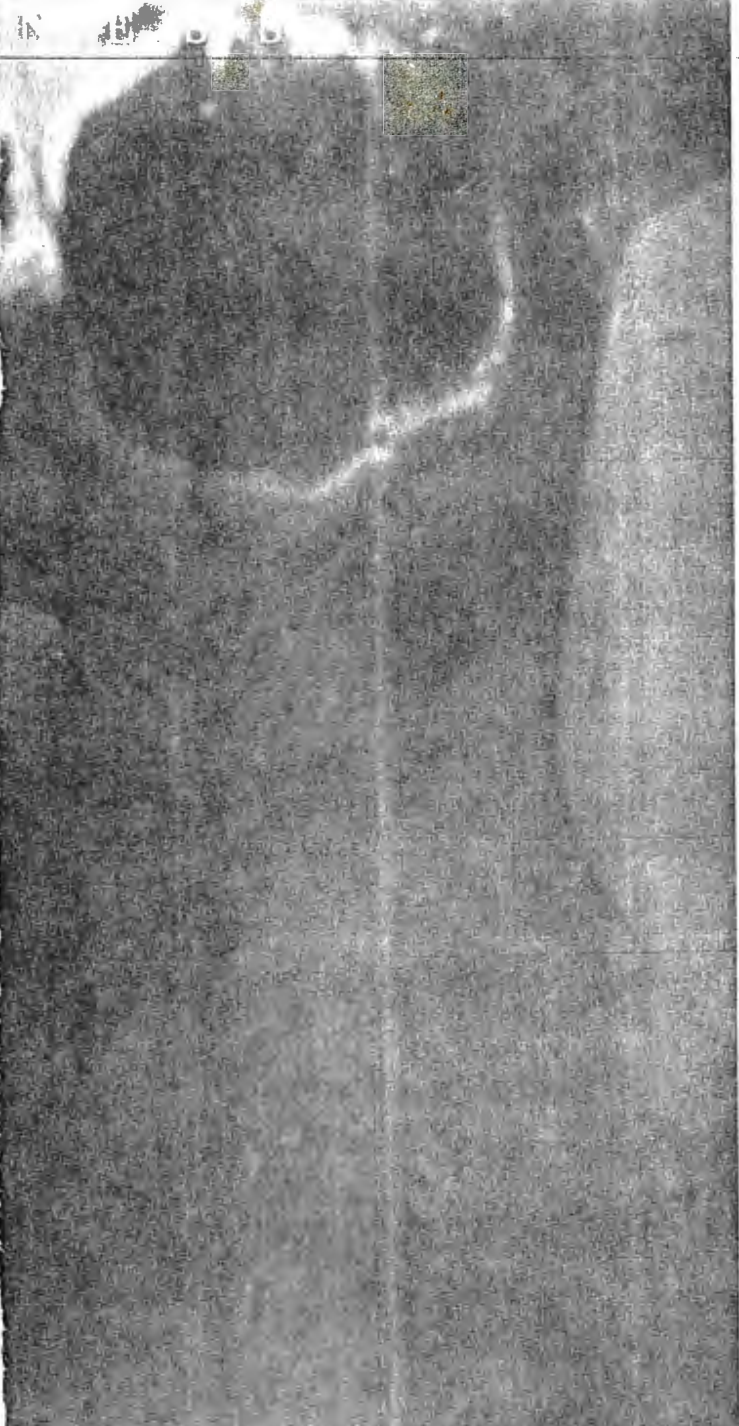
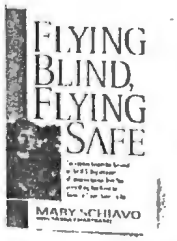




Mary Schiavo, Inspector General of the Department of Transportation, was working at her home computer on Saturday, May 11, 1996, when she received a phone call that made her feel "queasy and sick." It was the kind of nightmare she had long feared: ValuJet Flight 592 had crashed in the Florida Everglades. A fire had broken out in the cargo hold of the jet, an ancient DC-9 en route to Atlanta from Miami, filling the cabin with smoke and probably asphyxiating the 110 passengers and crew members before they were swallowed by the swamp. Schiavo was disturbed not only because of the scale of the tragedy but also because she knew it might have been averted. Just three months earlier, Schiavo had warned the Federal Aviation Administration about ValuJet's awful safety record. But the FAA let the airline keep flying, despite Schiavo's concern and a recommendation from some of the agency's own inspectors that ValuJet be shut down.

