



Aircraft Deicing/Anti-Icing Regulations



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Contents



- “Aircraft Deicing/Anti-Icing” – What is it ?
- What is the Legal Status ?
- Highest Authority – Do we have one ?
- Which NAA’s are playing a role ?
- Standardization – Whom to listen ?
- Non-Profit-Organizations – Important ?
- Summary

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"Aircraft Deicing/Anti-icing" – What is it ? (I)



- It is an integral part of the aircraft release, containing two separate sections:
 - The deicing, which is the removal of contamination from the aircraft surfaces (using fluids, mechanical means, infrared, etc.).
 - The anti-icing representing the protection of the aircraft against the reformation of contamination for a limited period of time (only possible with special designed fluids).

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"Aircraft Deicing/Anti-icing" – What is it ? (II)



- The statistics shows that the thematic “Ground Icing / Ground Deicing/Anti-Icing” is the second most cause for aircraft accidents and incidents in the commercial aviation.

Since starting precise records in the 60’s, more than 30 aircraft had been lost, killing more than 500 people worldwide.

- Accidents are mainly caused by two reasons:
 - Improper training of the involved staff, and
 - missing or wrong procedures.

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"Aircraft Deicing/Anti-icing" – What is it ? (III)



- Looking on the incidents we have a dramatic increase in the last years, caused by two major reasons:
 - The change of the legal status of the deicing/anti-icing, which will be explained later, and
 - the dramatic increase of flight control problems, caused by residues of deicing/anti-icing fluids.



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What is the legal status ? (I)

- The different steps of the deicing/anti-icing process on the ground are given in the IATA SGHA 3.17., which should be the basis for all ramp handling contracts.
- Till the year 1998, this section had five paragraphs:
 - 3.17.1.: Manual Snow Removal
 - 3.17.2.: Provision of Equipment
 - 3.17.3.: Provision of Fluids
 - 3.17.4.: Deicing
 - 3.17.5.: Anti-icing

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What is the legal status ? (II)



- Being part of this document says that the status is from a legal point of view “servicing”.
This means that maintenance regulations did not apply for this part of the job.
- But for the final steps of the process, the “supervision” as well as the “final release check” (now “post anti-icing check”) maintenance staff had been responsible.
This required that training had to be structured fully in line with the respective regulations of JAA JAR 145 (Maintenance) and JAA JAR 66 (Training).



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What is the legal status ? (III)

- In 1998 the SGHA had been revised and in section 3.17. two more paragraphs had been added:
 - 3.17.6.: Supervision
 - 3.17.7.: Final Release Check
- This change led to the fact that maintenance is now no longer responsible for any part of the deicing/anti-icing on the ground process.
And unfortunately the result is a dramatic decrease in staff quality / education and this brings a dramatic increase in incidents based on human factors.



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What is the legal status ? (IV)

- Statistics show that before 1998 we had an incident rate of less than 1,0 per 100 flights and we have a rate of around 2,7 per 100 flights.
- And because of the economic pressure, more and more airlines will stop using certified technicians for this job.



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Highest Authority – Do we have one ?” (I)

- In respect to worldwide acceptance, we would need a “Aircraft Deicing/Anti-Icing on the Ground Manual” issued by the ICAO.
This document should be revised on a regular basis and could be used as the basis for company procedures as well as technical standards.
- As the ICAO is the only worldwide recognized body, we would have the advantage of a general recognized and accepted document.



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Highest Authority – Do we have one ?” (II)

- The ICAO published in 1995 with document number 9640-AN/940 the “Manual of Aircraft Ground De-Icing/Anti-icing Operations”.

A revision of this publication had been issued in 2000 to reflect the changes in the industry.

- The document stays very general and due to it’s slow revision schedule of 5 years or longer, no new developments are included.

Therefore, this industry does not have a single source of information.

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Which NAA's are playing a role ?" (I)



- In principal, all civil aviation authorities should be involved, issuing regulations for the airlines operating under their legal umbrella.
- But the reality is that only a few countries are willing to work on this subject and also spend money for research and development.
- We even have the problem that the authorities of some countries deny the acceptance of international standards for fluids, equipment and tools and create own specifications.



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Which NAA's are playing a role ?" (II)

- Most active are FAA (USA) and TC (Canada), sending staff in all different international committee's & organizations, and additionally providing financial support for new research projects and technologies (e.g. fluids, infrared, forced air and so on).
- We are still missing a full harmonization between these two bodies, but in the most important subjects we have an agreement with them.

