



Frankfurt Aircraft Deicing Plan Winter Season 2018/2019

The contents of this plan are continuously reviewed, updated and developed by a working group consisting of members from the relevant departments of Fraport AG, FRA-Apron Control GmbH, German ATC (Deutsche Flugsicherung GmbH - DFS), N*ICE Aircraft Services & Support GmbH.

The English Version of the Aircraft Deicing Plan is for reference purposes only. The binding document will be published in the German language before the beginning of every Winter Season by Fraport AG.

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2. Introduction

This document describes the facilities and operational procedures for de-icing/anti-icing of aircraft on the ground during the annual aircraft de-icing/anti-icing period (Oct. 15th - April 30th of the following year). The contents of this plan have been agreed upon between the Airport Operator Fraport AG, FRA- Apron Control GmbH, the Deutsche Flugsicherung GmbH (DFS) being responsible for air traffic control and N*ICE Aircraft Services & Support GmbH, the provider for de-icing/anti-icing of aircraft on the ground. This document and all changes are presented to the Airline Operators Ground Committee (AOC) on behalf of the aircraft operators.

The Aircraft de-icing Plan's purpose is the safe, orderly and efficient de-icing of aircraft on terminal or apron positions including designated areas for de-icing aircraft. The plan is intended to be primarily used by all airline operational staff as detailed information and has been published in order to ensure that all regulations and procedures for de-icing/anti-icing of aircraft on the ground at Frankfurt/Main are known and adhered to. It shall further serve as a reliable guideline for optimising procedures to achieve the maximum use of available capacity.

In no case shall the rules and procedures as written in the Frankfurt Aircraft Deicing Plan be construed as superseding the responsibility of the aircraft operator and/or responsible cockpit crew to carefully analyse meteorological and operational conditions for relevant flights, especially including the preparation of the aircraft for de-icing/anti-icing. The aircraft operator's pilot in command remains ultimately responsible for the safe operation of the aircraft under icing conditions.

The regulations and procedures established in the Frankfurt Aircraft de-icing Plan do not supersede the procedures for de-icing/Anti-icing of aircraft on the ground officially published in the German Aeronautical Information Publication (AIP).

3. Documentation and Fluids

In addition to the information contained in the German Aeronautical Information Publication (AIP) the valid version of the following documentation shall apply:

- SAE AS 6285 Aircraft Ground de-icing/anti-icing Processes.

The de-icing/anti-icing fluids currently used at the Frankfurt Airport are SAE Type I and SAE Type IV. The manufacturer and the product name will be published separately by N*ICE before the start of the winter season.

Note:

Capacity restrictions due to winter weather conditions, distances between aircraft parking positions and the designated runway can result in extended taxi times. Therefore it is highly recommended that aircraft operators submit applications to their respective airworthiness authority requesting the adoption of so called brand name tables for SAE Type IV Anti-icing Fluid and authorising longer hold over times (HOT) than Generic Tables.

4. General Information and Operational Partners

Winter conditions can cause an immense additional workload for everybody involved that can possibly result in bottleneck situations causing problems for aircraft handling due to the following:

- limited capacity of equipment available for the de-icing/anti-icing of aircraft and airport surfaces (e.g. runways, ramp areas, etc.),
- constantly changing weather situations,
- unavoidable delays and foreseeable cancellations.

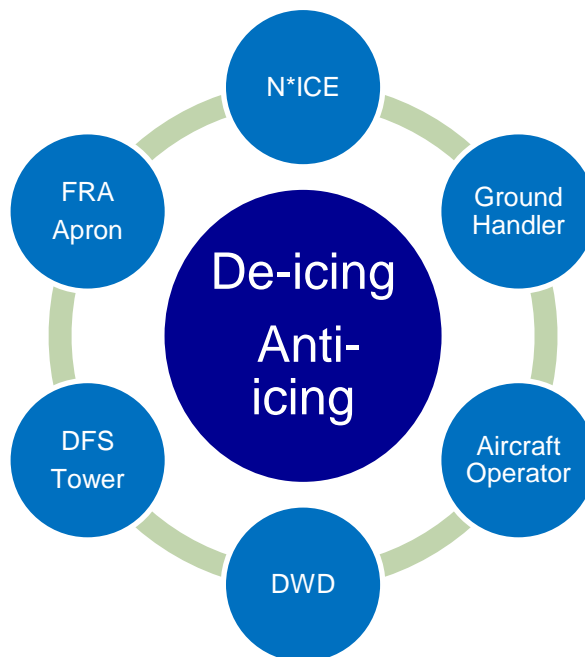


Illustration 1. Operational Partners

During the annual de-icing season, FRA-Apron Control GmbH and N*ICE monitor weather forecasts to determine the necessity for aircraft de-icing/anti-icing in order to make the best use of available capacity. The Aircraft De-icing Center (ADC) is operated by N*ICE.

The de-icing/anti-icing of any given aircraft shall be decided upon in coordination between the pilot in command (PIC) or aircraft operator and N*ICE. The PIC will communicate his request regarding procedure to be used and applicable ADF mixture ratios. N*ICE will recommend a de-icing/anti-icing procedure and ADF concentration for aircraft de-icing if requested by the PIC according to the weather situation and outside ambient temperature. The PIC shall make the final decision about which de-icing/anti-icing procedure and ADF concentration that is to be used.

Outside of the annual de-icing season (May 1st – Oct. 14th) N*ICE will have one de-icing/anti-icing vehicle on standby in case of unexpected requests. The time required for activation of qualified staff and preparation of the de-icing/anti-icing vehicle (e.g. heating of ADF on board and driving to the aircraft parking stand) until arrival at the aircraft parking stand shall be calculated with 45 minutes. A timely request is recommended and can only be made per telephone in advance (for contact details please refer to **Appendix D**).

4.1 Setting Priorities for Departing Flights

According to German Aviation Law (LuftVZO §45 Abs. 2), the airport operator will not set priorities for departing flights, in order to prevent unequal treatment. This also applies to N*ICE as the provider of Aircraft de-icing/anti-icing services.

Exemptions may be granted to:

- Ambulance flights when a medical emergency is given,
- Flights transporting LHO (Living Human Organs,)
- Government flights.

Departure flights with a critical crew duty time limitation shall, if at all possible, be given priority to the extent that the flight can be operated within the legal crew duty time. It is the aircraft operator's responsibility to inform the latest airborne time the flight can be carried out at the earliest possible time.

When the number of aircraft de-icing requests reaches the point that aircraft with critical crew flight curfews cannot be in time, the following procedure will be activated:

- The flight crew of departing flights with a critical flight curfew shall report this to N*ICE via radio communication (see Appendix D).
- N*ICE sets the de-icing/anti-icing sequence priority with the goal of avoiding infrastructural bottle neck situations for airport operations, the total number of affected passengers, and in general favoring wide-body aircraft before narrow-body aircraft. If known and if at all possible, the consequence of eventually required flight crew replacements shall also be put into consideration.