The night following the crash, Schiavo would be ignored no longer: she appeared on ABC's Nightline *opposite FAA administrator David Hinson, who insisted that ValuJet was "safe to fly. I would fly it." Flatly contradicting him and alluding to the FAA's mission to promote air travel, Schiavo declared, "It's not my job to sell tickets on ValuJet." She dramatically disclosed to a national audience the FAA's own damning statistics: ValuJet's safety record was 14 times as poor as that of other discount carriers, even though the agency claimed that all airlines were equally safe. "I would not fly ValuJet," she said.*

In more than five years as Inspector General, Schiavo spent a lot of time refuting the FAA. Although her TV revelation seemed like the first act of a whistle blower, it was in fact the dénouement of a personal crusade to make the agency more responsive to safety issues—and less responsive to the needs of the airlines. Stifled continually by the FAA's political prowess, Schiavo eventually decided that the best way to bring about reform at the agency was to resign and tell her story. In the following excerpts from her new book, Flying Blind, Flying Safe, *she describes how her work at the Transportation Department left her "dismayed, disillusioned and afraid for the flying public."*

After the crash, ValuJet was grounded for more than three months. The carrier has since returned to the air, although reduced in size. Is ValuJet safe to fly? Is any airline? Yes, if compared with other means of transportation, such as autos. But given the rapid growth of air travel, today's low accident rate will mean greater numbers of crashes in the next decade unless safety is improved. In the wake of Schiavo's campaign, Congress has changed the FAA's mandate to make safety its primary mission.

O TROUBLE

gs, the FAA has made air travel more perilous than it need be

THE BIBLE MAY TEACH THAT HUMAN LIFE IS PRICELESS, but in my early years as Inspector General, I heard rumors that a Federal Aviation Administration study assigned a worth to the average passenger who might die in a plane crash. In its cost-benefit analysis, the rumor went, the FAA easily determined that the value of those lives didn't amount to much compared with the hard, cold billions that saving them would cost in aircraft-safety devices, in beefed-up monitoring of planes, pilots and air traffic, and in airports hermetically sealed against bombs and hijacking.

Curious and incredulous at the macabre implications, I frequently asked about these elusive valuations and talked to many people who had heard about them or knew someone who knew someone who had heard about them. Yet I never met anyone who had actually seen the official figures, much less helped compile them. In many meetings, FAA officials argued as if they had those figures on the tips of their tongues—"losses," they would explain patiently, from the small number of crashes and even smaller number of attacks on planes just did not justify vast airline investments in safety and security. After all, as the FAA's associate administrator for civil-aviation security, Cathal Flynn, would tell me, the terrorist bombing of Pan Am Flight 103 over Lockerbie, Scotland, cost $1 billion. Trying to prevent another Pan Am 103 would cost $5 billion over 10 years. Couldn't I understand? The numbers just didn't add up.

"We regulate by counting tombstones," an FAA official told a journalist a few years ago. The nickname's origins are unknown, but by the time I joined the Department of Transportation, even people who worked for the FAA cynically called it the Tombstone Agency. Within the Washington Beltway, agency officials, government bureaucrats, staff on Capitol Hill, aviation lobbyists, airline representatives and journalists all understood the poignant irony of this nickname. The FAA will not do anything until people die. It was a sad, bad, inside joke. Only the public never knew how much truth was in it.

