



# Staff Instruction

**Subject: Aircraft Critical Surface Contamination Surveillance and Monitoring Strategies**

Issuing Office:	Civil Aviation		
PAA Sub Activity Area:	Aviation Safety Regulatory Framework	Document No.:	SI 602-002
File Classification No.:	Z 5000-32	Issue No.:	01
RDIMS No.:	3662157-V30	Effective Date:	2010-12-20

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>3</b>
1.1	Purpose .....	3
1.2	Applicability .....	3
1.3	Description of Changes.....	3
<b>2.0</b>	<b>REFERENCES AND REQUIREMENTS .....</b>	<b>3</b>
2.1	Reference Documents .....	3
2.2	Cancelled Documents.....	4
2.3	Definitions and Abbreviations .....	4
<b>3.0</b>	<b>BACKGROUND.....</b>	<b>4</b>
<b>4.0</b>	<b>INSPECTOR RESPONSIBILITIES.....</b>	<b>5</b>
<b>5.0</b>	<b>CIVIL AVIATION SAFETY INSPECTOR TRAINING.....</b>	<b>5</b>
<b>6.0</b>	<b>PROGRAM IMPLEMENTATION GUIDELINES.....</b>	<b>6</b>
6.1	Major airports where De-icing Services are available.....	6
6.2	Operations at Airports with Central De-icing Facilities.....	7
6.3	Operations at Smaller or Remote Airports.....	7
<b>7.0</b>	<b>PROCEDURES AND PROTOCOLS.....</b>	<b>8</b>
7.1	On the Ground .....	8
7.2	Inspector on Another Aircraft .....	8
7.3	Inspector as a Passenger .....	8
7.4	Inspector Observing airport operations from Central De-icing Facility .....	9
7.5	Initial and Follow-On Central De-icing Facility Authorization.....	9
7.6	Inspector monitoring/inspecting Central De-icing Facility Operations .....	9
<b>8.0</b>	<b>INSPECTOR EQUIPMENT REQUIRED FOR AIRCRAFT CRITICAL SURFACE CONTAMINATION SURVEILLANCE .....</b>	<b>10</b>
<b>9.0</b>	<b>COMMUNICATIONS AND FEEDBACK REPORTING SYSTEM.....</b>	<b>11</b>
<b>10.0</b>	<b>CONTACT OFFICE .....</b>	<b>12</b>
	<b>APPENDIX A— AIRCRAFT CRITICAL SURFACE CONTAMINATION SURVEILLANCE AND MONITORING RECORD PARAGRAPH.....</b>	<b>13</b>



**APPENDIX B— SUGGESTED QUESTIONS TO BE ASKED TO ASSESS LEVEL OF FLIGHT CREW OR GROUND DE-ICING HANDLER GROUND ICING COMPREHENSION ..... 14**  
**APPENDIX C— CENTRAL DE-ICE FACILITY AUTHORIZATION PROCESS ..... 16**  
**APPENDIX D—SAMPLE CONDITIONAL AUTHORIZATION LETTER ..... 21**  
**APPENDIX E—SAMPLE FOLLOW-ON AUTHORIZATION LETTER ..... 22**  
**APPENDIX F—RECOMMENDED CENTRAL DE-ICE FACILITY CHECKLISTS FOR INITIAL AND FOLLOW-ON AUTHORIZATIONS..... 23**

## 1.0 INTRODUCTION

### 1.1 Purpose

- (1) The purpose of this Staff Instruction (SI) is to establish national procedures and guidelines associated with the surveillance and monitoring of aircraft operations when conditions of Aircraft Critical Surface Contamination (ACSC) are forecast or exist.
- (2) Furthermore since numerous airports are moving toward the implementation of Central De-Ice Facilities (CDF) this document addresses authorization considerations for these facilities.

### 1.2 Applicability

- (1) This document is applicable to Transport Canada Civil Aviation (TCCA) Headquarters and Regional personnel during the conduct of surveillance and monitoring of aircraft operations during conditions where critical surface contamination is likely.
- (2) This document is also applicable to TCCA Headquarters and Regional personnel involved in the initial and follow-on authorization of CDFs.

### 1.3 Description of Changes

Not applicable

## 2.0 REFERENCES AND REQUIREMENTS

### 2.1 Reference Documents

It is intended that the following reference materials be used in conjunction with this document:

- (a) *Aeronautics Act*;
- (b) Part VI, Subpart II of the *Canadian Aviation Regulations (CARs)— Aircraft Icing*;
- (c) Standard 622 of the CARs— *Ground Icing Operations*;
- (d) *Aeronautical Information Manual (AIM)—Flight Operations in Winter*;
- (e) Transport Publication (TP) 14052, Edition 02, dated April 2005—*Guidelines for Aircraft Ground Icing Operations*;
- (f) Transport Canada Form 26-0365, Version 0711-03—*Notice of Detention of Aircraft*;
- (g) Records Documents and Information Management System (RDIMS) 355225—*Air Carrier Flight Inspection*, form;
- (h) Current Holdover Time Guidelines as published by Transport Canada;
- (i) National Aeronautics and Space Administration's (NASA) Ground Icing training material — *A Pilots Guide To Ground Icing* (available at: <http://www.tc.gc.ca/eng/civilaviation/standards/commerce-holdovertime-menu-1877.htm>);
- (j) Aerospace Recommended Practice (SAE ARP) 5646— *Quality Program Guidelines for De-icing/Anti-Icing of Aircraft on the Ground*;
- (k) SAE ARP 5660— *De-icing Facility Operational Procedures*; and
- (l) SAE ARP 4737—*Aircraft De-Icing/Anti-Icing Methods With Fluids*.

## 2.2 Cancelled Documents

As of the effective date of this document, the following section of the following document is cancelled:

- (a) TP 3783, Issue 05, dated March 2004— Section 3.12, *Aircraft Critical Surface Contamination*.

## 2.3 Definitions and Abbreviations

The following definitions and abbreviations are used in this document:

- (a) **ACSC:** Aircraft Critical Surface Contamination.
- (b) **APM:** Airport Manager.
- (c) **ATS:** Air Traffic Services.
- (d) **AVOP:** Airside Vehicle Operator Permit.
- (e) **CASI:** Civil Aviation Safety Inspector.
- (f) **CDF:** Central De-icing Facility.
- (g) **FAA:** Federal Aviation Administration.
- (h) **POI:** Principle Operations Inspectors.
- (i) **RMSP:** Regional Master Surveillance Plan.