The TOBT-Agent responsible for the TOBT generally has the possibility to switch the sequence of departing flights that do not already have a CTOT. Possible flights that can be switched will be displayed in the system "CSA-Tool". The DFS (Tower) is responsible for deciding whether a flight can be switched or not. Before a switch of sequence will be granted, the switch of sequence shall be coordinated with the DFS (Tower) under the telephone number **069 6 38 09 51 06**. Departing flights with different designated runways cannot be switched.

5. Information Exchange

For the purpose of the A-CDM procedure necessary data for the de-icing of aircraft is exchanged between operational partners.

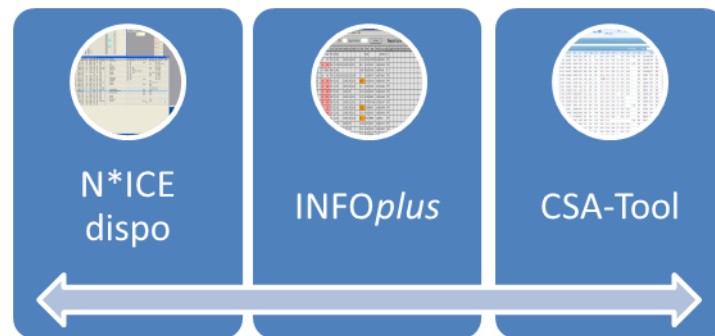


Illustration 2. Data Exchange Display

The A-CDM status messages, de-icing times and de-icing request messages are published and displayed in the “CSA-Tool” and INFOplus systems.

5.1 A-CDM Status Messages and De-icing Times

Acronym	Meaning	Definition
ACZT	Actual Commencement of de-icing Time	The actual time at which de-icing operations of an aircraft starts
ADB	Actual De-icing Begin	A-CDM@FRA process status
ADE	Actual De-icing End	A-CDM@FRA process status
ADIT	Actual De-icing Time	ADIT = AEZT – ACZT (actual time of de-icing duration)
AEZT	Actual End of De-icing Time	The time when de-icing operations of an aircraft ends
DCR	De-icing Company Ready	A-CDM@FRA process status
DVA	De-icing Vehicles Allocated	A-CDM@FRA process status
DVP	De-icing Vehicles on Position	A-CDM@FRA process status
ECZT	Estimated Commencement of De-icing Time	The estimated time when de-icing operations of an aircraft are expected to start
EDIT	Estimated De-icing Time	EDIT = EEZT – ECZT (estimated time of de-icing duration)
EEZT	Estimated End of De-icing Time	The estimated time when de-icing operations of an aircraft are expected to end

5.2 Status Messages for de-icing Requests

Acronym	Meaning	Remark
ICE = C	Pre de-icing Check	Check if Aircraft de-icing is necessary
ICE = E	De-icing was requested	De-icing was requested by pilot, Aircraft Operator or Ground Handler via telephone, radio or data link
ICE = F	Pre- / Early de-icing	Aircraft de-icing before ground handle activities
ICE = P	De-icing on Position	De-icing will occur on aircraft parking stands
ICE = R	Remote de-icing	De-icing will occur on de-icing Pads or on defined apron parking stands
ICE = S	Cancellation of de-icing	De-icing has been cancelled by pilot, aircraft operator or N*ICE

5.3 Duration of de-icing/Anti-icing

The following illustration displays the duration of the de-icing/anti-icing process. This encompasses the vehicle preparation time for position or remote de-icing, plus either the estimated time for de-icing (EDIT), or the actual time needed (ADIT).

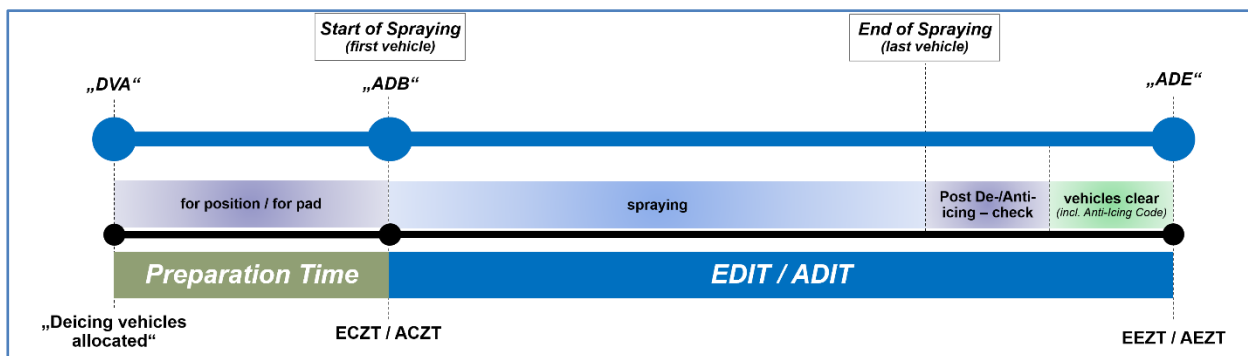


Illustration 3. Display of a de-icing/anti-icing process

6. Capacity and Limitations

Capacity restrictions during winter operations can be caused by the necessity for de-icing/anti-icing of aircraft and clearing and/or de-icing of runways and taxiways.

The total number of aircraft de-icing/anti-icing vehicles for the forthcoming winter season is established on the basis of known flight schedules, airport capacity and with due consideration of economic aspects and necessary waiting times. The goal is to provide an aircraft de-icing vehicle availability of at least 85%. For the winter season 2018/2019 a pool of 78 de-icing/anti-icing vehicles is available. The level of operational readiness differs according to actual weather conditions and can be referenced in Appendix G.

For the storage of de-icing/anti-icing fluid tank farms are situated at strategic areas of the airport in order to reduce vehicle driving times for refilling purposes, thus increasing the overall capacity for de-icing/anti-icing of aircraft on the ground. All de-icing vehicles operating under this Frankfurt Aircraft De-icing Plan will **only** be refilled at these tank farms. N*ICE has established a system to reorder de-icing/anti-icing fluid in a timely manner to cover storage capacity.

In case of extreme winter weather conditions resulting in hold over times not likely to be sufficient for safe departure after de-icing/anti-icing of aircraft on ramp positions Fraport will, depending on the overall situation on the ramp, endeavor to provide other ramp areas for de-icing/anti-icing purposes.

When there is demand for aircraft de-icing/anti-icing, N*ICE will, as a first step and in coordination with FRA-Apron Control GmbH and the DFS (Tower), open available de-icing Pads after all necessary preparations have been completed.

For the winter season 2018/2019 the following areas will be available for aircraft de-icing/ anti-icing (see also AIP EDDF AD 2 11 Procedures for the de-icing of Aircraft):

- DP1 and DP2 (DPW), only for departures from RWY 18 with restricted use for departures RWY 07. When RWY 18 is not used there are no restrictions for departures RWY 07.
- TWY N7 - DP3 (orange / blue) and V159 / V161 - DP4 (preferably for departures RWY 07/25 also for departures RWY 18).
- G16 - DP5 (generally for departures of aircraft positioned on the southern ramp and aircraft positioned on the eastern ramp planned for RWY 18).

The de-icing/anti-icing area will be displayed in the partner systems INFOplus, CSA-Tool, N*ICE dispo, FDPS, T-FDPS and RMS, as displayed below.