I had leaped at the chance to be Inspector General because the job combined the four things I loved most: investigations, law, aviation and public service. Truthfully, the office was tailor-made for me, and I was happy to quit my post as Assistant Secretary of Labor in charge of keeping union elections honest. Everyone encouraged me to take the Inspector General job—but only if I intended to do something with it.

In August 1990, I walked into Secretary of Labor Elizabeth Dole's office. Dressed in slacks, wearing her glasses, Dole was hard at work on a hot Sunday afternoon. The building was quiet—in fact, the whole city was quiet since Congress was not in session. I told her I was thinking about leaving her department.

"That would be a very interesting challenge," Dole said of the Inspector General job. "You could do some good. But be sure you know what you're getting into." I thought I knew what she meant; only later would I fully understand her warning.

I became the watchdog of the FAA. The FAA, in turn, stood guard over the airlines. But that role could be interpreted two ways: as policing the airlines to ensure safety at all costs or as protecting the airlines from any opposition or criticism. During five years as Inspector General, I came to realize that the FAA believed the statutes ordered it to champion the aviation industry.

Time and again, my office uncovered practices that would shock the public: sloppy inspections of planes, perfunctory review of pilots, lax oversight of airline procedures, disregard for bogus airplane parts, sievelike security at airports, antiquated air-traffic-control systems. Only with a major crash, only with people dead and sobbing survivors filling television screens, does the FAA step up to the plate and make changes. I found the FAA's complacency toward accidents difficult to accept.

IN 1994, 68 PEOPLE DIED WHEN AN AVIONS DE TRANSPORT REgional plane, flown by American Eagle, crashed into a soybean field in Roselawn, Indiana. A design flaw made the French-Italian plane become violently uncontrollable in cold weather. Pilots and aeronautical engineers knew what the problem was: the deicing boots on the ATR wings were not big enough. Those are the rubber sleeves on each wing that can be expanded to crack sheets of ice. But the FAA determined that lengthening the boot would cost too much money. It took three plane crashes, the third one scattering human remains and debris over eight acres of Indiana farmland on Halloween, before the FAA ordered extension of the deicing boot and limits to ATR flights in icy weather.

It also took a fatal plane crash for the FAA to heed years of evidence showing that the distance between planes landing at an airport should be increased. For years, the National Transportation Safety Board [the independent agency that investigates plane accidents] told the FAA to increase the distance between jets. The board studied 51 accidents caused by wake turbulence from 1983 to 1993. Twenty-seven people had been killed, and 40 planes had been damaged or destroyed. In those years, the NTSB repeatedly asked the FAA to set new rules, but the FAA refused. It would be three years more before the FAA ruled that the separation between heavy and lighter aircraft should be increased.

Since 1982, the NTSB has urged the FAA to order airlines to install better black boxes [the flight-data recorders that can provide clues to the cause of an accident]. All the NTSB wanted was black boxes that can continue recording for fractions of a second beyond a catastrophic explosion or massive electrical failure aboard an airplane. European airlines have used such advanced black-box technology for years. That means many American planes flying to Europe have the advanced boxes. But the FAA did not want to *compel* airlines to install improved boxes. No, the agency declared, the new technology would cost the airlines too much money.

The NTSB was especially keen to have the boxes installed on Boeing 737s. Investigations of two accidents involving B-737s—one outside Colorado Springs, Colorado, in 1991 and the other in Pittsburgh, Pennsylvania, in 1994—have been seriously hampered by the lack of this information. Instead of pressing the airlines to find an economical way to install new black boxes and instead of sending its own investigators to challenge the airlines' assessment of the cost, the FAA simply embraced the carriers' argument that the project would be too pricey.

"Had the FAA and the industry begun the implementation of this recommendation in March 1995," when the NTSB originally made the request, said NTSB chairman Jim Hall at the end of the following month, "most Boeing 737s would have been retrofitted with an acceptable, short-term, improved recording capability by this time. The lack of FAA action to date is unacceptable."