## 3.0 BACKGROUND

- (1) This is a new SI based largely on the material in the Air Carrier Inspector Manual TP 3783 at Revision 5 dated March 2004, on aircraft critical surface contamination. The following additional areas are addressed which, were not previously included in TP 3783:
  - (a) Surveillance and monitoring of aircraft operations from the vantage point of a CDF;
  - (b) Surveillance and monitoring of CDF; and
  - (c) Considerations for initial and follow-on authorization of CDFs.
- (2) The surveillance and monitoring functions carried out by Transport Canada Civil Aviation Safety Inspectors (CASI) during the course of their duties is of paramount importance. In order to conduct those functions in a timely, consistent and standardized manner nationally, this SI will:
  - (a) Identify minimum knowledge and training requirements expected of a CASI before being assigned monitoring and surveillance duties associated with ACSC;
  - (b) Provide procedures to be used on the ground during ramp activities;
  - (c) Provide procedures to be used when the CASI is a passenger on an aircraft and observes ACSC on the aircraft;
  - (d) Provide procedures to be used when the CASI is a passenger on an aircraft and observes ACSC on another aircraft;
  - (e) Provide procedures for conducting surveillance and monitoring operations from the vantage point of a CDF;
  - (f) Provide procedures for the initial and follow-on authorization of a CDF;
  - (g) Provide procedures for conducting surveillance and monitoring of CDF activities;
  - (h) Provide the regulatory process to follow in the event of non-compliance; and

- (i) Identify the requirement for every region to assign an ACSC Principle Operations Inspector (POI) and specify that individual's roles and responsibilities.

#### **4.0 INSPECTOR RESPONSIBILITIES**

The inspector responsibilities include:

- (a) Completing the initial and recurrent training outlined in Section 5 of this SI –Civil Aviation Safety Inspector Training;
- (b) Promoting compliance with Section 602.11 of the CARs and 622.11 of the General Operating and Flight Rules (GOFR);
- (c) Conducting ACSC surveillance on the ramp, at CDFs and on the flight deck;
- (d) Complete an Air Carrier Flight Inspection form for in-flight inspections where appropriate (see RDIMS 355225);
- (e) Reviewing and participating in meetings associated with the initial or follow-on authorization of CDF facilities;
- (f) Complete a report on each CDF check that was conducted (see Appendix A);
- (g) Where a verbal warning has been given to the pilot-in-command, if the advisory is ignored and the flight is intending to depart, the Inspector shall:
  - (i) Take appropriate measures to stop the aircraft from proceeding (see paragraph 8.7(1)(d) of the *Aeronautics Act*, Section 103.10 of the CARs, Form 26-0365 and paragraph 7.1(1)(e) of the *Aeronautics Act*;
  - (ii) Initiate the compliance process by completing a Detection Notice (Form 26-0471);
  - (iii) Secure and ensure continuity of evidence. Given that the contamination composed of ice, snow and frost will eventually melt, it is strongly recommended that pictures be taken of the aircraft and associated contamination. Such pictures should include visual references to other objects such as a ruler, pencil, etc. to assist in gauging the quantity of contamination. Further corroboration from other witness may be considered useful;
  - (iv) Provide copies of the completed reports to the appropriate managers; and
  - (v) Forward the evidence, statements if available and completed reports to the applicable Aviation Enforcement Division or Enterprise Manager (see SI SUR-006) as appropriate.
- (h) Log time expended on this task against the appropriate Activity Reporting and Standards System (ARASS) task.

#### **5.0 CIVIL AVIATION SAFETY INSPECTOR TRAINING**

- (1) This is a minimum outline of the required training. The type of training identified below assumes that the Inspector already has a considerable amount of aircraft operational experience, knowledge and training. Careful consideration of the Inspectors background will be required to determine what if any additional training and experience is required before being tasked with the functions herein.

- (2) Furthermore since the Inspector will be conducting surveillance from the airside of the airport, potentially close to moving vehicles and aircraft, on-the-job training should be considered an essential part of the training:
  - (a) Review and self-study Section 602.11 of the CARs and Section 622.11 of the GOFR;
  - (b) Review TCCA Guidelines for Aircraft Ground Icing Operations Update (TP 14052);
  - (c) Review the current year TCCA HOT Guidelines posted on the TCCA website;
  - (d) Review Aeronautical Information Manual (AIM) AIR Section 2.12, Flight Operations in Winter;
  - (e) Review NASA's training material: *A Pilots Guide To Ground Icing* (available at: <http://www.tc.gc.ca/eng/civilaviation/standards/commerce-holdovertime-menu-1877.htm>);
  - (f) Review local airport de-icing procedures. These can usually be obtained from the air operator, the de-icing service provider or airport authority;
  - (g) Review applicable CDF procedures manual if a CDF will be used as an observation location or if monitoring and surveillance of the CDF is to take place;
  - (h) Obtain an Airside Vehicle Operator Permit (AVOP) by undertaking the appropriate training for the given airport. The AVOP is usually airport specific and will be required when driving on the restricted airport premises and conducting inspection at the airfield.
  - (i) Anyone assigned to the airport duties must be familiarized with the airside responsibilities, such as: spill response, emergency response, what to do in an emergency, Foreign Object Damage, JET Blast awareness, emergency exits;
  - (j) If the individual is expected to ride in an open bucket de/anti-icing vehicle they must have received personal protective equipment training (e.g. harness and lanyard training); and
  - (k) Completion of the above training shall be recorded on the employees file.

## **6.0 PROGRAM IMPLEMENTATION GUIDELINES**

- (1) The Regions will determine the level of monitoring and surveillance appropriate to their region based partly on historical data and risk indicators. For example, if an airport in a given region decides to implement a CDF, this could be seen as a higher risk activity. This is predominately due to the fact that implementation of the CDF may disrupt the natural flow of events at the airport and things will be changing.
- (2) The regions are responsible for selecting the individuals that will perform the functions described here-in. Careful consideration in making this selection is required, given the requirement to have significant aircraft operating experience and knowledge, especially in winter time operating conditions. Selection of individuals without these competencies will in all likelihood increase the training requirements above and beyond those identified in this SI and have limiting effects on their delegation of authority.
- (3) Activities that CASI would participate in can be divided into the following several broad areas, covered below.

