the Agency.

comment *81* comment by: *Walter Gessky*

Regulatory Impact Assessment
a) Attachment 1 (page 13)

Option 2:

Change the following:

It may be considered appropriate to require Type Certificate Holders to review their current

information and investigate **about the impact of the application of de-icing/anti-icing fluids on the aerodynamic (stall speed, drag etc.) of the aircraft** and publish additional material to identify the recommended **de-icing/anti-icing** fluids and practices for the application of **this** de-icing/anti-icing fluids, the methods for identifying residues and the processes for removal of such contaminants, where this is not already available.

Justification:

When the TC holder recommends practices for the application of de-icing/anti-icing fluids than he should have investigated about the impact with regard to lift and drag of the type of fluid used , provide information which type of fluid can be used similar to the recommendation for lubricants, oil fuel etc.

The type of fluids to be used and the impact of the characteristics of fluids should have been evaluated by calculation and tests, when the fluid to be used is addressed in the Operating Manual.

The fluids have to be defined by an adequate standard and the provider of the fluids has to grant minimum delivery standards.

response

Noted

The RIA of this A-NPA will not be amended; nevertheless the comment will be taken into consideration at the stage of the Decision/Opinion if relevant.

The Agency is also of opinion that this option here proposed do not need to go to that level of details.

comment

82 comment by: *Walter Gessky*

Option 3 second sentence:

Add the following after (d):

(**e) minimum delivery standards for the fluid providers.**

Justification:

The fluid provider has an adequate quality system to declare that the delivered fluid complies with the industry standard.

The responsibility of the fluid manufacturer to deliver the correct fluid is not mentioned in the NPA. This should be similar to a material manufacturer.

response

Noted

The RIA of this A-NPA will not be amended; nevertheless the comment will be taken into consideration at the stage of the Decision/Opinion.

comment

98 comment by: *Malmo Aviation*

I agrees on Options 2,3&5 but would like to discuss advantages/disadvantages

on option 4.

response

Noted

Here are explained some difficulties about Option 4.

- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative.

comment

113 ❖ comment by: *UK CAA*

11.1, Option 5 and Attachment 1 paragraph 1
It is considered that **'Option 5'** should also be adopted either as a whole or in part within the CS documents especially for aircraft without powered flight controls.

Justification:
This would catch the many CS23 JET aircraft that are awaiting certification, nearly all of these aircraft do not have powered flight controls and may well suffer from this phenomenon in the future

response

Noted

The Agency acknowledges the commentator's support on Option 5. The Agency has indicated, in its A-NPA, Option 5 as potential means of long-term action but clarification in this matter is indicated in **response to comment 95, point 1.** Qualified by **response to comment 13, point 3.**

comment

126 comment by: *UK CAA*

Option 2 should be adopted with text changes as noted.
"It may be considered appropriate to require Type Certificate Holders, of aircraft known to be affected by incidents of control restrictions due to frozen re-hydrated de-ice fluid residue, to review their current information and investigate and publish additional material to identify the recommended practices for the application of de-icing/anti-icing fluids, the methods for identifying residues and the processes for removal of such contaminants, where this is not already available."
Justification:
'Option 2', as written, is a catch all and would unfairly discriminate against those aircraft whose flight controls are not affected by the effects of frozen re-hydrated de-ice fluid residue. Furthermore, NPA 2007-11, **'Option 2'**, does not take into account the effects of frozen re-hydrated de-ice fluid residue on new TC applicant aircraft, many of whom may be unaware of the phenomenon.

response

Noted

The RIA of this A-NPA will not be amended; nevertheless the comment will be taken into consideration of the stage of the Decision/Opinion if relevant.

In the first step, the Agency would send letters to TC Holders (for EU products) and to NAAs of the State of Design (for non EU products) informing them of the serious safety concern and requiring each type certificate holder of large

aeroplanes (as defined in CS-Definitions) and of commuter aeroplanes (as defined in CS-23) to review and amend as necessary, taking into account published information on fluids re-hydration:

- Their published instructions and procedures for the correct application of de-icing and anti-icing fluids onto their products, and
- Their maintenance instructions for the aircraft upon use of such fluids.

The purpose would be to include or improve instructions as to:

- What to look for (e.g. gel and dried residues),
- Where to look for anti-ice residue in the aircraft structure, and
- How to remove these residues effectively.

In addition the maintenance instructions should give guidelines for operators on how to determine the frequency of the necessary checks. Existing published information on fluid's re-hydration could be usefully taken into account when defining the M.A.302 maintenance programme. It is foreseen that the Agency will require that the review and necessary amendments should be available to operators prior to the 2008 winter operation for aeroplanes that are most susceptible to the phenomenon (usually those equipped with one or more non-powered flight controls) and prior to 2009 winter operations for the others. If TC holders consider their aeroplanes as being less sensitive or not affected, this should be justified.

When these instructions have been defined by TC holders, European operators would have to incorporate them into their maintenance programme in accordance with Part-MA.302 (f) and (g) and into their Operations Manual in accordance with EU-OPS Subpart P. To further support these actions the Agency will issue an NPA to suggest changes to Part-M in order to better address the consequences of de-icing and anti-icing fluids on continuing airworthiness.