Priority	De-icing Area	System Display	Radio Frequency
1	DP2	DP2E DP2C, DP2W	126,305 MHz 120,680 MHz
2	DP1	DP1	125,105 MHz
3	V159/V161	DP4	<u>130,430 MHz</u>
4	G16	DP5	<u>122.780 MHz</u>
5	TWY N7	DP3	121,880 MHz

Illustration 4. Display in Partner Systems

7. De-icing/ Anti-icing Procedure

The setting of the aircraft de-icing sequence will be determined according to the pre-departure sequence of the A-CDM process. The following factors will be considered when determining the de-icing/anti-icing sequence and the calculation of the ECZT (Estimated Commencement of De-icing/Anti-icing).

- Local delays at Frankfurt Airport
- Aircraft stand de-icing/anti-icing or remote deicing/anti-icing
- Air Traffic Management System NMOC-Slots = CTOT (Confirmed Time of Takeoff)
- Taxi times
- TSAT
- TOBT
- Time of de-icing request

At best the ECZT is the same as the forecasted time reported by the aircraft operator or ground handling company for "Aircraft Ready" (TOBT).

In case the TOBT target cannot be met due to technical problems or on any other reasons, the aircraft operator shall immediately revise the TOBT accordingly.

The EDIT is not part of the TOBT. For this reason the TOBT should not be changed because of an aircraft de-icing planned at a later time.

The CTOT will be set according to the local traffic situation due to the automatic exchange of information (DPI- Departure Planning Information) with the NMOC. In order to maintain the stability of the pre-departure sequence the aircraft operator should not continue any follow up coordination with the NMOC. Additionally it is no longer necessary to update the EOBT (Estimated Off-Block Time) in the ATC Flight Plan due to the actual local traffic situation.

In Appendix B you will find a graphic display of the de-icing process and the pre-departure sequence.

7.1 Planning the De-icing Process

The following describes the individual process phases for planning the aircraft de-icing and the resulting exchange of information.

7.1.1 Requests for Aircraft De-icing

Every request for de-icing/anti-icing shall be communicated to N*ICE via the communication channels as published in Appendix D. Information concerning the "Callsign" (commercial flight number or ATC Callsign) or current parking stand must be included with the request.

Due to the influence that aircraft de-icing has on the sequencing process it is highly advised to request aircraft de-icing at the latest "TOBT – 40 minutes" which is the time that the TSAT is published.

A de-icing/anti-icing request that is made later than 25 minutes (TOBT < 25min.) before the actual time of TOBT leads to a situation that the concerned flight will be planned according to availability and sequence of available N*ICE resources. This procedure should reduce constant changing of the TSAT and disadvantages for flights that have requested services in a timely manner.

To further enhance communication procedures it is now possible to request de-icing services via ACARS (Aircraft Communications Addressing and Reporting System), if the aircraft operator has the appropriate EDP systems installed and links. Detailed information can be requested from N*ICE.

The de-icing request will be published and displayed in the "CSA-Tool" and "INFOplus" systems as ICE = E (de-icing requested).

All departing flights not larger than Code C aircraft (A321) occupying aircraft stands east of Taxiway N3, and intend to depart RWY 18, shall expect to taxi via TWYs S-East, R-East, R and S and will be de-iced/anti-iced at the aircraft de-icing area G16.

If an aircraft operator requests aircraft de-icing after the aircraft has already received start-up via datalink or radio (A-CDM status "SUG") N*ICE will not accept the request and advise the aircraft operator to send the given start-up back to the DFS-Tower and thereafter repeat the de-icing /anti-icing request.

If an aircraft operator requests services after the aircraft stand has been vacated (A-CDM status "OFB") the de-icing/anti-icing will be decided by the available N*ICE de-icing/anti-icing capacity and will generally

be carried as a position de-icing/anti-icing. When the aircraft operator is given instructions by FRA-Apron Control GmbH to taxi into an aircraft stand (Return to Stand procedure) the A-CDM alarm 10 will be sent to the aircraft operator or ground handling partner and the flight status will be changed to “standby” (SBY).

Example: CDM10 — “TOBT Rejected or Deleted”

XXX1AB/XX123

CDM10

1110151200UTC

MUC/EDDM

TOBT 1300 WAS REJECTED OR DELETED. NEW TOBT REQUIRED.

NOTE: THE AIRPORT CDM PROCESS IS SUSPENDED UNTIL RECEPTION OF YOUR RECTIFICATION

7.1.2 Qualified Pre-Planning (EDIT Prediction)

N*ICE carries out a qualified pre-planning on the basis of the number of de-icings requested. This includes designating where the de-icing will take place and setting the EDIT prediction.

The EDIT will be monitored by N*ICE during all de-icing phases and updated accordingly.

The EDIT prediction depends on the following criteria:

- Type of de-icing request
 - Position
 - Ground time
- Weather situation
- De-icing services ordered
- Aircraft type
- Number of de-icing/anti-icing vehicles used per de-icing request

7.1.3 Designating the Location of de-icing

It is N*ICE's obligation to pre-plan the de-icing location. The aircraft de-icing differs between position and remote de-icing.

Position de-icing/anti-icing:

De-icing/anti-icing is conducted on a terminal or ramp parking position. All hatches must be closed, stairs and/or passenger bridges removed and the position clear of all handling equipment and aircraft engines switched off. (Except for LH special procedure with attached front boarding bridge)

Position de-icing will be published and displayed in the “CSA-Tool” and “INFOplus” systems as ICE = P. Simultaneously the EDIT will also be published and displayed.

Remote de-icing/anti-icing:

De-icing/anti-icing on a DP near a runway or a designated ramp area under the same conditions as a position de-icing except that the aircraft engines shall be running.

Due to operational reasons changes can occur at short notice (e.g. actual traffic situation). The final decision for a specific DP or an apron area is the responsibility of FRA- Apron Control GmbH.

The remote de-icing will be published and displayed in the “CSA-Tool” and “INFOplus” systems as ICE=R (Remote de-icing). Simultaneously the EDIT and the de-icing area (e.g. DP) will be published and displayed (see page 8).

Note: Positions which are equipped with ramp display A-VDGS will display the location where de-icing/anti-icing will be performed.

7.1.4 Monitoring of the Designated De-icing Location

Approximately 25 minutes before TOBT, the pre-planning of a flight with requested de-icing will be monitored. Due to the monitoring, changes may occur.

The following changes are possible:

- Remote de-icing/anti-icing to position de-icing/anti-icing

- Position de-icing/anti-icing to remote de-icing/anti-
- DP or remote area to a different DP or other remote area.

7.1.5 Planning the De-icing Begin

When the de-icing/anti-icing location is designated and the flight has a published TSAT already (A-CDM status "SEQ"), the ECZT will be published by N*ICE and in the systems "CSA-Tool" and "INFOplus" published and displayed.

The ECZT includes the driving time to the given parking position and vehicle preparation.

In the case of remote de-icing an ECZT will generally not be published due to infrastructural and operational factors deemed not to be adequate for proper planning.

7.1.6 Allocation of De-icing/Anti-icing Vehicles

In the case of position de-icing N*ICE allocates the vehicles for a de-icing request according to the A-CDM Pre-departure Sequence and vehicle availability. When the vehicles have been allocated the information will be published and displayed in the "CSA-Tool" and "INFOplus" systems.