### **6.1 Major airports where De-icing Services are available**

When ACSC conditions are forecast, inspectors should be assigned airport surveillance duties at major airports. The Airport Manager (APM) and Air Traffic Services (ATS) shall be advised accordingly:

- (a) Record weather conditions during the monitored event;

- (b) Record as much information pertinent to each de-icing as possible (see Appendix A of this SI for sample form which can be modified to cater for regional needs as required);
- (c) Conducting inspections from passenger jet ways, or on the apron/ramp area may be required.
- (d) The inspector(s) assigned these inspection duties should have direct contact with the ATS facility by the appropriate VHF Ground/Apron Control frequency or cellular phone;

**Note:**

*It may be difficult to listen in on communications between the de-icer and the aircraft, since they may be communicating via hardwired intercom with each other. As a TCCA inspector contacting ATS, you may be required to identify yourself by first and last name. This is to ensure that you have the requisite authority in cases where you may be requesting that a take-off clearance be denied.*

- (e) Holdover times of departing aircraft should be closely monitored. Ideally, an aircraft is de-iced/anti-iced just prior to take-off. Available data, the types of de-icing fluids currently available in Canada and the possible combinations of atmospheric conditions, make it difficult to determine a maximum holdover time between de-icing and actual departure;
- (f) Inspectors should use their knowledge of aircraft types, the varied operations and meteorology to help determine when there is a risk of ACSC;
- (g) When ACSC conditions exist and aircraft are delayed for take-off, inspectors should closely monitor ground operations;
- (h) Where an inspector observes that an aircraft has exceeded the recommended hold-over times in freezing precipitation conditions or appears to have snow, ice or frost adhering to its critical surfaces, he/she will advise the pilot-in-command of the circumstances. This is normally done through the Air Traffic Control facility; and
- (i) When congestion or line-ups occur at the departure runway and holdover times are being exceeded, ATC will be directed to implement departure restrictions and other appropriate measures to reduce delays between the time the aircraft is de-iced and take-off.

## **6.2 Operations at Airports with Central De-icing Facilities**

The provisions Section 6.1 of this SI apply with the addition of the following responsibilities:

- (a) CDFs that are in possession of a TCCA authorization will typically update their winter operations program once a year. This usually occurs in mid to late summer. At that time they will submit the proposed changes for TCCA review and acceptance. The proposed changes to the CDF procedures manual shall be reviewed by the regional inspector responsible for CDF operations. If deemed acceptable a recommendation for authorization of these changes shall be forwarded to the Regional Director Civil Aviation. (See Appendix D & E of this SI for more detailed information on initial and follow-on CDF authorizations, respectively).

## **6.3 Operations at Smaller or Remote Airports**

Monitoring of air operators, corporate operators and general aviation that arrive and depart from remote airports and aerodromes when ACSC conditions are forecast should address the following:

- (a) Inspectors conducting external office functions during these period are expected to conduct special surveillance for ACSC;
- (b) The conduct of ramp checks and aircraft inspections as required;
- (c) The inspector(s) assigned these inspection duties should be in contact with the ATS facility by portable FM/VHF or cellular phone;

- (d) Appendix B of this SI contains a list of questions the inspector can use to ascertain the level and quality of de-icing operations. These questions can be directed at either the pilot or the service provider. However it is preferred to direct the questions to the pilot, since in accordance with Section 602.11 of the CARs, it is the Air Operators responsibility to ensure that the service provider is adequately trained. Where the answer and responses are not acceptable, further action maybe warranted by the inspector;
- (e) Aircraft departure delays should be closely monitored to ensure that aircraft are taking-off within a reasonable period of time after de-icing; and
- (f) Record as much information pertinent to each de-icing as possible (see Appendix A of this SI for sample form which can me modified to cater for regional needs as required).

## **7.0 PROCEDURES AND PROTOCOLS**

- (1) When ground icing conditions exist, monitoring during ramp inspections should be directed to assuring that air operators have adequate training and procedures for operating under these conditions and, if applicable, have an acceptable ground icing operations program.
- (2) Under certain circumstance (e.g. large airports) it may be beneficial to conduct the surveillance and monitoring functions with a minimum of two inspectors present. One inspector could for example be placed at the CDF while the other inspector is stationed near the active runway.
- (3) When monitoring flight operations on an airport or aerodrome, advise and coordinate communications with the appropriate ATS unit chief beforehand. Where an inspector has reason to believe that an aircraft is about to be operated and may cause an immediate threat to aviation safety the procedures in the following sections shall be used.

### **7.1 On the Ground**

- (1) The inspector shall identify him/herself advising the pilot-in-command of the requirements of Section 602.11 of the CARs and the inherent risks, and suggest inspection and or de-icing alternatives.
- (2) When the inspector believes on reasonable grounds that the aircraft is unsafe or is likely to be operated in an unsafe manner, invoke his/her authority pursuant to Paragraph 8.7(1)(d) of the *Aeronautics Act* to prevent the aircraft from taking off.
- (3) Detaining an aircraft may be accomplished by contacting the appropriate ATS facility to deny take-off clearance. In extreme cases, it may be necessary to block the aircraft's access to the runway with the assistance of the police or an airport vehicle.
- (4) Ensure that the aircraft is inspected and/or contamination removed before further flight.

### **7.2 Inspector on Another Aircraft**

As per Section 7.1 of this SI except communications would be via radio.

### **7.3 Inspector as a Passenger**

- (1) Whenever possible, ask to be assigned or choose passenger seats that give a clear view of the wing(s).
- (2) Should the aircraft push-back/start-up occur while the wings are still contaminated, the inspector should, where time permits, bring the contamination to the attention of a flight attendant or in his/her absence a flight crew member.

#### **Note:**

*In some instances de-icing and anti-icing procedures are accomplished at a site away from the terminal area. Such a facility is usually called a Central De-icing Facility. The flight deck is*

*required to inform the passengers that the aircraft will be preceding to the de-icing facility as (Subsection 602.11 (7) of the CARs).*

- (3) If the inspector feels that the aircraft is about to depart with ACSC, he/she shall identify themselves by credentials and inquire in a tactful manner about observed conditions and contamination removal options.
- (4) If the pilot-in-command does not make the required inspection or intends to depart with a contaminated aircraft the inspector shall proceed to the cockpit, identify him/herself with credentials and request that the aircraft not take-off until it the contamination has been removed, pursuant to Paragraph 8.7(1)(d) of the Aeronautics Act.
- (5) Every effort must be made to be discrete yet firm and to keep the cockpit climate as rational as possible.
- (6) Ensure that the aircraft is inspected and/or contamination is removed before take-off.

#### **7.4 Inspector Observing airport operations from Central De-icing Facility**

- (1) As an inspector, it may be advantageous to observe operations during ACSC events from the vantage point of a CDF. The facilities are generally located at strategic points on the airport, providing good oversight of aircraft movements.