These set of actions are aligned with option n°2 and as suggested by this comment.

comment *127* comment by: *UK CAA*

'Options 3 and 4' should be adopted. However it should be noted that the manufacture, storage, segregation and use may not be adequately controlled.

response *Noted*

For option 4, some drawbacks are encountered:

- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative.

comment 128 comment by: *UK CAA*

'Option 6' should not be mandated.
Justification:
The use of Certification Specifications to retrospectively compel TC holders to investigate all current aircraft for susceptibility to frozen re-hydrated de-ice residue control restrictions could produce an unnecessary burden on TC holders and operators. Some aircraft are not affected by this phenomenon at all. A better way to deal with specific aircraft issues would by use of Airworthiness Directives.

response *Noted*

In the first step, the Agency would send letters to TC Holders (for EU products) and to NAAs of the State of Design (for non EU products) informing them of the serious safety concern and requiring each type certificate holder of large aeroplanes (as defined in CS-Definitions) and of commuter aeroplanes (as defined in CS-23) to review and amend as necessary, taking into account published information on fluids re-hydration:

- Their published instructions and procedures for the correct application of de-icing and anti-icing fluids onto their products, and
- Their maintenance instructions for the aircraft upon use of such fluids.

The purpose would be to include or improve instructions as to:

- What to look for (e.g. gel and dried residues),
- Where to look for anti-ice residue in the aircraft structure, and
- How to remove these residues effectively.

In addition the maintenance instructions should give guidelines for operators on how to determine the frequency of the necessary checks. Existing published information on fluid's re-hydration could be usefully taken into account when defining the M.A.302 maintenance programme. It is foreseen that the Agency will require that the review and necessary amendments should be available to operators prior to the 2008 winter operation for aeroplanes that are most susceptible to the phenomenon (usually those equipped with one or more non-powered flight controls) and prior to 2009 winter operations for the others. If TC holders consider their aeroplanes as being less sensitive or not affected, this should be justified.

When these instructions have been defined by TC holders, European operators would have to incorporate them into their maintenance programme in accordance with Part-MA.302 (f) and (g) and into their Operations Manual in accordance with EU-OPS Subpart P. To further support these actions the Agency will issue an NPA to suggest changes to Part-M in order to better address the consequences of de-icing and anti-icing fluids on continuing airworthiness.

B. ATTACHMENTS - Attachment 2 - Regulatory Impact Assessment for Operations p. 16-17

comment 42 comment by: *Juha Fieandt*

The regulation of service providers and training requirements is one very important step towards uniformity and safe practices for de-icing. This should

be prioritized.

response

Partially accepted

The Agency wants to take appropriate action on the recommendations of the accident investigation boards. Certain limitations exists at this point, these are:

- As Commission proposal 390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013(*) at the latest. Until that time the Agency has no legal remit to impose on aerodromes to ensure that all services provided at their facilities are safe for aircraft operations(**). In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area.
- The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available within the commercial and geographic environment).
- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative.

Despite these limitations the Agency is planning to pursue the action plan as outlined in the explanatory memorandum of the CRD and in the short term act upon Type certificate holders to consistently provide the necessary information for operators to manage the residue problem.

(*) It is envisaged that on 1.1.2013 the extension of the Basic Regulation and all its Implementing Rules will be effective.

(**) Please see the relevant Commission proposal to amend the Basic Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25th June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

comment

83 comment by: *Walter Gessky*

Attachment 2 - Regulatory Impact Assessment for Operations (page 16)

Option 1 is supported,

OPS 1.345 regulates **Ice and other contaminants — ground procedures**

To control service providers is the responsibility of the operator's quality system

response

Noted

comment	*99* comment by: *Malmo Aviation* I feel it needs more than option 1 "do nothing" …….-if feasible…..
response	*Noted* The Agency had proposed option 1 (do nothing) over option 2 (changes to requirements/guidance material on operations) as the provisions contained in EU-OPS and JAR-OPS 1 are in any case being presently transposed to become implementing rules for the Basic Regulation. In the process of the development of implementing rules (IRs) and Acceptable Means of Compliance (AMCs) for operations stakeholders will soon, be consulted on the relevant JAR-OPS 1 transposition, namely JAR-OPS 1.345 and 1.346 and associated AMCs. If stakeholders consider all or some elements of option 2 necessary, they are invited to respond accordingly to the forthcoming NPA on Air Operations, which is currently scheduled to be published in September 2008. Any comments received could then be considered for inclusion with the new implementing rules which may enter into force as early as end of 2009.

comment	*114* ❖ comment by: *UK CAA* Paragraph 12.2 and Attachment 2 The operational options considered are large changes to EU-OPS or doing nothing. No consideration has been given to intermediate operational measures that could be introduced when EASA become a competent authority for aircraft operations, for example an EASA Safety Information Notice.
response	*Accepted* The Agency has already issued a Safety Information Notice (SIN 2008-29) on 4 April 2008 which gives guidance on this subject. A review and updates of this document is under consideration.