The outbound flight receives the A-CDM Status "DVA" (de-icing vehicles allocated).

If it is not possible to fulfil all de-icing requests in a timely manner, due to operational reasons N*ICE shall decide on which aircraft de-icing/anti-icing vehicles will be allocated.

For remote de-icing/anti-icing the number of vehicles is already allocated for the DP's or available remote de-icing areas.

7.1.7 De-icing/Anti-icing Vehicles at the Parking Position

The time at which the allocated vehicles have arrived at a parking position will be published and displayed as a status message in the "CSA-Tool" and "INFOplus" systems.

The departure flight receives the A-CDM status "DVP" (de-icing/anti-icing vehicles on position).

N*ICE will endeavour to have the vehicles 5 minutes before ECZT at the parking position.

7.2 Execution of De-icing/Anti-icing of Aircraft

Following is a description of the process steps for carrying out de-icing/anti-icing processes and the resulting exchange of information.

N*ICE will perform de-icing/anti-icing as described in the latest revision of the "N*ICE Procedures for De-icing/Anti-icing of Aircraft on the Ground" and SAE AS6285 "Aircraft de-icing/Anti-icing Processes".
-/-/-

The "Pilot in Command" (PIC), determines the type and extent of de-icing/anti-icing services. The type and extent of the de-icing/anti-icing influences the EDIT directly and therefore must be updated accordingly.

Once the type and extent of the de-icing/anti-icing has been determined and the de-icing crew is ready to begin de-icing/anti-icing the time will be published and displayed as a status message in the "CSA-Tool" and "INFOplus" systems.

The departure flight then receives the A-CDM Status "DCR" (De-icing Company Ready).

Aircraft taxiing for departure that must be de-iced/anti-iced again due to an expired **HOT** or unexpected freezing precipitation while taxiing shall contact FRA-Apron Control GmbH immediately. Frankfurt Apron will then assign a suitable apron position, where a renewed de-icing/anti-icing process shall be requested through standard procedure and process shall be carried out accordingly.

7.2.1 Delay before de-icing/Anti-icing Begins

Delays can be caused by the aircraft operator, N*ICE or ground handler. Additionally, runway capacity and/or air traffic restrictions may also effect on time performances of departing flights.

Delay by the Aircraft Operator

If the de-icing crew is ready for de-icing/anti-icing and cannot begin the process at time ECZT plus 5 minutes (aircraft not ready) the A-CDM Alarm 40 will be sent to the aircraft operator or ground handler.

Example:

CDM40 — “Aircraft not ready for de-icing”

XXX1AB/XX123

CDM40

1110151200UTC

FRA/EDDF

FLIGHT NOT COMPLIANT WITH TOBT 1300. DE-ICING COULD NOT BE INITIATED. UPDATE OF TOBT NEEDED.

NOTE: THE AIRPORT CDM PROCESS MAY BE SUSPENDED UNTIL RECEPTION OF YOUR NEW TOBT.

After updating the TOBT and receipt of a new ECZT, N*ICE will decide whether the vehicles remain at the aircraft or leave the aircraft stand (later ECZT). If the TOBT is not updated, N*ICE must decide if the vehicles leave the aircraft stand.

If N*ICE decides to remove the vehicles N*ICE will then delete the ECZT. The departure flight status changes to “Standby” (A-CDM “SBY”). The A-CDM Alarm Message [43](#) will then be sent to the aircraft operator or ground handler.

Example:

CDM43 — “De-icing cancelled and TOBT deleted”

XXX1AB/XX123

CDM43

1110151200UTC

FRA/EDDF

AIRCRAFT WAS NOT READY FOR DE-ICING. DE-ICING IS CANCELLED AND TOBT IS DELETED.

FIRST NEW TOBT AND THEN NEW DE-ICING REQUEST REQUIRED.

NOTE: THE AIRPORT CDM PROCESS IS SUSPENDED UNTIL RECEPTION OF YOUR NEW TOBT.

Delay by N*ICE

If the ECZT target cannot be met by N*ICE after the de-icing/anti-icing vehicles have been allocated, N*ICE must decide which possible measures can be taken as follows:

- On time allocation of more de-icing/anti-icing vehicles (meeting the target ECZT),
- Postponement of the estimated de-icing begin (ECZT update),

7.2.2 Begin of de-icing/Anti-icing

The de-icing/anti-icing process can begin up to 5 minutes before or after (10 minute window) ECZT.

When the spraying of an aircraft begins the ACZT (Actual Commencement of de-icing Time) will be automatically set in the de-icing/anti-icing vehicle.

The ACZT will be published and displayed in the “CSA-Tool” and “INFOplus” systems for both position and remote de-icing.

The departure flight then receives the A-CDM status ADB (Actual de-icing Begin).

7.2.3 De-icing/Anti-icing Acceleration or Slow Down

If N*ICE determines during the de-icing/anti-icing process that the given EDIT will deviate more than +/- 5 minutes then N*ICE will update the EDIT accordingly in the “NICEDISPO” system. The EDIT update will then be published and displayed in the “CSA-Tool” and “INFOplus” systems.

7.2.4 End of Aircraft de-icing/Anti-icing

N*ICE will perform the "Post De-icing/Anti-icing Check" and communicate the "Anti-icing Code" accordingly.

After the Anti-icing Code has been given and the de-icing vehicles are clear of the aircraft the de-icing crew will then set the AEZT (Actual End of de-icing Time) in the de-icing/anti-icing vehicle.

The AEZT will be published and displayed in the "CSA-Tool" and "INFOplus" systems for both position and remote de-icing.

The departure flight then receives the status ADE (Actual de-icing End).

In the case of position de-icing/anti-icing the end of de-icing equates to the TSAT.

7.3 Cancellation of Aircraft De-icing/Anti-icing

If an aircraft operator or PIC decides an aircraft de-icing/anti-icing is no longer necessary, then this shall be communicated to N*ICE so that the request for services can be cancelled. N*ICE will then cancel the de-icing/anti-icing request. The cancellation will then be displayed and published in the "CSA-Tool" and "INFOplus" systems as ICE = S (Cancellation of de-icing).

The departure flight will then receive the A-CDM status "NOI" (No de-icing).

Whenever FRA-Apron Control GmbH notices that a flight with requested de-icing does not want to fulfil the de-icing, pilots will be asked to cancel the de-icing request via the communication channels as published in Appendix D.

For flights with a slot regulation, an improvement of the target times is aimed, if de-icing is cancelled. Various external parameters affect the possibility of improvement in the individual case.

8. Start-up and De-icing/Anti-icing

Position de-icing/anti-icing:

When the de-icing/anti-icing is finished and the A-CDM Status ADE is received the PIC shall request "Start-up and Enroute Clearance" from DFS (Frankfurt Delivery) according to the given TSAT.

"REQUEST START-UP AFTER DE-ICING"

Thereafter follow push-back and taxi instructions to the designated RWY as given by FRA-Apron Control GmbH.

