

Cold Temperature Compensation

Operations Briefing

Presented to: Air Traffic Organization

By: Terminal Procedures & Air Traffic Training Requirements

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Federal Aviation
Administration



Introduction

Routinely pilots must make corrections to adjust for nonstandard conditions. Typically ATC is aware of those corrections, however there does exist rare occasions when ATC may not be fully aware pilots are applying corrections. Cold Temperature Compensation is such a case.

Effective January 8, 2015, in accordance with AIM 7-2-3, pilots will be required to report to ATC if they intend to apply Cold Temperature Compensation.

Though **USUALLY no additional action is required by Air Traffic Controllers, being aware will help to reduce risk in the NAS.**



Cold Temperature Compensation

Did you know pilots correct for cold air temperatures?

Cold temperature compensation has been in place for many years and typically applied in the final approach segment.

Did you know pilots were not previously required to inform Air Traffic Control (ATC) of this correction?

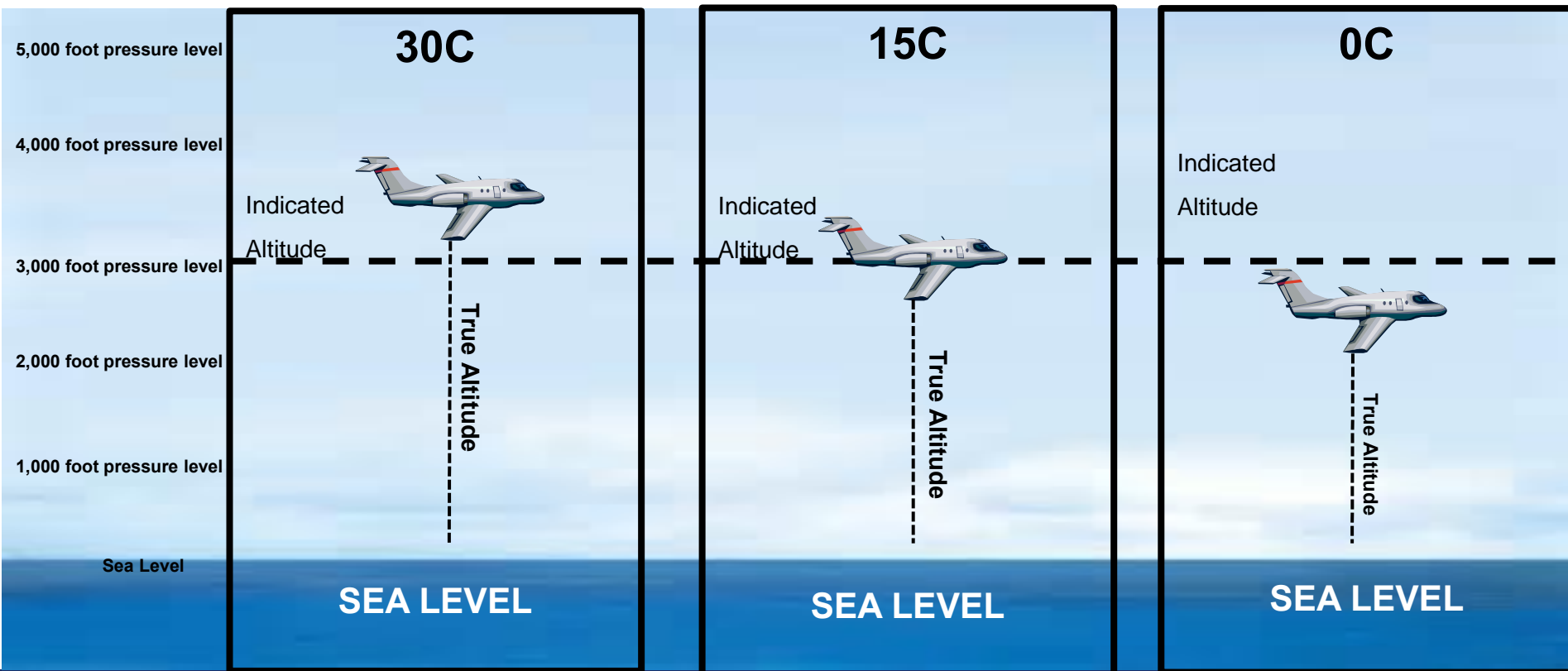
The Aeronautical Information Manual (AIM) states pilots “ .may wish to compensate ” However there is no specific requirement for pilots to coordinate with ATC.

When a pilot applies Cold Temperature Compensation, the aircraft could potentially be hundreds of feet higher than ATC is aware.