B. ATTACHMENTS - Attachment 3 - Regulatory Impact Assessment for Maintenance p. 18-19

comment	*84* comment by: *Walter Gessky* **Attachment 3 - Regulatory Impact Assessment for Maintenance (page 18)** The Agency suggestion to add more details to the regulatory text is supported.
response	*Noted*

comment	*100* comment by: *Malmo Aviation* Option 2 in discussion/coordination with a steering group.
response	*Noted*

comment	*116* ❖ comment by: *UK CAA*

	Paragraph 13 and attachments 3, 4 and 5 No timescale has been given for the Maintenance Actions. Regarding attachment 5 - acceptable means of compliance to part-145, there is no need to inspect for fluid residues if the aircraft has never come into contact with types II, III or IV anti-icing fluids, since these are the only types that leave residues capable of rehydrating and freezing. Type I fluid does not leave rehydratable residues.
response	*Noted* In the first step, the Agency would send letters to TC Holders (for EU products) and to NAAs of the State of Design (for non EU products) informing them of the serious safety concern and requiring each type certificate holder of large aeroplanes (as defined in CS-Definitions) and of commuter aeroplanes (as defined in CS-23) to review and amend as necessary, taking into account published information on fluids re-hydration: • Their published instructions and procedures for the correct application of de-icing and anti-icing fluids onto their products, and • Their maintenance instructions for the aircraft upon use of such fluids. The purpose would be to include or improve instructions as to: • What to look for (e.g. gel and dried residues), • Where to look for anti-ice residue in the aircraft structure, and • How to remove these residues effectively. In addition the maintenance instructions should give guidelines for operators on how to determine the frequency of the necessary checks. Existing published information on fluid's re-hydration could be usefully taken into account when defining the M.A.302 maintenance programme. It is foreseen that the Agency will require that the review and necessary amendments should be available to operators prior to the 2008 winter operation for aeroplanes that are most susceptible to the phenomenon (usually those equipped with one or more non-powered flight controls) and prior to 2009 winter operations for the others. If TC holders consider their aeroplanes as being less sensitive or not affected, this should be justified. When these instructions have been defined by TC holders, European operators would have to incorporate them into their maintenance programme in accordance with Part-MA.302 (f) and (g) and into their Operations Manual in accordance with EU-OPS Subpart P. To further support these actions the Agency will issue an NPA to suggest changes to Part-M in order to better address the consequences of de-icing and anti-icing fluids on continuing airworthiness. Once these instructions are available, the operators will have to review accordingly their maintenance programme as requested by PART M.A.302 (f) and (g), (see Opinion EC n°707/2006 of 8 May 2006 where the maintenance programme reviews shall ensure that the programme continues to be valid in the light of the operations). NAAs will have to ensure that these instructions have been correctly implemented by the operators before the winter programme.

B. ATTACHMENTS - Attachment 4 – Acceptable Means of Compliance to Part-M p. 20

comment 35 comment by: *Aircraft Engineers International (AEI)*

I. AMC M.A.201 (h) Responsibilities

1. Reference to aircraft includes the components fitted to or intended to be fitted to the aircraft

2. The performance of ground de-icing and anti-icing, cleaning, and re-fuelling, ~~servicing~~ activities does not require a Part-145 approval. Nevertheless, the removal of panels, cowls or covers, and use of special tools to achieve such tasks will have to be performed within a controlled maintenance environment subject to Part 145.A.50 (release to service).

Comment A: Add the green underlined text, and remove the ~~red stricken through~~ text.

Reason: As written originally this sentence could be understood to include servicing of aircraft covered under Chapter 12 of the AMM, this is presumably not the intention of this text amendment.

Comment B: If it is indeed the meaning to include this kind of servicing, then AEI is totally against this.

Reason: This kind of servicing is covered under Chapter 12 of the AMM for good reasons. Namely the requirement that it needs to be carried out by properly trained, examined and competent personnel authorised by a Part 145 Approved Maintenance Organisation (AMO) due to the complexity and the technical content of the work covered in this chapter. It should therefore NOT be left to other groups of people not under the control of a Part 145 AMO.

response *Accepted*

Comment A: accepted
Comment B: it was not the intent of the regulator to include servicing from AMM chapter 12.

comment 116 ❖ comment by: *UK CAA*

Paragraph 13 and attachments 3, 4 and 5
No timescale has been given for the Maintenance Actions. Regarding attachment 5 - acceptable means of compliance to part-145, there is no need to inspect for fluid residues if the aircraft has never come into contact with types II, III or IV anti-icing fluids, since these are the only types that leave residues capable of re-hydrating and freezing. Type I fluid does not leave rehydratable residues.

response *Noted*

As a first step of actions, the Agency would send letters to require Manufacturers of all large aeroplanes and Commuter aircraft to examine their aircraft as to the propensity for the accumulation of the said residues and review maintenance instructions taking into account published documentation

about fluid re-hydration. If necessary TC holders should amend their maintenance instructions with detailed information as to:

a.) where to look for anti-ice residue in the aircraft type,

b.) what to look for and,

c) how to clean and,

d) how to remove these residues effectively. This would include guidance allowing operators to develop, according to the aircraft usage and operational environment, their own residue removal programmes.

The results of these examinations information would be required by the Agency in a short period of time and the exercise should be done with consistent level of scrutiny. The Agency would ask manufacturers of non-powered flight controls to respond in timeframe shorter than those type certificate holders of powered flight controls.