**Note:**

*This activity must not be confused with monitoring and inspecting of CDFs discussed in Section 7.6. of this SI.*

- (2) An inspector planning to use a CDF to observe operations during ACSC events must be familiar with the facility. This can be achieved by:
  - (a) Reading the CDF procedure manual;
  - (b) Requesting that the CDF provide a short familiarization tour of the facility prior to the commencement of winter activities (October is typically a good time frame for this familiarization tour); and
  - (c) Informing the CDF manager of the proposed activities for the coming season.
- (3) Contact the facility manager prior to arriving on the day that the CDF will be used for observation purposes.
- (4) Be cognisant that the CDF is extremely busy during de-icing events. Every effort should be made not to interfere with CDF operations.
- (5) The inspector assigned these duties should be in contact with the appropriate ATS facility by portable VHF or cell phone unless other arrangements have been made with the CDF.

#### **7.5 Initial and Follow-On Central De-icing Facility Authorization**

See Appendix C of this SI for detailed description.

#### **7.6 Inspector monitoring/inspecting Central De-icing Facility Operations**

- (1) The Air Operators are responsible to ensure that the provision of de-icing services is conducted in accordance with Section 602.11 of the CARs and Section 622.11 of the GOFR. This requires that they conduct all necessary checks and audits to ensure that the de-icing services meet regulatory and company requirements.
- (2) Due to the volume of traffic and number of air operators at certain major airports, TCCA has deemed it appropriate to authorize certain CDFs. In the case where a TCCA authorization has been issued to a CDFs it is understood that the services being provided by the CDF meet the intent of the CARs and therefore should fulfill the requirements of an Air Operators approved ground-icing program.

- (3) The Air Operator should, nonetheless, endeavour to ensure that the CDF is supplying an acceptable service, which meets the intent of their approved program.
- (4) As of November 2010, TCCA has authorized the following CDF operations:
  - (a) Aéro MAG 2000 YUL at Montreal Pierre-Elliott-Trudeau Airport;
  - (b) Servisair at Toronto Lester B Pearson International Airport;
  - (c) Servisair at Winnipeg Airport; and
  - (d) Aéro MAG 2000 at Vancouver International Airport.
- (5) The original authorization of these facilities included an operational evaluation, review of CDF procedures manual, review of material provided to air operators when operating at the CDF, monitoring of the training provided to the de-icing crews, and monitoring of de-icing activities during ACSC events. (See Appendix F of this SI for more details)
- (6) The above CDFs are to be reviewed/inspected once a year, preferably before wintertime activities begin. Early October is a good time to conduct this activity.
- (7) The region in which the airport lies, is responsible, for the conduct of these reviews/inspections.
- (8) The review/inspection shall include the following:
  - (a) Review any operational changes from previous year, ensure those changes are clearly recorded in the company procedures manual;
  - (b) Review company operations against stated company procedures manual by reviewing file records;
  - (c) Review training records;
  - (d) Monitor training program every 3 years or when TCCA inspector assigned to CDF is changed;

**Note:**

*Monitoring of the training program does not require the inspector to attend the entire training program. A sampling of the training program should be sufficient. The sampling can be determined by reviewing the proposed training curriculum and then deciding which elements to sample.*

- (e) Review company quality assurance records for evidence of recorded discrepancies and associated corrective actions;
- (f) Review any accident or incident reports;
- (g) Document discrepancies and request company corrective action plan;
- (h) Monitor operations against stated company procedures at least 3 times per year during actual conditions where ACSC conditions are present. However if the results of Section 7.6 (8) g of this SI dictate, conduct monitoring and surveillance on a more frequent basis until discrepancies and issues are resolved; and
- (i) Log time expended on this task against the appropriate ARASS task.

## **8.0 INSPECTOR EQUIPMENT REQUIRED FOR AIRCRAFT CRITICAL SURFACE CONTAMINATION SURVEILLANCE**

The following is the minimum equipment required for inspectors involved in ACSC surveillance:

- (a) Cellular phone or a VHF portable tied to the ATS Ground/Apron Control frequency;

- (b) A vehicle may be required in some locations (in those cases a vehicle airside permit will be required, and the vehicle must be suitably equipped to operate on the airside of the airport);
- (c) Copy of TP 14052—Guidance for Aircraft Ground Icing Operations, and current HOT guidelines;
- (d) Binoculars;
- (e) Camera; and
- (f) Appropriate safety/protective equipment as per Occupational Health and Safety (OHS) requirements, as a minimum:
  - (i) Reflective vest;
  - (ii) Ear protection/protector;
  - (iii) Protective eye wear;
  - (iv) Protective footwear consistent with the environment (if around heavy equipment steel toed footwear); and
  - (v) Outer wear consistent with the meteorological condition.

## **9.0 COMMUNICATIONS AND FEEDBACK REPORTING SYSTEM**

An ACSC POI needs to be appointed in each region. This person should be responsible for:

- (a) ACSC information and liaison, advising regional inspectors and managers of any significant changes or developments;
- (b) Coordination with air operator ACSC programs;
- (c) Maintaining a library/chronology of:
  - (i) Policy and guidelines information;
  - (ii) Regulatory information;
  - (iii) Accident/safety research data
  - (iv) Advisory circulars (TCCA and Federal Aviation Administration);
  - (v) Procedures manuals for CDF to be monitored;
  - (vi) TCCA's "When in Doubt" video and associated information; and
  - (vii) Surveillance/occurrence reports.
- (d) Preparation and coordination of an ACSC surveillance plan and introduction of this plan when ACSC conditions are likely to occur or are forecast.
- (e) Attend annual Standing Committee on Operations Under Icing Conditions.

## 10.0 CONTACT OFFICE

For more information, please contact the:  
Standards Coordinator (AART)

Phone: 613-990-8234  
Fax: 613-954-1602  
E-mail: CAIRS\_NCR@tc.gc.ca

Suggestions for amendment to this document are invited, and should be submitted via the Transport Canada Civil Aviation Issues Reporting System (CAIRS) at the following e-mail address: [CAIRS\\_NCR@tc.gc.ca](mailto:CAIRS_NCR@tc.gc.ca) (or Internet address: <http://www.tc.gc.ca/CAIRS>).

