Fraport AG | Noise Abatement

Noise Abatement

As the operator of Frankfurt Airport, we endeavor to continuously reduce our noise footprint by active and passive noise-abatement measures. An example for this is setting incentives by emission-based airport charges. This is supposed to induce air carriers to use airplanes with low pollutant and noise output.

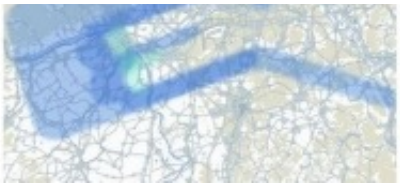
Moreover, Fraport draws up a positive balance of its voluntary Casa program. Through the program, Fraport purchases residential property where planes fly particularly low. The program thus represents another valuable contribution to the compatibility between air traffic, which is of utmost importance for the region, and the protection of residents. In this connection also the compensation for outdoor living areas is worth mentioning. This program grants owners who due to aircraft noise have to bear with a reduced utilization of their outdoor facilities a one-time compensation.

Please consult the following section to inform yourself in detail about our active and passive noise-protection measures.

Active Noise Abatement

Passive Noise Abatement

Active noise-abatement measures solve the problem right at the source of the noise and aim at avoiding or reducing or aircraft noise or at ensuring improved distribution of noise.



The effects on the individual regions of measures already implemented can be tracked back via the map sections in the takeoff/landing direction concerned: operation direction West/25 or operation direction East/07.

An overview of our noise abatement measures and future plans can be downloaded here . You can find further information on our sustainability programs here. A description of our important environmental aspects and management initiatives can be downloaded here .

Ground Noise

Reducing ground-level engine noise by using electrically driven aircraft tractors (TaxiBot/E-taxi)

Thanks to electrical drives, taxiing movements of aircraft performed at the airport with running engines should be reduced or made without the airplane's own engines. One way to accomplish this is to use electrically driven aircraft tractors, controlled in the cockpit of the towed aircraft (TaxiBot). Another way consists in fitting a wheel hub motor to an aircraft's main landing gear serving as an electrical drive (E-Taxi). This application is still being evaluated.

Noise-reducing screening walls

An engine test-run facility reduces the noise emissions towards nearby residential areas. The facility built at Frankfurt Airport was the subject of a zoning request by Fraport. This facility allows reducing the peak level from engine test runs by up to 5 dB(A) thus affecting the residential areas considerably less.

Provision of Pre-Conditions Air Units

Both with a view to noise emissions and pollutant emissions, stationary units operate considerably more efficiently than auxiliary power units. Consequently, this measure allows reducing ground noise in the immediate surroundings.

Monitoring the use of reverse thrust

An acoustic monitoring system was implemented at Runway Northwest for westerly operations (runway designator 25) in May, 2015. This system is now being tested and optimized. A reverse thrust with higher load levels represents a disturbing noise event in the nearby

residential areas. Reducing such cases of use equals means less disturbances.

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Flying Higher

Improving departure procedures

Limiting the speed at a certain point in the departure route results in the fact that the thrust brought about by the engines results in a higher altitude rather than in greater speed. Consequently the aircraft climbs somewhat more steeply.

Introducing Continuous Climb Operations (still under development)

Normally departures take place in a stepwise pattern until cruise altitude has been reached. There are phases between these stepwise segments where aircraft fly higher horizontally, thus not gaining altitude. Continuous Climb Operations (CCO) are meant to bridge these level flight segments by a continuous climb.

More frequent Continuous Descent Operations

This procedure allows aircraft to descend from high altitudes almost without any horizontal flight phase, without intermediate thrust, and therefore also quieter.

Gliding angle of up to 3.2 degrees

Fraport AG acted as sponsor of this measure, which has been in use since October 18, 2012.

Raising the approach angle from 3.0 to 3.2 degrees on the Runway Northwest became standard on December 19, 2014 after more than two years of testing this measure. The results of the test operation had been completely positive. Measurements made by the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt, DLR) during the entire test phase at seven noise measurement stations at Frankfurt Airport and at the Environmental Station (UNH) showed a reduction of the maximum noise level from 0.5 to 1,5 dB(A) depending on the site of the measurement station and the type of aircraft.

Raising the minimum downwind approach angle by 1,000 feet

On October 18,2012 the minimum flight altitude both on the Northern and on the Southern downwind legs were raised by 1,000 feet (approx. 300 meters).

Raising the altitude for starting final approach up to 5,000 feet

The altitude for aircraft coming from the South and turning to start final approach is raised

The altitude for aircraft coming from the South and turning to start final approach is raised from 4,000 to 5,000 feet (approx. a 300 meter difference). In the parallel independent operation the turning operations from the South must continue to be by 1,000 feet lower than from the North, thus 4,000 feet in the South and at least 5,000 feet in the North.

Lengthening the Instrument Landing System (under development)

It is envisaged to raise the altitude for approach flights turning to start final approach by 1,000 feet (300 meters). When turning from the North, this will be accomplished by gearing to the ILS approach light beacon at 6,000 feet and when turning from the South at 5,000 feet. In order to implement this measure, the range of the instrument landing system (ILS) needs to be expanded.