Once these instructions are available, the operators will have to review accordingly their maintenance programme as requested by PART M.A.302 (f) and (g), (see Opinion EC n°707/2006 of 8 May 2006 where the maintenance programme reviews shall ensure that the programme continues to be valid in the light of the operations). NAAs will have to ensure that these instructions have been correctly implemented by the operators before the winter programme.

resulting text

AMC M.A.201 (h) Responsibilities
1. Reference to aircraft includes the components fitted to or intended to be fitted to the aircraft.
2. The performance of ground de-icing and anti-icing, cleaning and re-fuelling, activities does not require a Part-145 approval. Nevertheless, the removal of panels, cowls or covers, and use of special tools to achieve such tasks will have to be performed within a controlled maintenance environment subject to Part 145.A.50 (release to service).

B. ATTACHMENTS - Attachment 4 – AMC to Part-M - I. AMC M.A.201 (h) p. 20

comment

131 comment by: *REGIONAL COMPAGNIE*

Is it necessary to open panels to conduct inspection of the fluid residue?

response

Noted

Only the TC Holders' recommendations (inspections) will tell if it is necessary to open or remove some panels.

Additionally the operator may modify the nature of the inspections:

- based on the reliability;
- after amendment and new approval (direct or indirect) of the maintenance programme.

B. ATTACHMENTS - Attachment 4 – AMC to Part-M - III. Appendix I to AMC M.A.302 and AMC M.B.301 (b) p. 21-22

comment	*16* comment by: *Francis Fagegaltier Services* In paragraph 6.5.10.2 (g) first hyphen, APUs are not addressed because they are unlikely to be qualified as "components". However, in fourth hyphen, APU are noted but not in relation to the issue of APU usage during de-icing operation : see comment on §11.1 option 5.
response	*Partially accepted* According to Article 2 of EC 2042/2003, an APU is considered to be a component and qualifies for the purpose of this NPA. The use of word "component" instead of "equipment" has been preferred in the fourth bullet. Therefore the text is now corrected.

comment	*132* comment by: *REGIONAL COMPAGNIE* 6.5.10.2 (g) Why the cleaning of aircraft must be inserted into the maintenance program ?
response	*Noted* 1) This AMC does not say that the cleaning **must** be included; it just recommends assessing whether the cleaning of the aircraft may generate some maintenance actions to be taken before and after the cleaning. As example, by experience or by reliability, some airliners recommend some protection to be installed before proceeding to the cleaning of the aircraft. Such protection devices will have to be removed after the cleaning. Therefore only an approved maintenance organisation may perform such activities that may be safety related. 2) Some TCHs may recommend some technical cleaning of the aircraft: • before carrying out some maintenance tasks • in relation to the type of operations It is the operator's responsibility in liaison with their NAA to decide whether the cleaning the aircraft should be included in the maintenance programme. 3) After operations involving de-icing/anti-icing activities, the instructions from the TCH may recommend a partial cleaning of the aircraft. At this stage a difference between "cleaning of the aircraft" and "removal of the residues" might be made.

comment	*133* comment by: *REGIONAL COMPAGNIE* 6.5.10.2 (g) If any inspection task am not requested by the Type Certificate Holder (EMBRAER), which they must make ?
response	*Noted* Either the TCH recommendations exist or the operator has a reliability

programme to assess which maintenance tasks should be added in the maintenance programme.

resulting text

Appendix I to AMC M.A.302 and AMC M.B.301 (b)
Content of the maintenance programme
…/…
6.5.10 Evaluation and review.
Each programme should describe the procedures and individual responsibilities in respect of continuous monitoring of the effectiveness of the programme as a whole. The time periods and the procedures for both routine and non-routine reviews of maintenance control should be detailed (progressive, monthly, quarterly, or annual reviews, procedures following reliability "standards" or "alert levels" being exceeded, etc.).

6.5.10.1 Each programme should contain procedures for monitoring and, as necessary, revising the reliability "standards" or "alert levels". The organisational responsibilities for monitoring and revising the "standards" should be specified together with associated time scales.

6.5.10.2 Although not exclusive, the following list gives guidance on the criteria to be taken into account during the review.

(a) Utilisation (high/low/seasonal)

(b) Fleet commonality.

(c) Alert Level adjustment criteria.

(d) Adequacy of data.

(e) Reliability procedure audit.

(f) Staff training.

(g) Operational and maintenance procedures such as:

- cleaning of the aircraft or engine or components,
- technical log book exploitation, special inspection program and removal of fluid residue built up after de-icing /anti-icing tasks as requested by the Type Certificate Holder, in particular for aircraft sensitive to the building of such residues;
- special operations involving contaminated runways, medical transportation, fuel contamination environment, cargo transportation of special products such as corrosive, dirty fluid...
- special seasonal operations involving use of special components for hot or cold seasons (brakes, air conditioning, use of APU, avionic compartment etc.)

.../...

B. ATTACHMENTS - Attachment 4 – AMC to Part-M - IV. Appendix V to AMC M.A.704 p. 22

comment *5* comment by: *Peter G Richards I Eng FRAeS*

residue, volcanic dust/ash and sand

response *Accepted*

"Volcanic dust/ash" has been added to the resulting text.

comment 6 comment by: *Association of Dutch Aviation Technicians*

Pls. clarify:

In AMC M.A.301 -1- Continuing airworthiness tasks are mentioned the minimum actions for the accomplishment of the Pre-flight inspection. Item, "(f) a control that all the aircraft's external surfaces and engines are free from ice, snow, sand, dust etc" is one of those mandatory actions.