More than a year later, in the days after TWA Flight 800 crashed into the Atlantic Ocean, the public, politicians, investigators and grieving family members waited tensely while scuba divers searched for clues. Eventually the recorder was found, its body remarkably undamaged. But it played back only a millisecond of a mysterious loud noise. The box was one of the old models, and didn't have the extra capacity to record in the midst of a catastrophe like the one on TWA Flight 800.

The FAA regularly told the NTSB that it couldn't have anything on its wish list of safety measures because of cost considerations. It told the same thing to the Inspector General, Congress and the White House. It reassured the public with the mantra "Accidents are not happening; planes are not falling out of the sky."

Yet they are, and the danger is growing. In one meeting I attended, the FAA said that shortly after the turn of the century, aircraft accidents will increase dramatically. The officials [who were making the case for increased FAA funding] said matter-of-factly that if demand for flights increases at present rates and if growth of discount airlines keeps up at the current pace, we can expect a major crash every week or so after the turn of the century.

Stunned, I wanted to study the data. (At the close of the meeting, FAA officials collected all of the documents they'd shown us at the session.) Where had the figures come from, how had they been interpreted and substantiated, and what were the airlines planning to do about it? More important, what did the FAA plan to do to prevent all these crashes?

I asked the FAA to send me the graphs and any supporting research. The reply was swift: no such data existed, I was told. No charts or graphs like that here, the FAA said. In fact, no such research had been done, no such conclusions reached. But I'd seen them, I argued; I'd held them in my hands! That didn't matter; suddenly none of the officials knew what I was talking about.

Over the next years, I learned firsthand that, sadly, withholding information was routine for the FAA. Fortunately, the Boeing Co. made similar statistics public in a study that said, "If, as we expect, air traffic is to double in the 1990s, we need to reduce by half our accident rate just to hold our own."

WHY THE VALUJET TRAGEDY DIDN'T HAVE TO HAPPEN

IT WOULD TAKE THE DEATHS OF MORE THAN A HUNDRED PEOPLE aboard a ValuJet plane that burst into flames, smashed into the Florida Everglades and sank in a murky swamp to expose chronic weaknesses in the FAA. The 110 souls on that flight probably never knew what caused the fire that took their lives. At first, government investigators could not pinpoint the reason for the disaster, either. [It was later found that the fire was apparently caused by dangerous oxygen generators loaded into the cargo bay without being carefully handled according to regulations.] But the tragedy would expose what the FAA had long known: ValuJet was primed for a major crash; its maintenance was slipshod; it had an accident rate 14 times as poor as those of its peers; its managers were out of their league; and the FAA's own inspectors had wanted ValuJet shut down months before the Everglades disaster.

Atlanta-based ValuJet was a phenomenal success story. In just three years, it had leaped from two planes on eight routes between Atlanta and Jacksonville, Orlando and Tampa, Florida, to 51 planes with 320 itineraries. Founded in 1993, the discount carrier saw revenue soar to $368 million in 1995.

But it became apparent [to the Inspector General's office] that closer scrutiny of this phenomenon was long overdue. There were plenty of signs that ValuJet was cursed by its own success, its growth straining its management and organizational structure.

In 1995, when ValuJet bid for a contract to ferry Defense Department personnel, Defense specialists had scrutinized ValuJet's books, inspected its facilities and talked to its pilots, me-

ng television screens does the FAA make changes

A BARGAIN WITH DEATH: ValuJet's start-up was hailed by consumers because it drove prices down. But the airline's rapid growth and skimping on maintenance contributed to a deteriorating safety record that would be revealed after the crash of Flight 592

J. LEYNSE—SABA. LEFT: A. STATES—SABA. CENTER: A. D'AZ—MIAMI HERALD. AP. RIGHT

chanics and managers. The Defense Department had complaints about virtually everything, and its report was breathtaking in the scope of its condemnation. The answer: No contract. ValuJet is not good enough to fly our people.