Remote de-icing/anti-icing:

Once assigned a DP (R) for de-icing/anti-icing and ready for push-back, the PIC shall request "Start-up and Enroute Clearance" from DFS (Frankfurt Delivery) according to the given TSAT.

"REQUEST START- UP FOR REMOTE DE-ICING"

Thereafter follow push-back and taxi instructions to the DP as given by FRA-Apron Control GmbH.

9. Special Procedure

9.1 NMOC for "Adverse Conditions"

In situations with "Adverse Conditions" it is possible for the DFS (Tower) to take the following measures in relation to the NMOC:

- Timely information about extreme situations to the NMOC Supervisor,
- Increasing the taxi times using the CSA-Tool function "Variable Taxi Times",
- Only for departure flights with a requested de-icing/anti-icing in de-icing/anti-icing situations by extending the Slot Tolerance Window (max. CTOT +30 minutes). The extension is only valid for one hour and thereafter must be coordinated anew,
- Extension of the Slot Tolerance Window for all departure flights (max. CTOT +30 minutes). The extension is only valid for one hour and thereafter must be coordinated anew,
- For any one particular departure flight (e.g. heavy delay) a certain time of take-off (TTOT) can be agreed upon after coordination with the NMOC.

9.2 Irregular Operation Modes

In irregular situations it is possible to activate the following operation modes:

A-CDM Operation Mode “simplified sequencing”

This special operation mode can be activated by N*ICE in case of snowfall or high de-icing demand, whenever a stable pre-planning (allocation of de-icing location) is no longer possible and target times cannot be guaranteed.

A simplified sequencing is used for the short-term planning of de-icing and allocation of a de-icing location for the next hour.

- Start-up procedure according to TSAT is still valid. Start-up clearance via datalink is not possible (check ATIS)
- An aviation world express will inform airlines that the TSAT may be deleted for flights with “De-icing requested”. The information to pilots in this case will be: “You are listed for de-icing, wait for de-icing location”
- Reissue of TSAT as soon as target times for de-icing are available

A-CDM Emergency Mode

This special operation mode can be activated, if the “simplified sequencing” still not enables a stable short-term planning of de-icing.

The special operation mode can also be activated in case of irregular operations (e.g. system disturbance), if target times are no longer valid.

- Start-up procedure according TSAT is still valid. Start-up clearance via datalink is not possible (check ATIS)
- An aviation world express will inform airlines that the TSAT may be deleted for flights with “De-icing requested”. The information to pilots in this case will be: “You are listed for de-icing, wait for de-icing location”
- Reissue of TSAT as soon as target times for de-icing are available

Start-Up procedure according to TSAT is suspended

As last level of escalation the Start-Up procedure according to TSAT can be suspended in case of non-reliability of target times for departure clearance as last level of escalation.

- Pilots request start-up clearance via r/t when actually ready
- Timeframe for start-up clearance will no longer be taken into account
- Pilots reporting ready will get a start-up approval. Apron control will process the flights sequentially
- N*ICE will process the flights sequentially regarding the TOBT
- Start-up clearance via datalink is not possible
- An aviation world express will inform the airlines about the suspension of start-up procedure according to TSAT

9.3 Special Procedure US-Flights

To manage the removal of passenger bridges or passenger stairs for significantly delayed US-departures with de-icing request, this special procedure applies in the following cases:

- During the A-CDM Operation Mode “Simplified Sequencing”
- During the A-CDM Emergency Mode

Within those operation modes, TSAT, target times of de-icing and de-icing location for flights with the A-CDM status “DIR” or “ICE=E” may be deleted. When de-icing target times for the flights are available, the TSAT and the de-icing location are reissued.

The TOBT still needs to be updated in both special operations modes. Therefore, all ground-handling activities need to be completed when the TOBT is reached. Due to the risk of high compensation claims, this special procedure allows to leave the aircraft's doors open after TOBT, if no TSAT and target times of de-icing are published for this specific flight. It is sufficient to leave one door open.

The application of this special procedure is arranged between airline and responsible ground-handler (WISAG or BVD).

10. Special de-icing Services

“Hands on Checks”, “Clear Ice Checks”, “Under wing de-icing”, “Hot Air de-icing” (main and nose gear) or inspections of the center engines cannot be performed on a DP or apron area with engines running and shall be requested at the earliest possible time (see Appendix D).

However, in case of critical holdover times FRA Apron Control GmbH will attempt to assign a ramp area for the performance of these checks, under consideration of all operational and capacity aspects. The PIC shall be responsible for determining compliance concerning aircraft performance, aircraft procedures, company procedures, related manuals and the assessment of and adherence to the correct holdover times.

Propeller driven aircraft cannot be de-iced/anti-iced on a DP or ramp area with propellers running.

“Post de-icing/Anti-icing Check” on a DP or ramp area can only be performed visually, so that nobody is endangered by walking close to hazardous areas around an aircraft with running engines. This check is therefore limited to surfaces that can be visually inspected properly (aircraft upper aerodynamic surfaces, fuselage).

11. Fan Blade De-icing

The aircraft operator must be aware that fan blade de-icing is not an integral part of the aircraft de-icing/anti-icing process. Fan blade de-icing must be requested separately from Fraport AG Ground Services and cannot be performed on a DP or ramp area. The aircraft operator must take into consideration the duration of the process and shall revise the TOBT accordingly.

Aircraft de-icing/anti-icing shall be carried out after fan blade de-icing is completed.

12. Quality Assurance and Control

Before and during the annual winter season N*ICE as provider of de-icing/anti-icing of aircraft on the ground and as an entity involved with the Aircraft de-icing Plan shall be audited in regular intervals by neutral, binding and common quality checks in order to ensure safety and the highest possible quality to be extended to the aircraft operators. This shall include the ADF tank farms and the ADF stored therein. In more detail, this audit shall be comprised of - but is not limited to - the following items:

- Personnel (training according to actual SAE-Standards, comprehension, authorization, supervision, responsibilities, training records, etc.),
- Standards and procedures (availability, comprehension, application),
- ADF (approval, storage, maintenance, documentation, mixtures applied, viscosity checks performed),
- De-icing/anti-icing vehicles and ADF tank farms (maintenance according to given regulations, suitability for fluids used).

All such audits shall be performed according the procedures as per SAE standards which is the standard for “N*ICE Quality Assurance Procedures for Aircraft de-icing/Anti-icing Fluids” and “N*ICE Procedures for de-icing/Anti-icing of Aeroplanes on the Ground”.

In case of any deviation pertaining to the compliance of rules or guidelines as written in Chapter 3 appropriate steps will be immediately taken by N*ICE to re-establish compliance with all rules and guidelines.

In case of disruptions to N*ICE operations or on request of any one or multiple entities involved N*ICE shall initiate a “Quality Control Meeting” with the goal being to critically review and evaluate the preceding de-icing/anti-icing operation, examination of adherence to the established operating procedure or any deviations thereof. Any deviations and their justification will be analyzed and input or complaints from any one aircraft operator shall be considered.

The review's goal is to make possible improvements to the established procedures and harmonisation thereof when possible and/or necessary with the results being published by N*ICE.