Old text:

In PART 1 "CONTINUING AIRWORTHINESS MANAGEMENT PROCEDURES" 1.11 Pre-flight inspections. Is stated in (e) Control of snow, ice dust and sand contamination to an approved standard.

The NPA new text will be: "control of snow, ice dust, anti-icing/de-icing fluid type residue and sand contamination to an approved standard.

Question: will the text in AMC M.A.301 -1- (e) also be changed to comply with the new text in 1.11?

The following item are concerning the omissions in responsibilities regarding the pre-flight inspection.

In AMC M.A.306 (a) Operators technical log system Section 3 vii. Is stated that after the accomplishment of the pre-flight inspection this inspection has to be ensured by a signature in the Operators technical log.

In AMC M.A.301 -1 (3) is stated that an operator should publish guidance to maintenance and flight personnel and any other personnel performing pre-flight inspection tasks, as appropriate, defining responsibilities for these actions and, where tasks are contracted to other organisations,

Question:

After the completion of all the mandatory actions AMC M.A.301 -1, the pre-flight inspection PFI has to be ensured by a signature in the Operators technical log, it is according AMC M.A.301 -1 (3) possible that some of those mandatory task could be carried out by other contracted organisations.

How is it possible for the crew or other qualified personnel who will sign in the Operators technical log for the completion of the PFI to verify and ensure that all the task of the PFI are carried out by several other contracted organisations?

In the case of AMC M.A.301 -1 Item, (f), how could he verify that the task has been carried out properly?

An other example is AMC M.A.301 -1 (d), how can the crew control that all doors are securely fastened before sign off the PFI in the Operators technical log?

Or in case the PFI has been performed by other qualified personnel, should he wait before signing of the PFI that all the mandatory tasks has been carried out by all the organisations involved. How is it for him possible to sign off the PFI

in the Operators technical log if task (d) AMC M.A.301 -1 has been carried out, meaning that all the doors are securely fastened.

The sign off and statement of the PFI in the Operators technical log means that the Aircraft is fit for the intended flight, if one of the mandatory actions of the PFI are not verified or could not be verified by the person who is signing off the PFI , the statement is formally not justified.

The Aircraft stays in an non-airworthy condition, meaning that the Aircraft does not comply with Part-M.

response

Partially accepted

It is already mentioned in AMC M.A.301-1 subparagraph 3 that the accomplishment of such tasks are subject to the quality system of M.A 712; therefore the quality system shall ensure that maintenance tasks are properly performed by inspection personnel that have received appropriate training and audits shall confirm that the operator's expected standard is met.

For clarification, AMC M.A.301-1 has been modified to include "de-icing, anti icing fluid".

comment

7 comment by: *Association of Dutch Aviation Technicians*

In REGULATION (EC) No 2042/2003, article 2 "definitions" is stated:

"(j) 'Pre-flight inspection' means the inspection carried out before flight to ensure that the aircraft is fit for the intended flight.

Some Operators has given the phrase ''before flight'' in article 2 an extra dimension, meaning that they have set the maximum allowable time of 4 hours before the actual flight for the accomplishment and sign off of the pre-flight inspection'

I.a.w. it has been agreed by the particular Operators National Aviation Authority (by means of the C.A.M.E.) that the PFI may be accomplished and signed off up to a maximum of 4 hours before flight.

To clarify, in this case the PFI will be not be carried out by crew, but by qualified personnel.

In our opinion this is a safety hazard for flight safety, due the fact that after signing of the PFI many unsafe things could occur in or outside the aircraft.

Especially the PFI mandatory tasks such as "control of snow, ice dust, anti-icing/de-icing fluid type residue and sand contamination to an approved standard, has no value anymore.

Question: there should not be any (economic) interpretation possibility of the phrase ''before flight'.

Is their a possibility to alter the definition of the PFI in article 2 in following new statement?

'Pre-flight inspection' means the inspection carried out immediately before flight to ensure that the aircraft is fit for the intended flight.

	If there is no possibility to alter the definition how can we solve these unsafe interpretations?
response	*Noted* This comment is outside the scope of this NPA. The intent of the maintenance part for this NPA was not to alter the definition of the "Pre-flight" but only to address the possible consequences of de-icing/ anti-icing performance in term of maintenance. Nevertheless, please find hereafter some remarks to the comment: a) It is an operator's choice to decide how long in advance the pre-flight has to be carried out before departure. Regulation (EC) No 2042/2003 does not regulate this particular issue; b) Irrespective of the operator's procedure, there is not need to issue a CRS after the pre-flight performance according to Regulation (EC) No 2042/2003 unless findings are encountered; refer to M.A.201 (d). c) Adding the word "immediately" will not stop from getting various interpretations. d) Regarding de-icing/anti-icing procedures, the operator must or should (YMO) comply with the timeframe recommended by the TCH/service provider when the product is spread. It is not the intent of Regulation (EC) No 2042/2003 to confirm whether there is a need for a pre-flight and when. e) Further guidance is published in AMC M.A.301.