Nonstandard Temperature and Altimeter Interpretation

Notice below how decreasing temperature impacts the aircraft's true altitude versus that of the aircraft's indicated altitude. The Flight Standards Service (AFS) is conveying to pilots the importance of altitude compensation during extreme cold temperatures on Standard Instrument Approach Procedures where required obstacle clearance (ROC) could be compromised



The Study

Cold Temperature Compensation

Flight Standards (AFS) commissioned a study to look at instrument approach procedures in the 50 states for runways greater than 2500 feet in length and identify those approaches at risk of compromised required obstacle clearance (ROC) during extreme cold temperatures.

A study was conducted by the MITRE Corp to determine the effects temperature compensation would cause within the NAS.

17,613 procedures at 3012 airports were analyzed.

283 airports were identified as needing cold temperature restrictions.

(84 airports are located in the state of Alaska)



ATC Awareness and Responsibilities

Cold Temperature Compensations

- Cold Temperature Compensation is solely a pilot responsibility.
- The pilot must advise ATC of the need to compensate and provide the amount of compensation that will be applied, except when in the final approach segment. **It is still the responsibility of ATC to account for the amount of compensation as it relates to the separation of other aircraft.**

Reference - 7110.65 Para 5-5-4 Minima; and Para 5-5-5 Vertical Application
- Expect pilots to advise of the need to compensate on approach procedures, and when applicable, the published missed approach segment. Aircraft not flying the published missed segment are not authorized to apply Cold Temperature Compensation when being vectored.



ATC Awareness and Responsibilities

Cold Temperature Compensation

- **ATC must not disapprove a compensation request when it relates to an approach procedure, as it is considered a safety of flight issue.**
- **ATC certainly may delay the compensating aircraft due to other aircraft when there is no other alternative available.**
- **ATC may deny requests to compensate only during the phase of flight where obstacle clearances are not a concern; for example, when aircraft are NOT operating at a minimum altitude, such as the MVA, MIA, MEA, MOCA, OROCA, or MSA.**



Guidance

Cold Temperature Compensation


- **The new procedures for pilots will be published in the Notice to Airmen Publication (NTAP) until permanent changes can be developed and approved for the AIM and other directives.**
- **Do not confuse Cold Temperature Compensation with the temperature limitations for Baro-VNAV equipped aircraft noted on RNAV (GPS) and RNAV (RNP) approaches.**

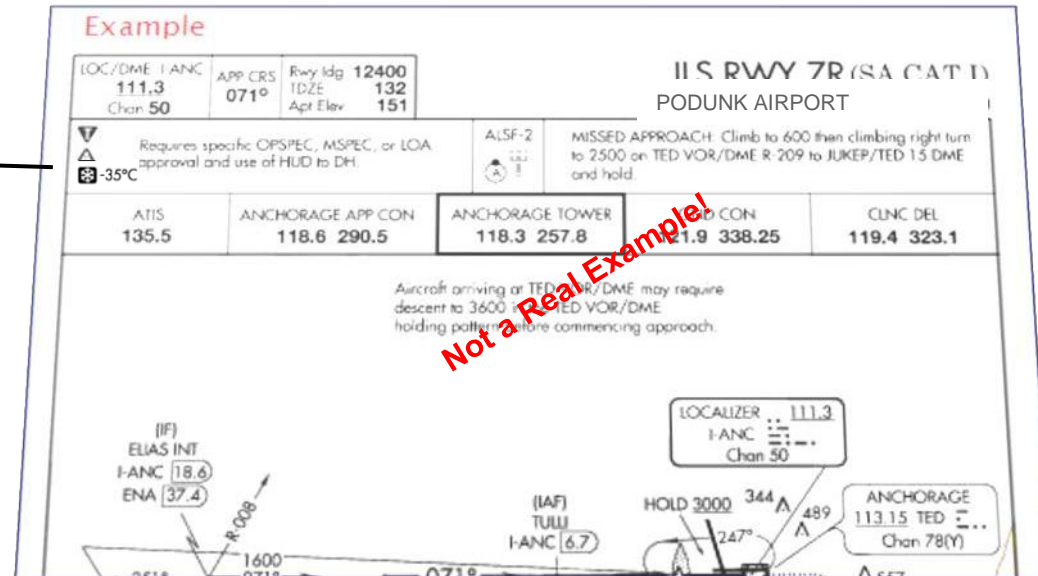
Note: Baro-VNAV is an RNAV system that uses barometric altitude information from the aircraft's altimeter to help compute vertical guidance for the pilot. Pilots need to check for temperature limitations when using Baro-VNAV systems.