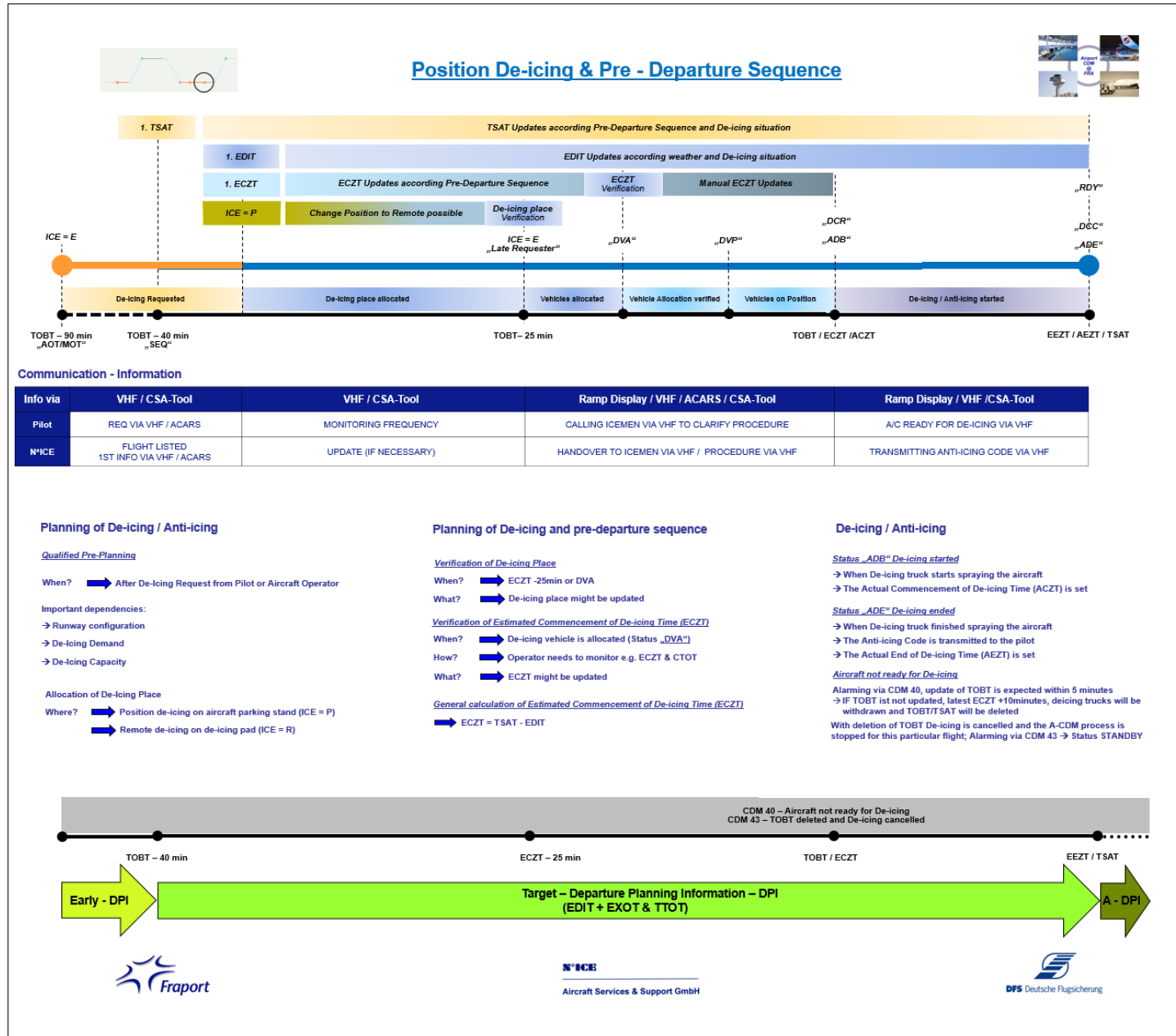
13. Appendix A - Glossary

Abbreviations and Definitions used in the Frankfurt Aircraft de-icing Plan

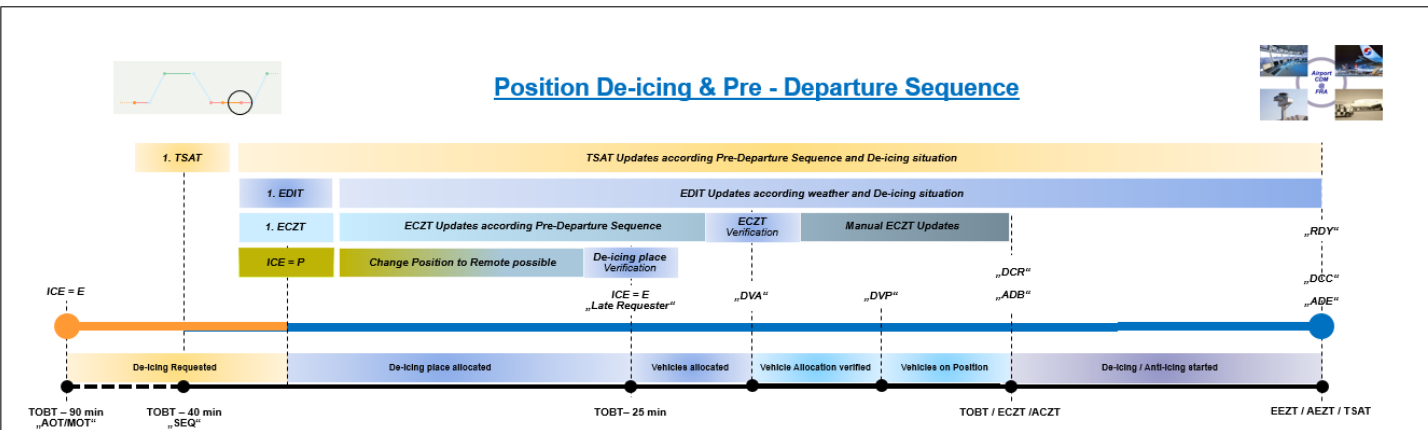
ARR	Arrival
ACARS	Aircraft Communications Addressing and Reporting System
A-CDM	Airport Collaborative Decision Making
ADC	Aircraft de-icing Center
ADF	Aircraft De-icing/Anti-icing Fluid
AIP	Aeronautical Information Publication
Anti-icing	Application of ADF onto clean aircraft surfaces (after de-icing) to prevent deposition of snow, ice or hoarfrost
AOBT	Actual Off-Block time
AOC	Airline Operators Committee
ACZT	Actual Commencement of de-icing Time
ARP	Aerospace - Recommended Practice
ATC	Air Traffic Control
ATC Callsign	Air Traffic Control Callsign for a flight as filed in the flight plan, for ATC purposes only
ATIS	Automatic Terminal Information System
A-VDGS	Advanced Visual Docking and Guidance System (Ramp display)
AWE	Aviation World Express
BECMG	Becoming
Brand-name	Table Hold-over time table for a specific type of approved ADF of a specific brand (manufacturer)
CTOT	Calculated Take Off Time for ATC purposes
CSA-Tool	Common Situational Awareness Tool
De-icing	Procedure by which frost, ice, slush or snow is removed from an aircraft in order to provide clean surfaces (note: the Aircraft de-icing Plan mostly refers to „de-icing“ as the combination of de-icing and Anti-icing)
DEP	Departure
DFS	Deutsche Flugsicherung GmbH (German Air Traffic Control)
DP	De-icing Pad
DPW	De-icing Pads DP1 and DP2
DWD	Deutscher Wetterdienst (German Meteorological Services)
ECZT	Estimated Commencement of de-icing Time
EDIT	Estimated de-icing Time
EEZT	Estimated End of de-icing Time
EOBT	Estimated Off Block Time for ATC purposes
ETOT	Estimated Take-Off Time
EXOT	Estimated Taxi-Out Time
Fraport AG	Frankfurt Airport Services Worldwide (Airport Operator)
Generic Tables	Hold-Over Time Tables released by FAA for Anti-icing fluids. These tables are not specific for any manufacturer or brand-name
HCC	Hub Control Center
HOT	Holdover Time
Holdover Time	Estimated time for which an Anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the protected surfaces of an aircraft, under specific weather conditions as defined in the hold-over time tables.
IMC	Instrument Meteorological Conditions