comment	*17* comment by: *Francis Fagegaltier Services* In sub-paragraph (e) there is reference to "approved standard". For years, the word "approved" has been used to refer to an approval issued by an authority. Who would deliver such an approval? EASA? Someone else?
response	*Accepted* In such a case, "approved standard" is the officially recognised standard. It means those standards established or published by an official body, whether having a legal personality or not, which are widely recognised by the air transport sector as constituting good practices. The text has been changed accordingly.

comment	*134* comment by: *REGIONAL COMPAGNIE* Is it necessary that a technician is present for the removal of panels during the control of fluid residue? Is it necessary to have a scale folding during the control of fluid residue?
response	*Noted* Removal of panels must be recorded and are subject to CRS issuance by qualified personnel. The person who will issue the CRS will be responsible. The TC Holders' instructions should mention tools to be used, tolerances, procedures for cleaning and removal of residues etc.

resulting text

Appendix V to AMC M.A.704 continuing airworthiness management organisation exposition

PART 1 CONTINUING AIRWORTHINESS MANAGEMENT PROCEDURES
…/…
1.11 Pre-flight inspections
(This paragraph should show how the scope and definition of pre-flight inspection, which are usually performed by the operating crew, is kept consistent with the scope of the maintenance performed by the contracted maintenance organisations.

It should show how the evolution of the pre-flight inspection content and the maintenance programme are concurrent, each time necessary.) (The following paragraphs are self explanatory. Although these activities are normally not performed by continuing airworthiness personnel, these paragraphs have been placed here in order to ensure that the related procedures are consistent with the continuing airworthiness activity procedures.)

a) Preparation of aircraft for flight

b) Sub-contracted ground handling function

c) Security of Cargo and Baggage loading

d) Control of refuelling, Quantity/Quality

e) Control of snow, ice dust, anti-icing / de-icing fluid type residue, volcanic dust/ash and sand contamination to an officially recognised ~~approved~~ standard
.../...

AMC M.A.301-1 Continuing airworthiness tasks
.../...
1.(f) a control that all the aircraft 's external surfaces and engines are free from ice, snow, de-icing/anti-icing fluid, sand, dust etc

B. ATTACHMENTS - Attachment 5 – AMC to Part-145 p. 23

comment

116 ❖ comment by: *UK CAA*

Paragraph 13 and attachments 3, 4 and 5
No timescale has been given for the Maintenance Actions. Regarding attachment 5 - acceptable means of compliance to part-145, there is no need to inspect for fluid residues if the aircraft has never come into contact with types II, III or IV anti-icing fluids, since these are the only types that leave residues capable of re-hydrating and freezing. Type I fluid does not leave re-hydratable residues.

response

Noted

In the first step, the Agency would send letters to TC Holders (for EU products) and to NAAs of the State of Design (for non EU products) informing them of the serious safety concern and requiring each type certificate holder of large aeroplanes (as defined in CS-Definitions) and of commuter aeroplanes (as defined in CS-23) to review and amend as necessary, taking into account published information on fluids re-hydration:

- Their published instructions and procedures for the correct application of de-icing and anti-icing fluids onto their products, and
- Their maintenance instructions for the aircraft upon use of such fluids.

The purpose would be to include or improve instructions as to:

- What to look for (e.g. gel and dried residues),
- Where to look for anti-ice residue in the aircraft structure, and
- How to remove these residues effectively.

In addition the maintenance instructions should give guidelines for operators on how to determine the frequency of the necessary checks. Existing published information on fluid's re-hydration could be usefully taken into account when defining the M.A.302 maintenance programme. It is foreseen that the Agency will require that the review and necessary amendments should be available to operators prior to the 2008 winter operation for aeroplanes that are most susceptible to the phenomenon (usually those equipped with one or more non-powered flight controls) and prior to 2009 winter operations for the others. If TC holders consider their aeroplanes as being less sensitive or not affected, this should be justified.

When these instructions have been defined by TC holders, European operators would have to incorporate them into their maintenance programme in accordance with Part-MA.302 (f) and (g) and into their Operations Manual in accordance with EU-OPS Subpart P (see Opinion EC n°707/2006 of 8 May 2006 where the maintenance programme reviews shall ensure that the programme continues to be valid in the light of the operations). NAAs will have to ensure that these instructions have been correctly implemented by the operators before the winter programme.

To further support these actions the Agency will issue an NPA to suggest changes to Part-M in order to better address the consequences of de-icing and anti-icing fluids on continuing airworthiness.

B. ATTACHMENTS - Attachment 5 – AMC to Part-145 - V. AMC 145.A.70(a) p. 23

comment *135* comment by: *REGIONAL COMPAGNIE*

Is a frequency of inspection envisaged? If anything is envisaged that they must make?

response *Noted*

The TC Holders' instructions should mention the nature of the inspection, tools to be used, tolerances, procedures for cleaning and removal of residues and the recommended method to determine the frequency) etc.

That frequency of inspection shall be adapted to the type of operations, the type of fluids and any other parameters that may impact.