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Which NAA's are playing a role ?" (III)



- The LBA (Germany) approached the thematic in a total different way and declared in 2004 the “AEA Recommendations for Deicing/Anti-Icing of Aircraft on the Ground” and the “AEA Training Recommendations and Background Information for Deicing/Anti-Icing of Aircraft on the Ground” as mandatory for all airlines with a JAA JAR OPS 1 Certificate, issued by the German Ministry of Transport.
- With this includes all companies worldwide handling aircraft registered in Germany.



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Which NAA's are playing a role ?" (IV)

- The JAA (now renamed in EASA) issued one mandatory document with the number ACJ 1.345, which has a mandatory status.
- But one problem occurs, when we talk about the EASA:
Any NAA, member of the EASA, can issue a deviation of this document and issue different ruling ("Alternate Means of Compliance").
And this leads again to a not harmonized situation.



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Which NAA's are playing a role ?" (V)

- All other NAA's are not really active or even give the impression of absolute ignorance.
- It seems that in some cases a cooperation is not wished to protect own influence.

With other authorities it is simply the lack of funds and equipment to be more active, even the willingness is great.



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Standardization – Whom to listen ? (I)

- The ISO would be the natural choice for creating standards and once they issued some documents:
 - ISO 11075:1992: Type I (non-thickened) Fluids
 - ISO 11076:2000: Procedures and Methods
 - ISO 11077:1992: Self-Propelled Equipment
 - ISO 11078:1992: Type II (thickened) Fluids
- The documents are so outdated that they should not be referenced anywhere. The usage is even dangerous, as new development are not included.

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Standardization – Whom to listen ? (II)



- At the moment the only organization really working on a continuous basis on specifications in the field of aircraft deicing/anti-icing on the ground is the SAE.
A special committee, the G12, is dedicated only to this subject and it includes experts from all areas:
 - Authorities and International Organizations
 - Airlines, Airports and Handling Agents
 - Military
 - Manufacturers

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Standardization – Whom to listen ? (III)



- The SAE G12 created 8 sub-committee's:
 - Fluids
 - Hold-Over-Time
 - Procedures and Methods
 - Equipment
 - Facilities
 - Training and Quality Assurance
 - Ice Detection
 - Future Technologies



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Standardization – Whom to listen ? (IV)

- In the last 15 years the SAE G12 created a lot of standards and keep them up-to-date:
 - AMS 1424: Type I (non thickened) Fluids
 - AMS 1428: Type II/III/IV (thickened) Fluids
 - ARP 1971: Self-Propelled Vehicles
 - ARP 4737: Procedures and Methods
 - ARP 4902: Aircraft Deicing Facilities
 - ARP 5149: Training Recommendations
- These are just examples of more than 25 documents.

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Standardization – Whom to listen ? (V)



- Due to the fact that all interest groups are represented in the SAE G12, the acceptance of the documents became nearly worldwide and most aviation authorities have accepted them without changes.

Unfortunately, the Russian federation do not accept them without changes or in some cases even do not recognize them at all.

But also other countries (e.g. the Peoples Republic of China) still do additional qualification processes.



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Standardization – Whom to listen ? (VI)

- It is a strong recommendation that SAE Standards are accepted worldwide, for two major reasons:
 - They are kept up-to-date at all times and will always reflect the latest technologies, and
 - they are accepted by the aviation authorities, as they are being a member and would have the right to give a veto.

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Non-Profit-Organizations - Important ? (I)



- Looking around in the industry, we have beside the SAE only one more organization of importance and this is the AEA.
- They had been the first ones (in 1982) working on the problem area, after a fatal crash in the USA (Air Florida B737-200 in Washington D.C., the so called “Potomac Disaster”).
- Since this time, they publish now two documents with an annual revision:

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Non-Profit-Organizations - Important ? (II)



- AEA Recommendations for the Deicing/Anti-Icing of Aircraft on the Ground (latest Edition: 21 / 09.2006):
The document gives for all involved companies a guidance for the operation, development of documentation, training and quality control.
It is not a stand-alone document, it uses the SAE Standards as basis for fluids, equipment, basic operational subjects, facilities and so on.
It additionally covers some areas not fully recognized by the SAE at the moment (e.g. residues, etc.).

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Non-Profit-Organizations - Important ? (III)



- AEA Training Recommendations and Background Information for Deicing/Anti-Icing of Aircraft on the Ground:

This is a guideline for the development of company training system (manual, tests, contents, qualifications and so on).

Additionally it is at the moment the best source for any kind of background information. This allows companies to gain additional knowledge and experience.

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Summary (I)



- Aircraft Deicing/Anti-Icing is a subject in civil aviation with an extreme high incident and accident rate.
- Irrespective of this, the legal status had been changed from “maintenance” to “servicing”, leading to a dramatic decrease in qualification and safety and this resulting in more incidents.
- We have no overhaul document, as ICAO, IATA, ISO and other organizations are not able to provide on-time revisions.