ISO	International Standards Organisation
LHO	Living Human Organs
MHz	Megahertz
MTOW	Maximum Take Off Weight
n/a	not available
NMOC	Network Manager Operations Center- (Central Flow Management Unit von EUROCONTROL)
OAT	Outside <u>Air</u> Temperature
P	Position de-icing/anti-icing on the aircraft gate/ramp position
PIC	Pilot in Command
PROB	Probability
R	Remote de-icing/anti-icing on a De-icing Pad
RWY	Runway
SAE	Society of Automotive Engineers
SV NMOC	Supervisor Central Flow Management Unit
TEMPO	Temporary
TOBT	Target Off-Block Time
TSAT	Target Start-up Approval Time
TWR	Tower
VHF	Very High Frequency
VMC	Visual Meteorological Conditions

14. Appendix B – A-CDM Process Poster



Position De-icing & Pre - Departure Sequence



Communication - Information

Info via	VHF / CSA-Tool	VHF / CSA-Tool	Ramp Display / VHF / ACARS / CSA-Tool	Ramp Display / VHF / CSA-Tool
Pilot	REQ VIA VHF / ACARS	MONITORING FREQUENCY	CALLING ICEMEN VIA VHF TO CLARIFY PROCEDURE	A/C READY FOR DE-ICING VIA VHF
N°ICE	FLIGHT LISTED 1ST INFO VIA VHF / ACARS	UPDATE (IF NECESSARY)	HANDOVER TO ICEMEN VIA VHF / PROCEDURE VIA VHF	TRANSMITTING ANTI-ICING CODE VIA VHF

Planning of De-icing / Anti-icing

- Qualified Pre-Planning
- When? ➡ After De-icing Request from Pilot or Aircraft Operator
- Important dependencies:
 → Runway configuration
 → De-icing Demand
 → De-icing Capacity
- Allocation of De-icing Place
- Where? ➡ Position de-icing on aircraft parking stand (ICE = P)
 ➡ Remote de-icing on de-icing pad (ICE = R)

Planning of De-icing and pre-departure sequence

- Verification of De-icing Place
- When? ➡ ECZT -25min or DVA
 What? ➡ De-icing place might be updated
- Verification of Estimated Commencement of De-icing Time (ECZT)
- When? ➡ De-icing vehicle is allocated (Status „DVA“)
 How? ➡ Operator needs to monitor e.g. ECZT & CTOT
 What? ➡ ECZT might be updated
- General calculation of Estimated Commencement of De-icing Time (ECZT)
- ➡ ECZT = TSAT - EDIT

De-icing / Anti-icing

- Status „ADB“ De-icing started
- When De-icing truck starts spraying the aircraft
 → The Actual Commencement of De-icing Time (ACZT) is set
- Status „ADE“ De-icing ended
- When De-icing truck finished spraying the aircraft
 → The Anti-icing Code is transmitted to the pilot
 → The Actual End of De-icing Time (AEZT) is set
- Aircraft not ready for De-icing
- Alarming via CDM 40, update of TOBT is expected within 5 minutes
 → IF TOBT ist not updated, latest ECZT +10minutes, deicing trucks will be withdrawn and TOBT/TSAT will be deleted
 With deletion of TOBT De-icing is cancelled and the A-CDM process is stopped for this particular flight; Alarming via CDM 43 → Status STANDBY



15. Appendix C – Operational Benchmarks

A/C Category	1 Step			2 Step		
	Fluid amount used in liters	Ø Duration in minutes (EDIT)		Fluid amount used in liters	Ø Duration in minutes (EDIT)	
	Anti-icing	Remote	Position	Anti-icing	Remote	Position
A all types < 5,7 MTOW	250	10	11	200	13	14
B AT42/72, B461/2/3, CRJ1 - CRJ9, DH8A/B/C/D, E135 to E195, F50, RJ1H, RJ70, RJ85 and similar size	310	10	11	220	22	24
C A318 to A321, B727, B737, DC9, F70, F100, MD80, MD90, YK42 and similar size	370	11	13	280	23	25
D A310, B757, DC8, T154 and similar size	530	13	14	420	24	26
E A300, B767, IL76, IL86 and similar size	730	13	14	530	28	31
F A330, A342/3, B772, DC10, IL96, MD11 and similar size	840	14	15	660	22	24
G A346, B747, B773 and similar size	1010	16	18	770	30	32
H A380 and similar size	2300	18	19	1300	43	47

Please be advised that no responsibility is taken for the accuracy of the information provided above. The de/anti-icing duration times and fluid amounts used merely reflect empirical averages of the last years and do not take into consideration varying weather, contamination, precipitation and temperature conditions. For operational processes it is necessary to use the specific duration of de-icing/anti-icing time (EDIT). The data used has been provided by N*ICE and based on statistical averages for past years of operation. The duration of de-icing/anti-icing is based on the used procedure, preparation time, de-icing/anti-icing area and the weather situation.

Notice: de-icing process: Preparation time (position = 20 min. remote de-icing = 10 min.) + duration (EDIT)

16. Appendix D – de-icing/Anti-icing Service Request

For Aircraft de-icing/Anti-icing Service requests at Frankfurt Airport please contact:

**VHF: 122.305 MHz „Frankfurt de-icing“
or
Telephone: (0 69) 6 90 - 3 02 32**

Requests per telephone only as a last resort

Requests for de-icing can also be made utilising **ACARS**, if the aircraft operator is equipped with the required EDP systems and connectivity is available.

After submission of the request for de-icing/Anti-icing the flight crews shall monitor the related radio frequency and follow instructions given. The communication procedure for de-icing services is described in Appendix E.

Special situations shall be communicated as soon as possible when known.

Note: From May 1st until October 14th of every year requests for aircraft de-icing/anti-icing services can only be made via telephone number +49 069 690 30232.

Requests via VHF or ACARS during this time frame will not be processed.