B. ATTACHMENTS - Attachment 5 – AMC to Part-145 - VI. AMC 145.B.10 (3) p. 23-24

comment *129* comment by: *UK CAA*

Page 23 -**VI. AMC 145.b.10 (3) Competent authority – Qualification and training**. Para 1.2 sentence f.
'…of continuing airworthiness activities and the maintenance.' The word the before maintenance should be deleted.
Justification:

	Editorial error.
response	*Accepted* The text is corrected.

resulting text

AMC 145.B.10 (3) Competent authority - Qualification and training

1. Competent authority surveyors should have:
   - 1.1 practical experience and expertise in the application of aviation safety standards and safe operating practices;
   - 1.2 comprehensive knowledge of:
     - a. relevant parts of implementing rules, certification specifications and guidance material;
     - b. the competent authority's procedures;
     - c. the rights and obligations of a surveyor;
     - d. quality systems;
     - e. continuing airworthiness management;
     - f. operational procedures when impacting the management of continuing airworthiness activities and maintenance.
   - 1.3 training on auditing techniques.
   - 1.4 five years relevant work experience to be allowed to work as an surveyor independently. This may include experience gained during training to obtain the 1.5 qualification.
   - 1.5 a relevant engineering degree or an aircraft maintenance technician qualification with additional education. 'relevant engineering degree' means an engineering degree from aeronautical, mechanical, electrical, electronic, avionic or other studies relevant to the maintenance and continuing airworthiness of aircraft/aircraft components.
   - 1.6 knowledge of maintenance standards.
2. In addition to technical competency, surveyors should have a high degree of integrity, be impartial in carrying out their tasks, be tactful, and have a good understanding of human nature.
3. A programme for continuation training should be developed that ensures that the surveyors remain competent to perform their allocated tasks.

B. ATTACHMENTS - Attachment 5 – AMC to Part-145 - VII. GM 145.A.30(j)(4 p. 24

comment	*18* comment by: *Francis Fagegaltier Services* The issue of APU usage during de-icing operation should be addressed in the NPA (see comment on §11.1 option 5).
response	*Noted* See response to comment n° 16.

comment	*136* comment by: *REGIONAL COMPAGNIE* Will it be necessary to perform a specific training for the flight crew?
response	*Noted* Yes, provisions already exist in AMC M.A.301-1 subparagraph 3.

resulting text

GM 145.A.30(j)(4) Personnel requirements (Flight crew)
.../...
2. For the holder of an JAR FCL F/EL, JAR FCL 4 subpart D gives details on the theoretical and practical knowledge and skill requirements from which appendix 1 to JAR FCL 4.160 Technical Training Course (TTC) details the following subjects:
(See JAR-FCL 4.160(b)(1))
Familiarisation with basic maintenance procedures, to give additional technical background knowledge, especially with respect to the implication of systems malfunctions, and to train the applicant in maintenance related to the Minimum equipment list (MEL). The theoretical knowledge instruction consists of 100 hours and includes the following elements:
1. Airframe and systems
2. Electrics
3. Power-plant and emergency equipment
4. Flight instruments and automatic flight control systems
Practical skills training provided by an organisation approved under Part-145 is given which includes 35 days practical experience in the following subjects:
- Fuselage and flight controls
- Engines
- Instruments
- Landing gear and brakes
- Cabin/cockpit/emergency equipment
- de-icing / anti-icing activities and subsequent inspections including removal of any residue
- Ground handling and servicing
- Certificate of completion
Following successful completion of the technical training, the training organisation carrying out the theoretical knowledge instruction and/or the practical skill training should provide the applicant with a certificate of satisfactory completion of the course, or part thereof.

B. ATTACHMENTS - Attachment 6 – Regulatory Impact Assessment for Service providers p. 25-26

comment

43 comment by: *Juha Fieandt*

The recommendation of option 2 is not sufficient as there are already industry standards available but the process is not uniform and not up the safety standard it should be. AEA has option for the minimum training requirement but this is not any rulemaking material. EASA needs to take the stand on where minimums are set. Therefore option 3 is the way to proceed.

response

Noted

The Agency notes the concerns and refers to responses given to comments 3, 10 and 24. The regulation of service providers is outside the Agency competence.

comment

54 comment by: *European Regions Airline Association*

In the Summary and Final Assessment, the Agency recommends Option 2, namely to "encourage the development of industry standards and industry monitoring programmes. Although this option does not lead to a regulatory solution, it may be considered that industry standards and monitoring programmes may bring an appropriate increase in safety."

However, in spite of the the recommendations of the UK AAIB and the German BFU for a regulatory solution to this issue, the Agency has, at this stage at least, opted to stop short of regulating the de-/anti-icing service providers in the hope that it *'may bring an appropriate increase in safety'.*
Can the Agency please advise on what grounds it has opted to dismiss the Accident Investigation Boards recommendations.

There can only be one 'best way' to de-ice or anti-ice a particular aircraft type, yet the current situation, whilst placing on operators the burden of ensuring a 'clean wing on rotation', allows individual ground icing agencies outside their control to undertake their activities with no regulatory supervision and with no obligation for consistency in practice or technique.

response *Noted*

The Agency notes the concerns and refers to responses given to comments 3, 10 and 24. The regulation of service providers is outside the Agency competence.

comment *85* comment by: *Walter Gessky*

Attachment 6 - Regulatory Impact Assessment for Service providers (page 25)

Option 2 is supported, but I recommend including the fluid providers in the development of industry standards and industry monitoring programmes.

response *Noted*

The fluid providers are involved in the current standardisation processes.

comment *130* comment by: *UK CAA*

Attachment 6 Option 2
The IATA DAQPC already meet the objective to ensure the safety guidelines, quality control recommendations and standards of de-icing/anti-icing procedures at all airports are followed.
Add reference from comment.
Justification:
Additional information to add weight to option 2.

response *Noted*

To the Agency's knowledge the DAQCP process tends to focus on service providers at larger airports so that it its coverage is not sufficient.