If the FAA had properly regulated ValuJet, its rapid growth might not have led to disaster. But that February in 1996, all that seemed clear to me was that the FAA simply did not know what to do with ValuJet. The airline's safety record had deteriorated almost in direct proportion to its growth. ValuJet pilots made 15 emergency landings in 1994 and were forced down 57 times in 1995. (I didn't know it yet, but that record would be surpassed within months with 59 emergency landings in the first part of 1996. From February through May that year, ValuJet would have an unscheduled landing almost *every other day.*)

As I probed, I learned that FAA inspectors had looked at ValuJet planes nearly 5,000 times in the three years it had been flying yet had never reported any significant problems or concerns. What are the odds of that?

Schiavo told her staff that their office had to do something about the FAA's oversight of ValuJet.

"Let's get someone down to Atlanta to find out what's going on with ValuJet," I said, not feeling wise or clairvoyant, just afraid. "There's something wrong, and we've got to find out before someone dies."

The next day deputy assistant inspector general Larry Weintrob and two other officials from my office walked into the Atlanta office of the FAA. There was only one major question: What is the FAA doing about ValuJet? Weintrob pressed for details about the recent spate of accidents. The reply stunned him. Confused, the FAA inspectors asked, What spate? The inspectors admitted they didn't know how many accidents there had been. Taken aback, Weintrob and his team laid out details: In its short life, Valujet had had more than its share of accidents and mishaps. Its planes repeatedly overshot runways and suffered from collapsed landing gears. Planes took off in weather that kept pilots of other airlines on the ground. Fires broke out on planes. Engines exploded. In one blast, the engine spewed shrapnel into the fuselage of a plane, piercing the metal and injuring seven people inside.

Some of the stories, Weintrob recalled, were too outrageous to believe at first. Crews on a jet complained about a broken weather radar system 31 times before it was fixed; when a Boston flight had a stuck landing gear, the plane was diverted to the Washington area, but on the way, the landing gear started working again, so the crew continued to fly without taking the plane in to be serviced; mechanics used duct tape to patch planes; a mechanic wielded a hammer and chisel to fix a sensitive engine part, and later that engine had to be shut down in flight.

Some individual ValuJet planes had chronic problems. It would not have been difficult for inspectors [in the Atlanta FAA office] to go over ValuJet records and trace these persistent breakdowns. Instead, the Atlanta inspectors seemed unimpressed with the summary [of problems compiled by Weintrob]. The number of accidents and incidents was not "disproportionate," they said. There was no common link between them. The FAA had no special plans for ValuJet.

But Weintrob's visit apparently prompted the FAA's Atlanta office to think twice about its conclusions and conduct its own quick re-evaluation of the ValuJet safety record.

A few days after [our investigators' visit], the Atlanta FAA staff wrote a memo to headquarters. For eight pages, they described accidents and poor FAA surveillance until reaching an inevitable conclusion so startling and obvious that it should have changed history—except that it was also a conclusion so threatening to

The tragedy exposed what the FAA had long known:

ValuJet and contrary to FAA habit that the memo was immediately buried, secreted away until disaster forced it into the open.

That disaster came three months later, on May 11, when ValuJet Flight 592 plunged into the Everglades.

After the crash, government officials began appearing on television to reassure the public that discount airlines were safe to fly. Top officials at the Department of Transportation shifted quickly into crisis-management mode. Secretary Federico Peña drew on his own experience flying ValuJet to reassure the public on national television: "I have flown ValuJet. ValuJet is a safe airline, as is our entire aviation system." Peña insisted that "if ValuJet was unsafe, we would have grounded it."

In an agitated, defensive voice, Peña said an FAA report proved that discount airlines were as safe as the major carriers. But Peña had to know this simply wasn't true. He was protecting

an airline just the way government officials had for decades. In fact, the FAA had an avalanche of evidence that proved that ValuJet had been troubled for months and that other marginal airlines were just as unsafe. Conclusions from the report Peña referred to were etched into my memory. It revealed that the cumulative safety rate of discount carriers was skewed because one of them, Southwest, had a nearly perfect safety record. Good grades for Southwest brought up the average for everybody. In contrast, ValuJet was singled out for its accident rate, 14 times as poor as that of the major carriers. So what was Peña talking about? The ValuJet crash thrust before the public the fact that an inferior airline was allowed to continue flying because of economic pressure.