17. Appendix E - Communication Procedure for de-icing/Anti-icing of Aircraft on DPs.

Aircraft	N*ICE/ ADC	Remarks
(Callsign), request de-icing	(Callsign), you're listed for de-icing, please monitor this frequency	When an aircraft is serviced on a remote-deicing position, the communication between PIC and provider is conducted via VHF-Frequency.
(Callsign), monitor frequency		
	(Callsign), de-icing will take place on remote-de-icing Pad xxx, for Start-up according TSAT contact Delivery on Freq. 121.905	
(Callsign), contact delivery on Freq. 121.905		
Aircraft	FRA Delivery	Remarks
FRA Delivery, (Callsign), request start up for remote de-icing.	(Callsign), start up approved to destination (x), cleared to destination (x), via SID and flight plan route, squawk (x). Contact Apron on frequency (x).	
Aircraft	FRA Apron	Remarks
FRA Apron, (Callsign), request push back for remote de-icing on de-icing Pad (x).	(Callsign), your push back is approved.	
FRA Apron (Callsign), request taxi for de-icing at de-icing Pad (x).	(Callsign), taxi to de-icing Pad (x), via TWY (x).	FRA Apron will give further instructions
Aircraft	Icehouse	Remarks
Iceman de-icing Pad (x), (Callsign) on de-icing Pad.	(Callsign), set parking brake. Please advise when aircraft is configured and ready for de-icing	After the Aircraft is positioned at the de-icing Pad
(Callsign), parking brake set. Aircraft configured for de-icing.	(Callsign), advise treatment (de-icing/anti-icing procedure) required and the coldest known tank-temperature	
(Callsign), coldest known tank-temperature is xxx, request (type of de/anti-icing and areas to be treated) or coldest known tank-temperature is xxx, suggest a proper treatment (de-icing/anti-icing procedure)	(Callsign), Process confirmed, we start de-icing/anti-icing now or recommend treatment xxx (de-icing/anti-icing procedure)	a)
(Callsign), affirm procedure (de-icing/anti-icing)	(Callsign), we start de-icing/anti-icing now	b)
	(Callsign), aircraft areas (xxx) anti-iced with type (x), (x) %, "brand-name", at hh:mm lt, post de-icing/Anti-icing Check complete. Vehicles are removed and clear, recontact Apron.	After de-icing/anti-icing completed and vehicles in safe position contact Apron Control. Aircraft shall wait for "all clear" signal.
Aircraft	FRA Apron	Remarks
FRA Apron, (Callsign) on de-icing Pad (x), ready to taxi.		FRA Apron will give further instructions.

Caution: Due to jet blast exposure to the de-icing/anti-icing vehicles and teams only minimum power shall be used for aircraft movements onto and off the de-icing Pads.

18. Appendix F - Communication Procedure for de-icing/Anti-icing of Aircraft on Aircraft Parking Stands

Aircraft	N*ICE/ ADC	Remarks
(Callsign), request de-icing	<i>(Callsign), you're listed for de-icing, please monitor this frequency</i>	When an aircraft is serviced on an aircraft position the communication between PIC and provider is conducted via VHF-Frequency
(Callsign), monitor frequency	<i>(Callsign), de-icing will take place on your current parking-stand. Contact Iceman on Frequency (xx) for further Info</i>	
<i>(Callsign), affirm, will contact Iceman on Frequency (xx).</i>		
Aircraft	N*ICE/ Iceman	Remarks
<i>(Callsign), on parking-stand xxx</i>	<i>(Callsign), advise treatment (de-icing/anti-icing procedure) required and the coldest known tank-temperature</i>	
<i>(Callsign), coldest known tank-temperature is xxx, request (type of de-icing/anti-icing and areas to be treated) or coldest known tank-temperature is xxx, suggest a proper treatment (de-icing/anti-icing procedure)</i>	<i>(Callsign), Process confirmed, please advise when aircraft is configured and ready for de-icing or recommend treatment xxx (de-icing/anti-icing procedure)</i>	a)
<i>(Callsign), affirm procedure (de-icing/anti-icing)</i>	<i>(Callsign), affirm, please advise when aircraft is configured and ready for de-icing</i>	b)
<i>(Callsign), aircraft configured and ready for de-icing</i>	<i>(Callsign), affirmative we will start Process (xxx) accordingly</i>	
	<i>(Callsign), aircraft areas (xxx) anti-iced with type (x), (x) %, "brand-name", at hh:mm It, post de-icing/Anti-icing Check complete. Please contact Delivery on frequency (x).</i>	
<i>(Callsign), affirm</i>		
Aircraft	FRA Delivery	Remarks
<i>FRA Delivery (Callsign), request Start-Up after de-icing.</i>	<i>(Callsign), start-up approved to destination (x), squawk (x). Contact Apron on frequency (x).</i>	The PIC shall request Start-up after the de-icing/anti-icing process has been completed
Aircraft	FRA Apron	Remarks
<i>FRA Apron (Callsign), request Push-back/ taxi</i>	<i>(Callsign), Push-back / taxi is approved</i>	

19. Appendix G - Provider's Capacity Allocation Matrix

Ops Category	Operational Phase	Vehicles on Position	Vehicles on DPs	Vehicles Total	Open DPs	Remarks
0.	Basic contingency	2	0	2	-	OAT \geq +3°C or higher
1.	Pre de-icing	2-14	0	up to 14	-	No precipitation – OAT +1°C or lower, additionally in agreement with HCC; hoarfrost buildup overnight on aircraft possible – concerns departures until 08:00 LT
2.	Frost	2-16	4-12	up to 28	DP1 and DP2 (Alternative DP2 + DP5)	OAT +0°C or lower all day, cloudless weather, low to middle humidity hoarfrost buildup on aircraft possible (possible necessity for de-icing/anti-icing of long haul flights)
3.	Small contingency	up to 24	8-16	up to 40	DP1 and DP2 DP3 or DP5 if needed due to actual day's weather	Weather conditions such as frost (category 2) OAT $>$ + 0°C precipitation (SNRA, RASN,SG, FZFG) probability \geq 10% to 29% high humidity frost and ice buildup on aircraft probable
4.	50% contingency	up to 36	12-24	up to 60	DP1 and DP2, DP3 and DP5 DP4 if needed due to actual day's weather	Any kind of precipitation (SN/FZFG/FZRA) \geq 30% to 59% probability (or PROB30 in last TAF)
5.	100% contingency	up to 48	24	up to 70	DP1 and DP2, DP3 DP4, DP5	Any kind of precipitation (SN/FZFG/FZRA) \geq 60% to 90% probability (or PROB40 in last TAF)

20. Appendix H - General DP Allocation Plan

DP Allocation						
Maximum aircraft size assigned to a remote area or DP according to aircraft type: Code C (max. A321), Code E with 2 engines (max B77W), Code E (Max B744), Code F (max. A380)						
DPW (DP-West)				Other de-icing areas		
DP1	DP2 (DP2E, DP2C und DP2W)			aircraft taxi out with engines running		
	E = East Lane	C = Center Lane	W= West Lane	N7 (DP3)	V159 / V161 (DP4)	G16 (DP5)
F	C	F	C	C	E (with 2 engines)	E

Note:

- The DP Designator in parenthesis will be displayed in systems N*ICE dispo, INFOplus and CSA-Tool accordingly.
- DP-West (DPW) includes DP1 und DP2 (see page 8).
- Location of the de-icing areas can also be found in AIP EDDF AD2 2-5.