

committee, the U.S. airlines in the beginning delayed introducing jets into service in the United States because of noise abatement factors. Even before the introduction of the turbofan engine the industry spent more than \$50 million trying to develop in-flight noise suppressors for the first jet aircraft. From the very beginning noise suppressors were installed on commercial jet engines, in contrast to military jet aircraft which were operated without suppressors and even used afterburners which intensified their noise emission.

By 1962 the airlines had installed noise suppressors on 325 jet aircraft at a cost of a quarter of a million dollars per aircraft, a total of \$73 million for the industry. By 1965 the airlines invested nearly \$150 million in the installation of noise suppressors.

In addition to this original cost of installation, it has cost the airlines approximately \$10,000 per aircraft per month to operate the noise suppressors because of the increased weight and drag, causing reduced speed, a total of \$36 million per year in cost of operation of suppressors.

When the subsequent fanjet engine was developed as a replacement for the turbojet engine, it was for the very purpose of reducing noise output, and it did significantly reduce the jet noise output from operations from five to ten so-called "PNdB's" (perceived noise decibels). Five to 10 PNdB's might not sound like a large figure. But when you bear in mind that a reduction of six perceived noise decibels is equal to a 50-percent reduction in the quantity of noise, five to 10 PNdB's was a significant reduction in the amount of noise output.

One airline even replaced all of its existing turbojet engines in its entire fleet at a cost of a million dollars per aircraft. The industry thereafter at further expense redesigned the fan engine itself with "hush kits" to further reduce that noise output.

Apart from these industry measures to reduce aircraft noise at the source, the airlines have borne the burden of the cost of reducing noise on the ground by airport measures.

For example, the airlines serving New York-Kennedy Airport have agreed to pick up the bill for \$11 million at that airport alone for runway extensions carried out, not for any operational reasons, but solely for noise abatement.

Finally, the aviation community itself has provided significant leadership to both industry and Government efforts to alleviate aircraft noise. I refer, for example, to the work of the Society of Automotive Engineers, which has included numerous aviation industry representatives, and which have pioneered in the technical study of aircraft noise standards and abatement procedures and development of refined noise measurement criteria.

In fact, the SAE studies have been adopted by the Federal Government as the basis for the present FAA proposals to establish maximum aircraft noise levels for certification. I might add that there is also underway at the present time a study by the private professional sector, the American Bar Association, which has a project now being carried out at Stanford Law School to develop a rational legal solution, on a Federal basis preferably, for the aircraft noise and sonic boom problems in the United States.

The study is supposed to be completed and submitted to the American Bar Association in December.