I was working at home on my computer when Peña took to the airwaves. As I heard his comments from the television across the room, my fingers froze over the keyboard. Was Peña ignorant of the true nature of the FAA?

The FAA administrator, David Hinson, echoed [Peña's] assurances. A former executive at Midway Airlines and McDonnell Douglas, Hinson had always seemed genuinely determined to streamline the FAA and address safety as well as commercial interests. Yet I knew he had to have seen the agency's own account of the differences among air carriers. Hinson had to realize that within a few days of the disaster, records had revealed that the crashed plane was a used DC-9, serial number 901VJ, that had been plagued with faulty equipment and emergency landings since January. Watching Transportation and FAA officials, I realized there was no charitable way to characterize what they were doing—they were simply lying to the public about ValuJet's record. It was not the first time I had seen the department react to a plane crash with a blitz of political spin control. But this time their overstatement and vehemence left me outraged.

The FAA officials very likely would have continued with their charade if not for a phone call to my home late in the week after the ValuJet crash. An anonymous FAA employee had tracked me down through a reporter. I needed to know, the voice said nervously, that in the days after Weintrob grilled the Atlanta inspectors about ValuJet, the Atlanta staff took a good look at the airline. Ten days later, they put their fears in writing to headquarters. Did I understand? the caller demanded. The field staff in Atlanta had recommended *in February* that ValuJet be grounded. They had put it in writing. Someone had quashed the memo.

The person on the line had just left the FAA building to call and tell me that one of the FAA associate administrators had gone into his office for a meeting to discuss the secret memo. He had the memo with him right now, the caller insisted.

I dialed the Inspector General's investigations office. "Send an investigator with a subpoena over" to the FAA, I demanded. For once, government wheels turned quickly, and the investigator rushed to the FAA. The meeting was already over, though, and FAA officials said they knew nothing about the memo.

But the next morning, the FAA called a press conference to offhandedly release a tall stack of ValuJet documents. Buried in the middle was the innocuous-looking report from the Atlanta staff. I practically lunged at the copy handed to me. Skimming several pages on Valujet's troubles, I stopped short at the field inspectors' bombshell: that "consideration should be given to an immediate FAR-121 recertification of this airline." Official FAA jargon, yes, but the meaning was clear: ground ValuJet.

The memo from the field, written three months before the May 11 crash, proved highly embarrassing to the FAA and helped force the agency to re-evaluate its self-assured contention that ValuJet was a "safe airline."

NO WARNING: A fire in its cargo hold filled Flight 592 with smoke before it crashed. The NTSB had urged that fire detectors be mandatory in cargo holds. Typically the FAA refused, citing costs

Spurred by the gruesome deaths and public outrage, FAA inspectors examined ValuJet's own books and discovered so many egregious violations that the carrier was grounded within weeks—on June 17. The resulting consent order between ValuJet and the FAA listed 34 violations going back three years, breaching every type of regulation. ValuJet agreed not to fight its grounding and paid $2 million toward the FAA's cost of reinspecting planes. It was not a penalty; in fact, the airline bought itself a virtually clean slate. "The FAA agrees that, except for violations of regulations concerning hazardous materials and civil aviation security," the consent order said, "it will not pursue any civil penalty for any violation of the regulations known by FAA as of the date and time of the execution of this agreement." How could it? The FAA could hardly go back and find the faults without admitting that it was to blame for missing or ignoring them in the first place.

Yet I knew the FAA was to blame; my senior staff agreed, and Congress had heard from us that this was the case. And we knew ValuJet was not alone. Shoddy inspections were an FAA plague. Exposing them had occupied me since my first year on the job.