Introduction of a Ground Based Augmentation System (GBAS)

GBAS is a satellite-based precision landing aid that is additionally supported by a ground station. This technology considerably improves the accuracy of satellite navigation. Aircraft equipped with GBAS receivers may determine their own position so accurately that precision landings are possible without the need of an ILS. In the medium term the new landing system will also permit to raise the approach angle from 3.0 degrees to 3.2 degrees on Runway South and on Runway Center (25L/C and 07 R/C), a measure that had so far only been possible on Runway Northwest. In addition, the GBAS technology provides the possibility to use curved, segmented approach procedures without affecting capacity. Such procedures make it possible to direct arrivals around densely populated areas.

Steeper Approach procedures (under development)

In this procedure the approach flight is initiated from a relatively high altitude, at about 8,000 feet, (approx. 2,400 meters) using an angle of 4.49 degrees. Once approximately 2,000 feet (600 meters) have been reached, the light beacon of the instrument landing system (ILS) is geared to from above in a 3.0 or 3.2 angle.

Point Merge procedure (under development)

Point Merge is a novel method for sequencing arrival flows. Instead of using the current flight paths, arrivals are bundled into funnel-type structures and guided towards final approach. In theory this technique is to support continuous descent operations in higher altitudes for a longer span of time.

Modified Arrival Routes

By raising the minimum altitude of arrival sectors, approaches will be kept in higher flight altitudes for a longer period of time.

Noise Respite Periods

The Noise Respite model

It is the goal of noise respite periods to lengthen the neighbors' nighttime rest by one hour. While this does not change the total number of aircraft movements, such alternating noise intermissions make sure that a part of the neighbors will not be bothered by flights between 22.00 PM and 05.00 AM, and the other part of the residents will be free from aircraft noises between 23.00 PM and 06.00 AM.

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Quieter Aircraft

Fitting the engines of Lufthansa's B737 fleet with acoustic panels

This is a noise reduction measure for Boeing 737 jetliners with CFM-56-3 engines. Replacing twelve acoustic panels at the engine inlet reduces the aircraft noise both during takeoff and landing. Lufthansa implemented this measure for the B-737 aircraft stationed at Frankfurt Airport already at the end of 2011. This has led to a recertification for the B737 fleet into the quietest noise category.

Withdrawal of Lufthansa's B737 fleet

It is envisaged to have all B-737s replaced by newer aircraft by 2017. Noise reduction will then be possible in all takeoff and departure flight phases.

A320 vortex generators

Fly-over measurements at an Airbus A320 identified two piercing sounds generated by tank pressure compensation openings on the underside of the wings. Mounting so-called vortex generators on the wings alters the air stream and these annoying sounds disappear completely.

Modernization of fleets

Upgrades at engines, fuselage parts and control panels made during the last decade have brought about a significant noise reduction.

Further reductions of acoustic emissions "right at the source" are expected by new, even quieter aircraft generations, which, among other features, will be equipped with the so-called geared turbofan

geared turbofan.

In 2014, Lufthansa placed a large order for modern long-haul aircraft. Along with the use of Boeing B 777-9X and Airbus A 350-900 jetliners, it is expected that kerosene consumption, and thus also CO2 emissions, can be reduced even further, and that acoustic emissions will decrease, too.

Modulation of noise-related airport charges

Airport charges are another way for Fraport AG to contribute to reducing aircraft noise levels. When fixing airport charges, Fraport has been taking aircraft noise into account since the Nineties. In 2001, Frankfurt Airport was the first airport ever in Germany where a component related to in-situ noise was considered in the takeoff and landing fees. Up to then, certification data of the aircraft had served as the basis for noise differentiation of these charges.

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Flying around Residential Areas

Segmented Final Approach between 11.00 PM and 05.00 AM

Segmented RNAV (GPS) approach is a satellite-based approach procedure. Approaches can be directed along the segmented approach trajectories in both operation directions and around residential areas.

As a result of its capacity-reducing effect, the segmented approach procedure can by used only when traffic is low.

Increased use of westerly direction

As shown in the above illustration, some residential areas in the western part of the airport are directly adjacent to the airport premises, which means that they are flown over in the landing direction 07 at very low altitudes. This is the reason why operation direction 25 is the preferred scenario at Frankfurt Airport. On a yearly average this direction is used at some 70 percent of all days.

Flying around densely populated metropolitan areas

Analyses of the Airport and Region Forum, FFR showed that the target parameters for a regular operation had already been reached in May 2013:

Already back then almost no aircraft were starting final approach above the residential areas of Mainz and Offenbach; the area affected by aircraft noises, therefore, concentrates on the direct ILS approach baselines. Fly-over altitude is generally higher in these areas.

Fewer takeoffs via Frankfurt and Offenbach during easterly operations

The original design assumed introducing an additional departure route which, for flights taking off at the parallel runway system during easterly operations, would have been located east of the existing 07-N departure route (long) and would also have been used for northbound departures. This plan, however, was never realized. The expert committees are looking into this matter to examine relocating the takeoffs from the 07-N (long) to 07-0 departure route to relieve the urban areas located below the 07-N (long), in particular Frankfurt and Offenbach.

Adaptation of the "Amtix" departure route to relieve the city of Darmstadt (under development)

This measure aims to reduce aircraft noise over densely populated areas in the northern part of Darmstadt.

Changing the "Amtrix" (short)" departure route has the objective to cease flying over this area. Beyond this area, the flights would continue on the existing trajectory.