Guidance

Cold Temperature Compensation

 -35°C Approach procedures subject to mandatory cold temperature compensation will have a “snowflake” symbol with the cold temperature threshold in the Chart Notes box.



Not a Real Example!

New IAP's with this new symbol will not be available until after January 8, 2015. Alaska will have several airports affected by this.



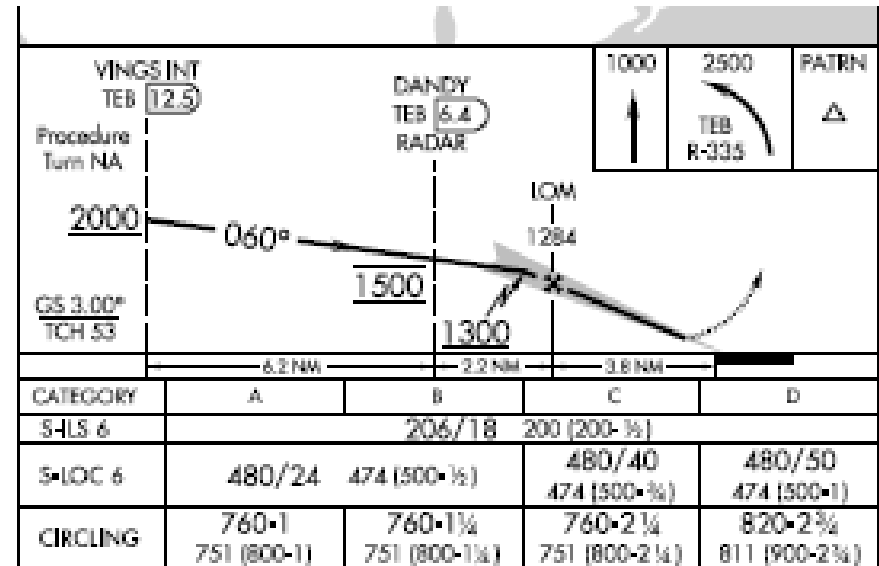
Caution!! - Cold Temperature Compensation Real-World Example

ILS or LOC RWY 6

ATC should be cognizant of situations where Cold Temperature Corrections could cause problems with vertical separation.

An example is the ILS or LOC RWY 6 at Teterboro. Note a mandatory crossing altitude of 1500 at DANDY intersection. The mandatory altitude is there to protect for crossing traffic above DANDY at 2500. If the aircraft on the approach were to correct their altitude upward due to cold temperatures, less than standard separation could be the consequence.

Effective January 8, 2015, the pilot is not only required to advise ATC they are compensating, but also by how much. This is not out of the question as several pilots have reported that they have corrected altitudes at TEB in the past due to cold temperatures.



TETERBORO, NEW JERSEY
Amdt 29F 20SEP12

40°51'N • 74°04'W



ATC Awareness and Responsibilities

Cold Temperature Compensations

Questions?

Q. What altitude does ATC assign to an aircraft making an approach on an unpublished route if compensating for CTC?

A. CTC can only be made on the approach beginning at the IAF and in many cases throughout the approach, including the missed approach in some cases. However since the CTC may be made at the IAF, aircraft may want to adjust prior to the IAF. **Assign the appropriate altitude you would usually assign IAW JO 7110.65 paragraph 4-8-1 and ZAN SUP 1 (MIA, IAF, TAA or published transition altitude). The difference is that the assignment would be stated as “at or above.”** The CTC altitude is always going to be higher than the normal altitude you would assign. Example: The minimum MIA and IAF altitude are 2000'. The aircraft advises they are compensating to 2200' at the IAF. Your clearance would be to cross the IAF at or above 2000' unless you need to pin them down to a specific altitude for vertical separation (see below).

IMPORTANT!

You must always provide vertical separation from other aircraft when another form of separation is not being applied. If you assign an aircraft 3000' until over the IAF and the aircraft advises they are compensating to 3300' over the IAF, you MUST ensure that vertical separation exists between the aircraft that is compensating and the other aircraft involved. In this case the aircraft compensating would need to be assigned a crossing restriction of 3300' and the other aircraft assigned at least 4300' or above as applicable.



Summary:

Effective January 8, 2015

- Pilots will be **required** to notify ATC if they adjust their altitude due to Cold Temperatures Compensation, except when in the final approach segment.
- Pilots will be **required** to report the amount of compensation.
- ATC must apply approved separation **(between other aircraft)** reference the new reported altitude. *7110.65 Para 5-5-4 Minima; and Para 5-5-5 Vertical Application .*
- ATC must not disapprove a compensation request when it relates to an approach procedure, as it is considered critical to the safety of flight.