[original signed by Don Sherritt]

Don Sherritt  
Director, Standard  
Civil Aviation  
Transport Canada

**APPENDIX A— AIRCRAFT CRITICAL SURFACE CONTAMINATION SURVEILLANCE AND MONITORING RECORD PARAGRAPH**

The following table can be used as a template to generate a Aircraft Critical Surface Contamination Surveillance and Monitoring Record for use by Civil Aviation Safety Inspectors. The template can be modified as required to suit regional needs.

Inspector	Date (yyyy-mm-dd)	Location	A/C Type/Flight Number
<b>Company /A/C Operator</b>			Aircraft Registration
CDF Bay #	On CDF	Requested	Comments
		Type 1 <input type="checkbox"/> Type IV <input type="checkbox"/>	
HOT Start	Off CDF	<b><u>Weather</u></b>	
Provider	<b>Airborne</b>	<b><u>ATIS</u></b>	
A/C Servisair ATS Dryden Other			
<b><u>Comments:</u></b>			
Inspectors Signature:		Date:	

**APPENDIX B— SUGGESTED QUESTIONS TO BE ASKED TO ASSESS LEVEL OF FLIGHT CREW OR GROUND DE-ICING HANDLER GROUND ICING COMPREHENSION**

<b>Flight Crew or Ground De-icing Handler Comprehension Questions</b>			
<b>Number</b>	<b>Question</b>	<b>Typical Response</b>	<b>Response: Acceptable/Not Acceptable</b>
A.1	What type of fluid will be applied or what type of fluid will you be applying today?	Both flight crew and handler should know what type of fluid is being applied (i.e.: Type I, II, III or IV). If HOT Guidelines will be used then flight crew should be aware of which brand of fluid was applied, unless of course only generic HOT guidelines will be used.	
A.2	If a Type I is being applied, at what temperature are you applying or having the fluid applied?	If a Type I is applied as an anti-icing fluid the minimum temperature of the fluid shall be at least 60 degrees Celsius at the nozzle.	
A.3	If a Type I is being applied, what is the freeze point of the fluid?  How did you determine the freeze point?	The freeze point of the Type I fluid, generally should be 10° degrees Celsius lower than the OAT.  The freeze point is generally determined by using a refractometer and chart provided by the fluid manufacturer.	
A.4	How long has the fluid been sitting in your vehicles tanks, totes or other container?  Is the fluid continually heated, for example by using an immersion heater?	If the handler is unable to confirm how long the fluid has been stored in either the vehicle or other container, this should be cause for concern.  If this is the case, it is possible to adversely affect the fluid characteristics. If a sample of the type I fluid appears overly dark in color, it might be possible that it was heated continuously.	
A.5	How recently has the fluid been tested to ensure it meets its performance requirements?	If fluid has been left in containers or vehicle tanks for a long time, its performance may degrade. It is generally recommended that fluid samples be sent to the fluid manufacturer for testing on a periodic basis. The fluid manufacturer will usually specify a recommended sampling frequency.	

<b>Flight Crew or Ground De-icing Handler Comprehension Questions</b>			
<b>Number</b>	<b>Question</b>	<b>Typical Response</b>	<b>Response: Acceptable/Not Acceptable</b>
A.6	What is the LOUT for the fluid being used today?	This is the Lowest Operational Use Temperature for the fluid in question. Using the fluid below this temperature is not recommended by the manufacturer, since it is possible that the fluid not shear during the take-off run and remains on the aircraft affecting overall performance.	
A.7	When a Type II, III, or IV fluid is being applied, what is the viscosity of the fluid you are applying today?	A fluid whose viscosity is below the Lowest On-Wing Viscosity for that fluid, will not provide the HOT performance indicated in the HOT Guidelines.	
A.8	How will you conduct the post application inspection (Visual or Tactile)?	General purpose question to determine if they have considered the post application procedures and inspection requirements.	
A.9	How will you indicate to the flight crew that the fluid application is complete and they may proceed?	Lack of adequate communications has often led to de/anti-icing accidents, with resultant injury and sometimes death. It is very important that both flight crews and ground crews consider appropriate procedures whether visual or aural to indicate that the de/anti-icing operations are complete and that it is safe for the aircraft to move.	
A.10	Does your company provide you with training in the application of de/anti-icing fluids?	If then individual has not been trained in the proper application of de/ant-icing fluids then they should not be applying fluids to aircraft.	

## APPENDIX C— CENTRAL DE-ICE FACILITY AUTHORIZATION PROCESS

### 1.0 INTRODUCTION

- (1) Wintertime de-icing operations are a common aspect of operating aircraft in Canada. The necessity of conducting such operations in a safe and efficient manner cannot be underestimated. At larger airports where traffic flows and environmental concerns warrant it, Central De-ice Facilities (CDF) have been established.
- (2) There are more and more Canadian airports seeking to establish CDFs on their premises. However there are currently no regulations or standards that govern the operations of such facilities.
- (3) The intent of this Appendix is to provide the Civil Aviation Safety Inspector (CASI) faced with the task of assessing the acceptability of a CDF with as much guidance and best practices as possible.

### 2.0 BACKGROUND

- (1) Current operational regulations and standards related to Ground Icing Operations are contained in Section 602.11 of the Canadian Aviation Regulations (CARs) and Section 622.11 of the General operating and Flight Rules (GOFR). The onus on regulatory compliance to this regulation and its associated standard is with the air operator.
- (2) When Section 602.11 of the CARs/Section 622.11 of the GOFR were originally drafted, the concept of a central de-ice facility did not exist. For the most part each air operator was responsible to either conduct their own de-icing operations or secure the necessary services through direct contracts with de-icing providers.
- (3) In the late 1990's, at airports such as Montreal and Toronto, it was recognized for a number of reasons that having multiple providers operating on multiple locations at the airport was not environmentally sound. These types of operations also posed a safety risk when de-icings were conducted in close proximity to each other. A read of the Transportation Safety Board (TSB) Royal Air Marco accident report will help to understand the dangers posed by poor communications during de-icing activities. This report is available at the following website: <http://www.tsb.gc.ca/en/reports/air/1995/a95q0015/a95q0015.asp>
- (4) Without any regulations in place to cover the operation at de-ice facilities (later to be called CDF), an effort was put in place by the Toronto Airport Authority, the air operators, the service providers and Transport Canada to institute a single service provider facility at Pearson Airport. Through the good will of all parties and in the interest of safety, a Transport Canada issued conditional authorization allowing air operators to incorporate the Toronto CDF procedures into their programs was issued on December 21, 1998. Final Transport Canada authorization was issued on June 1999. Likewise the Montreal CDF was issued an interim authorization on September 16, 2002, with a final authorization issued April 28, 2003. These Transport Canada authorizations did not relieve the air operator of their operational responsibilities to ensure that the service being provided is adequate and compliant with the regulations.
- (5) The overriding driving force from an operational perspective is that there is one set of procedures that applies to all operators using the facility for a given aircraft type. Thus all air operators using a Boeing 737NG will receive the same de-icing treatment. In the past a de-icing service provider had to be trained by each and every operator that sought their service. Thus it was conceivable that a service provider had to be competent in multiple ways of de-icing one aircraft type. At larger facilities such duplication was deemed very costly and presented potential safety hazards.