B. ATTACHMENTS - Attachment 7 – Regulatory Impact Assessment for Aerodromes p. 27

comment *44* comment by: *Juha Fieandt*

Airports must be involved in the de-icing process in a way that they have minimum requirements to set towards any new service provider that wouyldlike to start a de-icing service at any airport. This minimum should not only be set on fluids available but also to monitor that standards are followed and that personnel, training and equipment fulfill the requirements.

response

Noted

The Agency notes the concerns and refers to responses given to comments 3, 10 and 24. The regulation of service providers is outside the Agency competence.

comment

56 comment by: *European Regions Airline Association*

With regard to ensuring that the required types of fluid are available at all necessary locations, I am pleased that the A-NPA suggests that *'Some mechanism is required to ensure that the range of de-icing and anti-icing fluids is made available at all appropriate locations.'* I look forward to seeing this followed through expeditiously.

response

Partially accepted

The Agency wants to take appropriate action on the recommendations of the accident investigation boards. Certain limitations exists at this point, these are:

- As Commission proposal 390 foresees, the extension of scope of responsibilities of the Agency to the safety regulation of aerodromes should be in place in the year 2013(*) at the latest. Until that time the Agency has no legal remit to impose on aerodromes to ensure that all services provided at their facilities are safe for aircraft operations(**). In the meantime responsibilities remain with the appropriate bodies within the Member States, who, according to the Agency's preliminary research, do generally not regulate this area.
- The definition of the criteria for fluid availability at aerodromes also poses practical difficulties (e.g. how to define the fluids to be made available within the commercial and geographic environment).
- Certification of fluids is currently similarly difficult as they can not be considered as 'part and appliances' according to the definition included in the Basic Regulation. Therefore as for aerodromes, fluids are not within the present remit of the Agency.
- The definition of the criteria for the certification of fluids (if and when possible) is also an issue. An important element in the certification of fluids is to define a test that is both reproducible and representative.

Despite these limitations the Agency is planning to pursue the action plan as outlined in the explanatory memorandum of the CRD and in the short term act upon Type certificate holders to consistently provide the necessary information for operators to manage the residue problem.

(*) It is envisaged that on 1.1.2013 the extension of the Basic Regulation and all its Implementing Rules will be effective.

(**) Please see the relevant Commission proposal to amend the Basic Regulation in the field of aerodromes, air traffic management and air navigation services; COM(2008) 390 of 25 June 2008. Particular attention needs to be paid to the annex V a in which the Essential Requirements for the safety of aerodromes are found.

comment

86 comment by: *Walter Gessky*

Attachment 7 - Regulatory Impact Assessment for Aerodromes (page 27)

Option 2:

Rulemaking. Some mechanism is required to ensure that the range of de-icing and anti-icing fluids is made available at all appropriate locations.

In a free market the mechanism can not be an obligation to the aerodrome to have all fluids, even not requested, available. Before an operator starts operation to an aerodrome he has to verify that the required support is available (f.e. EU-OPS 1.345).

The aerodrome can provide the service on its own or through an service provider. If the service is not offered, than the rule should give the operator the possibility to organize the service.

Rulemaking should take that into consideration.
EC rules EU Directive 96/97/EYincludes aerodrome service providers requirements. It should be evaluated if this rules are sufficient to regulate all the aspects of de-icing, anti-icing.

response *Partially accepted*

The Agency agrees that the operator needs to ensure that all needed support is available for him at the location (f.e. EU-OPS 1.345). The aerodrome can provide the service on its own or through a service provider. When no suitable service is offered the airline is often at a loss. However, the Agency doubts if the ground-handling directive can be used to solve the problem as this is a directive on market access (thus economic regulation) of ground handling services to EU airports above a certain size (2 million passengers or 50,000 t cargo) and really concerned with not the service quality or safety of these services. However, this comment will be further reviewed.

comment *92* comment by: *REGIONAL (Christophe WERMELINGER)*

REGIONAL strongly support option 2, as ERA does : our concern is to be sure to get Type I fluid along with Type II or IV. Many airports only provides Type II or IV, thus increasing risk of fluid residues.

response *Noted*

comment *120* ❖ comment by: *UK CAA*

While this is clearly a long-term action, it is likely to be the most effective. The provision of deicing fluids at airports in addition to anti-icing fluids must be accompanied by the provision of sufficient deicing equipment to enable operators to deice shortly before departure, so that they don't need to anti-ice.

response *Partially accepted*

Ideally de-icing applied in close physical and temporal proximity to the take-off would replace need for anti-icing. However, this not possible at many locations (due to capacity constraints, taxiing and lack of de-icing equipment). Changing this situation fundamentally would require large investments.

Appendix A - Attachments

Letter to EASA_NPA2007-11_October 07.pdf
Attachment #1 to comment #91

D-ICE comments on EASA A-NPA 2007-11.pdf
Attachment #2 to comment #36