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Summary (II)



- FAA and TC are working close together, supporting non-profit-organizations and clearly supporting the introduction of common standards.

Other NAA's are not working on this subject or even creating problems by introducing own requirements and tests.

- SAE and AEA, as the only active organizations providing up-to-date standards and documents should be clearly supported.

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THANK YOU



Aircraft Deicing/Anti-Icing Auditing



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Contents



- Introduction
- Why we are performing audits ?
- Who is performing audits ?
- Checklist – Companies performing the treatment
- Checklist – Companies performing the checks
- Checklist – Companies producing fluids
- Summary

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Introduction (I)



- The aircraft deicing/anti-icing on the ground is one process of the aircraft usage dramatically influencing the safety of the airline operation.
- We are talking about the second most cause for accidents and incidents in the commercial civil aviation.
- Changes in the legal status of the task and the problematic economic situation of most airlines have led to a quality reduction; increasing the rate of incidents.

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Introduction (II)



- As the NAA's are not acting to correct this situation, the airlines started their own initiatives to improve the quality of services.
- This presentation should give an overview about these activities and how audited companies should prepare and react.

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Why we are performing audits (I)



- The civil aviation distinguishes between different ways of quality control accomplishment:
 - Inspection: Verifying the condition and function of a part of system in reference to a described function.
 - Check: Actual verification of a process to see the way of performance and the comparison with a defined standard.
 - Audit: verification of a system at a specific moment, but not the actual accomplishment.

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Why we are performing audits (II)



- An audit should enable an airline, authority, agent and so on to verify the compliance of a process, system or operation to the standard set.

It is not the watching of an actual deicing, it is the verification that the people doing the job are trained, the vehicles are in proper condition and the fluids are certified and passing the quality requirements.

- The audit is not only done to find problems and failures. It should be an act of cooperation to improve the work to an acceptable and safe level.



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Who is performing audits (I)

- Audits are not only the job of airlines to verify the quality work of their contract partners, e.g. airports, service providers and so on.
- Auditing should be a chain of standard verification, not limited to the last step of a cooperation and work chain.

To explain this more detailed, a tree of dependences should be shown, with the responsibilities clearly defined and the purpose of the audit.

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Who is performing audits (II)



- Airline auditing the Service Provider (Airport, Airline, Agent, etc.).

You will check the fluid quality, the training, procedures, equipment, quality system and so on. This will enable the airline to decide, if the services of this company can be accepted or not.

8 European airlines formed in 1997/1998 a pool (DAQCP) to standardize the way of auditing and reduce the work load. This pool has now more than 40 members and operates worldwide.



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Who is performing audits (III)

- Service Provider auditing Suppliers (Fluid Manufacturers, Truck Producers, etc.).

You will verify that the processes used is in line with the standards for production, the service level contract signed and that the company will be able to perform the requirements through a complete season.

There is no legal requirement for such audits, but it is a strong recommendation to perform them before you start using services from a company or after a certain period of cooperation.



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Who is performing audits (IV)

- Suppliers auditing Suppliers (Glycol Producers, Nozzle Providers, etc.).

Similar to the page before you will verify that the services provided to you will be constant and will allow you to fulfill the requirements of your customers.

Again, there is no legal requirement for such audits, but it is a strong recommendation to perform them on a regular basis.

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CL – Companies performing the treatment (I)



- The checklist now shown is an example for a protocol, which can be used by an airline to audit a company performing the actual deicing/anti-icing treatment of an aircraft (ICAO SGHA 13.7.1. to 13.7.6.).
- This checklist had been developed by our company to support customers by establishing a deicing/anti-icing system in line with airline requirements.
- Passing this checklist with a positive result will also give a positive result during a DAQCP audit. A

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CL – Companies performing the checks (I)



- The checklist now shown is an example for a protocol, which can be used by an airline to audit a company performing the final release check (now post anti-icing check) of an aircraft (ICAO SGHA 13.7.7.).
- This checklist had been developed by our company to support customers by establishing a deicing/anti-icing system in line with airline requirements.
- Passing this checklist with a positive result will also give a positive result during a DAQCP audit. B

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CL – Companies producing fluids (I)



- The checklist now shown is an example for a protocol, which can be used by a service provider to audit a manufacturer providing aircraft deicing/anti-icing fluids to your company.
- This checklist had been developed by our company on request of several airlines and service providers for a usable tool to guarantee correct services.
- Passing this checklist will be a very good indication that this company is able to service you a complete season without problems. C

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Summary



- Auditing is an essential tool to verify the compliance of a supplier (services, products, etc.) with your company requirements.
- Standardized protocols are required to easily compile the data and have the possibility to compare data between different companies.
- Audits should be not restricted to airlines, the complete service chain is important.

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THANK YOU