### 3.0 STAKEHOLDERS AND ASSOCIATED RESPONSIBILITIES

The principle stakeholders responsibilities associated with the commissioning and operation of a CDF are:

- (a) Air Operator;
- (b) Airport Authority;
- (c) Service Provider; and
- (d) Regulatory Authority -- Transport Canada.

#### 3.1 Air Operator

- (1) Each air operator is still responsible to comply with the Canadian Aviation Regulations that pertain to their particular operations. In the case of ground de/anti-icing operations these are contained in Section 602.11 of the CARs and Section 622.11 of the GOFR.
- (2) The air operators will therefore play a critical role in the planning and development stages of a CDF given their direct need to comply with operational regulations.
- (3) Operators of Subpart 705 of the CAR must be compliant with Subpart 107 of the CAR. The air operator will therefore be in a position to drive both the airport authority and service provider to institute their own Safety Management System (SMS) programs. The air operators should ensure that the Airport Authority and CDF service provider SMS programs include self auditing provisions.

#### 3.2 Airport Authority

- (1) At some point in time, a particular airport may decide for any number of reasons (e.g. environmental, cost saving, throughput.) to unilaterally restrict de-icing operations to a single service provider. This particular action may cause considerable distress to the air operators and their current de/anti-icing providers. The air operator may feel a loss of control over processes and procedures for which they have a regulatory responsibility.
- (2) It is important that under these circumstances the air operators, educate the airport authority such that an adequate Request for Proposal (RFP) be issued.
- (3) The airport authority will normally be responsible for issuing RFPs. It is important to note that the airport authority may have very little knowledge in the area of aircraft de/anti-icing operations. They may be strictly driven by cost considerations.
- (4) In the future airport authorities will be required to put into place a SMS. This may lead them to require that all bidders must have a SMS in place as a pre-requisite to the bidding process.

#### 3.3 Service Provider

- (1) The service provider is responsible for delivering a ground-icing program that is acceptable to the air operators, the airport authority and ultimately the regulatory authorities.
- (2) Furthermore the service provider must conduct its operations in accordance with the authorized ground-icing program.
- (3) Service providers are strongly encouraged to implement a SMS and to conduct their own self audits and make these available for air operator, airport authority and regulatory review.

#### 3.4 Regulatory Authority

- (1) There is no intent in either the short or long term for Transport Canada to create new regulations that would govern the operation of CDFs. Therefore the main purpose for the regulatory authority participation in this process is to promulgate best practices/procedures associated with CDFs. Furthermore given the preponderance of inclement winter weather in Canada and the large volume of aircraft movements at CDFs, oversight of these facilities by Transport Canada is

- strongly recommended. Furthermore foreign authorities expect that there is a level of domestic authority oversight at Canadian CDFs by Transport Canada. For example the extent of Federal Aviation Administration (FAA) oversight of US carriers operating into Canada is based in part on FAA understanding of Transport Canada's role and oversight of CDFs.
- (2) During the initial request for proposal and tendering process, Transport Canada employees should remain clear of any contractual issues between the air operator, airport authority and potential service providers. Transport Canada does not have regulatory jurisdiction over Service Providers or the Airport Authorities.
  - (3) Often the bidders will request that Transport Canada indicate what is required to obtain a Transport Canada CDF authorization. The Transport Canada "approval" is really an authorization (see appendix D for sample authorization) that allows air operators to incorporate the CDF procedures into their own ground-icing program. The intent is that everyone utilizing the CDF uses a standardized set of procedures.
  - (4) Any subsequent oversight by Transport Canada of the facility is focused on ensuring that operations are conducted in accordance with previously authorized procedures.
  - (5) Regional TCCA Safety Inspectors will be appointed during the initial and follow-on authorization phases. Transport Canada Headquarter personal will assist by providing technical and operational support where and when required.
  - (6) At a very high level the following broad areas need to be assessed during the initial authorization (a detailed checklist is provided in Appendix F).
    - (a) Review of quality assurance provisions (i.e. SMS) and record keeping;
    - (b) Assessment of the initial training program;
    - (c) Monitoring of classroom training and practical training;
    - (d) Assessment of the physical aspects of the facility;
    - (e) Assessment of fluid storage, handling, dilutions, testing equipment and facilities;
    - (f) Review of communication protocols;
    - (g) Incident/error reporting and correction protocols;
    - (h) Environmental and employee safety aspects; and
    - (i) Review Service Provider Program Content (see C.4 for suggested program).
  - (7) In the past, once the inspector was satisfied with the CDF assessment, he would have issued a recommendation to Headquarters for issuance of an initial authorization letter. This authorization letter was then signed by the Director Standards Branch.
  - (8) With the current organization in place it is recommended that the authorization letter be issued by the Regional Director Civil Aviation or his/her delegate.
  - (9) The initial authorization will normally be a conditional authorization. The concept of a "conditional or interim authorization" was used for the Toronto, Montreal, Winnipeg and Vancouver CDFs.
  - (10) During the conditional acceptance phase these facilities were closely monitored by Transport Canada Inspectors during the first winter of operations. It is also important during this phase to ensure that air operators are conducting their own assessments of the CDF. Provided that there were no significant issues and that all issues were adequately addressed a full authorization can then be issued.
  - (11) It is very likely that the service provider will be updating their program based on the previous years activities, the introduction of new technologies or a change in the aircraft manufacturer's recommended de/anti-icing procedures.

- (12) Under these circumstances the service provider will seek regulatory acceptance of the proposed changes.
- (13) The service provider is expected to identify all changes to their program and brief Transport Canada accordingly.
- (14) Once satisfied with the changes a letter can be issued by Transport Canada authorizing use of the revised manual.
- (15) It is strongly recommended that the letter identify the following:
  - (a) Revision and date of latest service provider manual;
  - (b) List of Changes; and
  - (c) Any other information that might be pertinent.