LIFE WITH THE TOOTHLESS ENFORCER

THE FAA IS RESPONSIBLE FOR CERTIFYING AND THEN CONTINUALLY examining aircraft design, airline operations, airplanes, pilots, mechanics, repair stations, aircraft parts—essentially every stage of commercial aviation. The agency does this with one basic tool: inspections. The nearly 3,000 FAA inspectors are the main link between the government and the airlines, and it is their job to make sure the carriers operate within the law. They are supposed to stay on top of the airlines, verifying that planes and pilots are in shape to fly. It's a hands-on job, one that pays from $40,000 to $70,000 a year. To do their work properly, inspectors should follow detailed checklists and keep up on training. But most of all, they need motivation, a sharp, diligent eye—and impartiality.

Inspectors did an abysmal job of examining the nation's aircraft operators. Countless required or recommended inspections were never conducted, while others were carried out so perfunctorily that they were meaningless, and still more revealed problems that went unreported just to spare the airlines any inconvenience. Inspections of planes, pilots, mechanics and repair stations were so unreliable as to be virtually useless. Fortunately, most of the time savvy and diligent airlines filled the gap. But it was inevitable that the inspection process would eventually break down at an airline like ValuJet, creating the perfect conditions for a deadly crash.

The numbers were stunning: from 1988 to 1990, 833,000 inspections turned up fewer than 4,000 violations. The inspectors issued few warnings or fines and rarely tracked cases or followed up on inspections. Landing gear, oxygen systems and engine controls were checked in less than half the inspections. The engines were inspected only 52% of the time. Yet the FAA insisted it completed thousands of inspections every year. How many were thorough? And what about those that were not completed?

We knew inspections were haphazard, but some of the examples were simply ludicrous. In 1995 Delta Airlines planes underwent nearly 13,000 inspections—but received only seven violations. The inspectors rarely did the paperwork necessary to follow up on the few problems they uncovered.

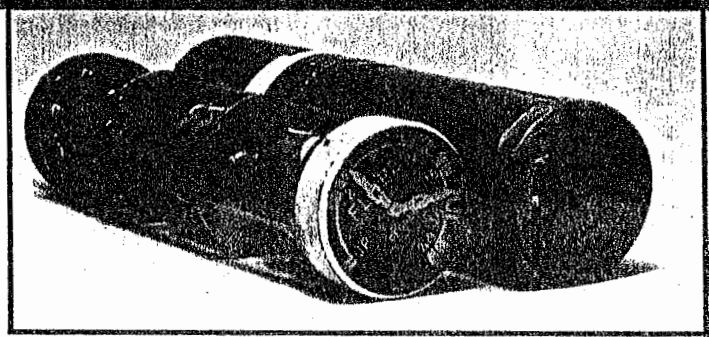
Between 1990 and 1996, my office issued 10 reports, all of them critical, on the FAA's inspection system—of aircraft operators, parts manufacturers, repair stations, designated mechanic examiners. Every investigation or audit was a battle, accomplished only after crafting strategies to outwit the FAA. My office made 70 recommendations to intensify FAA inspections. The NTSB weighed in too, pointing out that a 1988 crash that killed 12 people might not have happened if the FAA had been more meticulous in inspecting the airline and its pilots. Unfortunately, slipshod review of aircraft is the norm, not the exception.