#### **4.0 SERVICE PROVIDER PROGRAM CONTENT**

- (1) A review of previously authorized CDFs indicates that a certain number of elements need to be addressed for the CDF to operate in a safe, effective and efficient manner. What follows below is what is considered to be the minimum content that needs to be addressed in a CDF Service Provider Program. No attempt is made to elaborate on each individual area, since there are numerous documents that can be referenced for greater detail.
- (2) It should be noted that there are elements which need to be addressed which lie outside of Transport Canada's purview, such as: snow removal, health & safety, etc. Such elements are the responsibility of other authorities (either provincial or federal) and are included here for completeness. The inspector need not delve into these areas, other than to ascertain that they are being addressed. If they are not being addressed then the service provider should be made aware that they may have to comply with other provincial or federal regulations.
- (3) As a minimum the service provider program should cover the following:
  - (a) Company Organizational Structure;
  - (b) Layout of CDF;
  - (c) Description of aircraft that can be accommodated at facility;
  - (d) De-Icing Procedures;
  - (e) Specialized procedures if applicable (forced air, infra-red, etc);
  - (f) De-Icing Vehicle Operation;
  - (g) De-icing Vehicle Maintenance;
  - (h) Communications;
  - (i) Control Center (Also referred to as Ice House in many cases);
  - (j) Glycol Management;
  - (k) Environment;
  - (l) Snow Removal Plan;
  - (m) Emergency Procedures;
  - (n) Contingency Plans;
  - (o) Training Plan;
  - (p) Health and Safety;

- (q) Security Plan; and
- (r) Quality Assurance and Control Program.

**APPENDIX D—SAMPLE CONDITIONAL AUTHORIZATION LETTER**

October 27, 2010

Mr. De-Icer  
Supervisor  
Some Airport CDF  
Some place, Some Province  
Some PostalCode

Dear De-Icer:

Transport Canada has completed a review of "your" De-Icing Facility. This included a review of the "your" De-icing Manual for "your" De-ice facility, examination and familiarization of the physical facilities as well as monitoring the initial De-icing Vehicle Operator training course.

This letter constitutes conditional authorization of the "your" De-icing Manual for the "your" De-Icing Facility. This conditional authorization allows air operator's to include the appropriate references and sections from the "your" De-ice Manual into their own ground de-icing program. This conditional authorization does not alter the air operator's responsibilities under Section 602.11 of the *Canadian Aviation Regulations* (CARs) and Section 622.11 of the General Operating and Flight Rules (GOFR).

In order to achieve final authorization, the following actions are required:

- (1) A list of effective pages complete with revision number and the date each page was approved shall be developed for the "your" De-icing Manual;
- (2) Transport Canada will have to monitor all training courses as only the initial De-icing Vehicle Operator Training Course has been monitored to date;
- (3) The policy and procedures documented in "your" De-icing Manual will be monitored by Transport Canada inspectors to verify program compliance;
- (4) Transport Canada and "you" will jointly complete a review of the "your" De-icing Manual after the first de-icing season and "you" will make any necessary revisions to the manual.

This conditional authorization will remain in effect until "some date in the future".

Should you have any questions related to this matter please contact Inspector at xxx.xxx.xxxx.

Sincerely,

Regional Director Civil Aviation or his/her delegate

**APPENDIX E—SAMPLE FOLLOW-ON AUTHORIZATION LETTER**

August 22, 2010

Mr. De-Icer  
Supervisor  
Some Airport CDF  
Some place, Some Province  
Some PostalCode

Dear De-Icer:

The proposed changes in Revision 5 (dated August 1, 2010) have been reviewed and deemed acceptable.

This letter constitutes authorization of the "your" De-icing Manual for the "your" De-Icing Facility. This authorization allows air operator's to include the appropriate references and sections from the "your" De-ice Manual into their own ground de-icing program. This authorization does not alter the air operator's responsibilities under Section 602.11 of the *Canadian Aviation Regulations* (CARs) and Section 622.11 of the General Operating and Flight Rules (GOFR).

We note that the principle changes include:

- (1) Replacing DOW chemical UCAR ADF/AAF ULTRA+ with DOW Chemical UCAR Endurance EG106;
- (2) Updating HOT guidelines in accordance with changes to 1) above;
- (3) A number of editorial changes and improvement to the graphic illustrations;
- (4) CRJ and ERJ unique procedure for tactile inspections;
- (5) Changes to truck inspection forms;
- (6) Changes to viscosity meter measurement procedures;
- (7) Modifications to the frequency of fluid quality control test procedures.
- (8) Updating the Aerodrome Chart;
- (9) Updating HOT guidelines in accordance with published 2010 – 2011 HOT Guidelines; and
- (10) Updated Type IV application procedure to add additional detail and instructions.

Transport Canada has an ongoing requirement to monitor ground icing programs in Canada, and will continue to monitor this facility as required. Subsequent or future changes to "your" Deicing Manual will require Transport Canada review and acceptance. Should you have any questions, or concerns, please contact Inspector at (xxx) xxx xxxx.

Regional Director Civil Aviation or his/her delegate.

**APPENDIX F—RECOMMENDED CENTRAL DE-ICE FACILITY CHECKLISTS FOR INITIAL AND FOLLOW-ON AUTHORIZATIONS**

The following checklists can be used as a guide to determine the CDFs level of operational readiness. Although the responsibility to ensure that the services in accordance with the required regulations lies with the air operator, it is in Transport Canada's interest to determine the facilities readiness. **(Y = Yes, N = No, NA = Not Applicable, X = Unsatisfactory)**

	Questions	Y	N	NA	X	Comments
<b>PD</b>	<b>Procedures and Documentation</b>					
1	Does the CDF have a Quality Assurance / Quality Checking System (e.g. Safety Management System Plan) in place?					
2	Is there evidence that the SMS is operational and being used?					
3	Does the CDF conduct self-audits? If so are the self audit reports available for review?					
4	Is there a structured program for monitoring of the de-icing operations on a periodic basis?					
5	Does the CDF have a Ground Icing Procedure Manual? Is the Manual kept up to date? Is the Manual based on industry recommended practices and procedures? (SAE, AEA, TC, etc.)					
6	Is there a mechanism to inform de-icing operators of changes to procedures on a day to day basis? Do the operators acknowledge having read the changes?					
7	Does the CDF distribute its operating procedures to all air operators utilizing the facility.					
8	Does the manual specify the functions and responsibilities for all personnel associated with CDF activities?					
9	Does the manual define the required co-ordination with ATC and Airport Authorities? Has this co-ordination been implemented?					
10	Does the manual specify an individual responsible for ensuring that enough trained and qualified personnel are available to de-ice/anti-ice Aircraft?					
11	Does the manual specify an individual responsible for ensuring that adequate facilities and equipment are available to de-ice/anti-ice Aircraft?					
12	Does the manual specify an individual responsible for ensuring ground personnel have access to current manuals for conducting operations under ground icing conditions?					

	Question	Y	N	NA	X	Comments
<b>TRN</b>	<b>Training and Qualification</b>					
1	Do you have a basic training program in place for de-icing/anti-icing of aircraft on ground?					
2	Do you have a train-the-trainer program in place? (might not be applicable to CDF)					
3	Is basic training performed with the staff actually performing de-icing/anti-icing?					
4	Is annual refresher training performed with the staff actually performing de-icing/anti-icing?					
5	Do you have current training manuals available from air operators utilizing your facility?					
6	Do you have your own de-icing/anti-icing training manual?					
7	Is the training based on either SAE ARP 4737, SAE ARP 5149 or AEA Recommendations?					
8	Is the training updated to comply with the latest developments and regulations?					
9	Is the success of the training evaluated?					
10	Is a written test established and administered?					
11	Is there supervision during the written examination?					
12	Are the students coached during the written examination? (This may best be determined by interviewing 2-3 students and asking them if they attended classroom instruction, and whether they were coached during the written)					
13	Is the examination corrected to 100% and is there evidence of such correction?					
14	Is the examination signed by both instructor and student?					
15	Are the training records retained and available for review?					
16	Do personnel receive training of revision/updates to the current program and is it documented?					
17	Was training conducted on each type of de-icing truck by a trainer with a student and was this recorded?					
18	Is mid-season refresher training provided and documented?					
19	Identify types of aircraft trained on (if list is long attach separate sheet or refer to company manual which identifies types).					

	Question	Y	N	NA	X	Comments
<b>EQP</b>	<b>De/Anti-Icing Equipment</b>					
1	Do your vehicles comply with existing standards?					
2	Are the filling ports, tank openings, and tanks correctly marked with fluid type and/or mixture?					
3	Are the spraying nozzles/selectors correctly marked with fluid type and/or mixture?					
4	Is the fluid mixed in the vehicles?					
5	Is it possible to spray with this vehicle all expected Aircraft types and sizes for your operation?					
6	Is the vehicle equipped with operational communication system? a) ground to ground; b) air to ground; and c) driver to operator.					
7	Is the vehicle maintained according to the inspection schedule given by the manufacturer (as a minimum the required maintenance work)? Are maintenance records available?					
8	Are any discrepancies on the vehicle visible, which could negatively influence the safety of the vehicle, airplane, crews and/or passengers? Note: examples are flat tires, leaking brake system, corrosion of the boom, missing wheels, dropping hydraulic fluid, etc.					
9	Specify vehicles used at this facility.					
10	Is temperature of Type I heated fluids and fluid mixtures at or above 60° C (140° F) at the nozzle? How is this ensured or monitored?					
11	How is the fluid mixed?					
12	Are refractive index checks completed on a regular basis? Are they documented?					
13	Can the de-icing fluid reach all appropriate parts of the aircraft and can the boom reach sufficient height so that the operator can directly see the area being de/anti-iced, such as over a T-tail?					
14	Are spraying nozzles and/or fluid selection switches/panels as appropriate, properly marked with mixtures rate and or fluid type, when more than one nozzle is installed?					
15	Can Type II, III, or IV fluid (undiluted or hot mix) be sprayed without degrading the fluid beyond required limits?					

	Question	Y	N	NA	X	Comments
<b>EQP</b>	<b>De/Anti-Icing Equipment</b>					
16	If fluid is mixed by a vehicle proportional mixing-system, is the mixing system checked according to a maintenance schedule and are the checks recorded.					
<b>OTHER EQUIPMENT</b>						
17	Is there a fall protection harness and lanyard available for each open bucket truck and is it being utilized.					
18	Are harnesses and lanyards free from cuts, abrasions, etc.					
19	Are particulate masks available and utilized.					
20	Is eye protection available and utilized?					
21	Does the facility have access to at least 2 refractometers?					
22	Is a fixed deicing/anti-icing installation for fluid application in use?					
23	Is a "Fixed Infrared De-icing System" (hangar or tent type installation) in use?					
24	Is a "Mobile Infrared De-icing System" (mounted on a standard or specialized vehicle) in use?					
25	Is a "Forced Air Deicing System" (mounted on a standard or specialized vehicle) in use?					
26	Is any other deicing/anti-icing device available?					

	Question	Y	N	NA	X	Comments
<b>FAC</b>	<b>Facilities</b>					
1	Is the fluid stored properly in the designated tanks, trailers, cubitainers or barrels?					
2	Is the fluid heated in a storage tank?					
3	If the fluid is heated in the storage tanks, what method of heating is employed and to which temperature is the fluid heated?					
4	Do you have sufficient storage capacity? a) Type I; b) Type II; c) Type III; d) Type IV.					
5	Is the maximum applied heating temperature in the process within the limits					

	Question	Y	N	NA	X	Comments
<b>FAC</b>	<b>Facilities</b>					
	given by the fluid manufacturer?					
6	Are storage tanks properly labelled?					
7	Does storage of fluid comply with fluid manufacturer's requirements?					
8	Does storage facility equipment meet fluid manufacturer's recommendations for: a) transfer systems? b) application equipment? c) heating?					
9	Are tanks periodically checked and documentation maintained?					
10	Do airline personnel (staff releasing the airplane) have access to the position where de-icing/anti-icing is performed during and after de-icing/anti-icing treatment?					
11	Is all equipment (e.g.: refractometers) calibrated or functionally checked periodically and are these recorded?					

	Question	Y	N	NA	X	Comments
<b>PDC</b>	<b>Post De/Anti-Icing Check</b>					
1	Are the responsibilities associated with the Post De/Anti-Icing Check defined in the procedures manual?					
2	Are the individuals conducting the Post De/anti-Icing check trained and operating in accordance with the procedures manual?					
3	Are communications between the flight crew and the de/anti-icing provider in compliance with the procedures manual?					
4	Are written procedures established for the communication between the staff performing the de/anti-icing and the staff performing the Post De/Anti-icing check (unless of course it's the same individual)?					
5	Where necessary does the individual conducting the Post De/Anti-icing check have access to equipment offering sufficient visibility of the aircraft parts to be checked?					