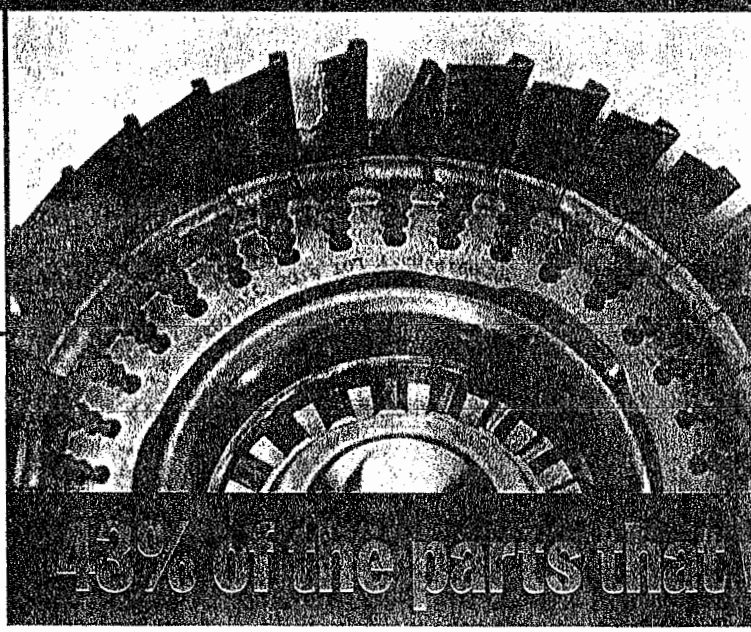
OUR SEARCH FOR BOGUS PARTS

IN MY FIRST MONTHS AS INSPECTOR GENERAL, I LEARNED THAT MY predecessors had made only occasional forays to review just how the FAA inspected parts manufacturers and suppliers. The FAA was satisfied with the procedures in place for monitoring parts makers and brokers. But I couldn't help noticing the reports that crossed my desk: allegations about fraudulent aircraft parts were more numerous than ever, aging aircraft fleets still needed replacement parts that their manufacturers no longer made, more and more parts makers were foreign operations, the number of parts brokers and distributors was increasing every year, and the price of parts was skyrocketing. Still, the FAA continued to assume that most parts were properly manufactured and safe. This last alarmed me: if the opportunity existed for making and selling counterfeit parts with little FAA oversight, then the chances of getting caught were slim. How could an unscrupulous manufacturer or broker pass up odds like that?

In 1991 the FAA got only a few hundred reports of bogus parts. Nevertheless, I knew each report could represent thousands of parts. The number of brokers, on the other hand, is unknown. The

Our studies of parts bins were mind-boggling:





In 1992, Schiavo's office investigated seven of the FAA regions and found trouble.

REALLY FAKE: The FAA insisted that bogus parts don't exist, only "suspected unapproved" ones. Schiavo's inspectors found plenty of bad parts, including, above, a flap indicator resold after being scrapped; right, a failed turbine blade that caused engine failure, counterfeit brake pads and spacers; and broken gears that were welded and spray-painted to conceal repairs

FAA says 2,000 to 5,000; some aviation-industry estimates put the number at 20,000. Nobody knows, because brokers are unlicensed, unregistered, untrained—and ungoverned by the FAA. They are the broken link in the FAA's regulatory chain. We found that bad brokers would simply close up shop, move to another building or town, and resume business under a new name.

We would seize bad parts from almost every kind of aircraft: helicopter blades, brake components, engines, engine starters, fuel bladders, generators, bearings, speed drives, avionics, cockpit warning lights, landing gears, wheels, combustion liners, parts of helicopter tail rotors, windshields and entire wing and tail assemblies. We would confiscate parts made in basements, garages and weld shops, or from major U.S. manufacturers and from Germany, France, England, New Zealand, Canada, Japan, China, the Philippines, Taiwan or unknown countries. They even showed up on the President's helicopters and in the oxygen and fire-extinguishing systems of Air Force One and Two.

Our five years of investigations took my agents all over the country and occasionally overseas, and filled our evidence rooms with crates of reworked scrap and other counterfeit parts. Yet the FAA would shrug off what it called "suspected unapproved parts" as a paperwork problem. Some manufacturers made parts without the right FAA permits; others sold certified parts that were overruns and didn't have FAA approval. Unapproved parts could be those that were not manufactured or repaired under authorized procedures. One of the largest aviation manufacturers in the world is Pratt & Whitney, maker of one of the most popular jet engines. We would eventually track down a New York broker who had a local machine shop copy a Pratt & Whitney part. The broker had boxes and packaging printed with the Pratt & Whitney label, except that on some of the bogus boxes the Pratt & Whitney eagle was flying into the ground. Those parts were new, but made with the wrong materials.

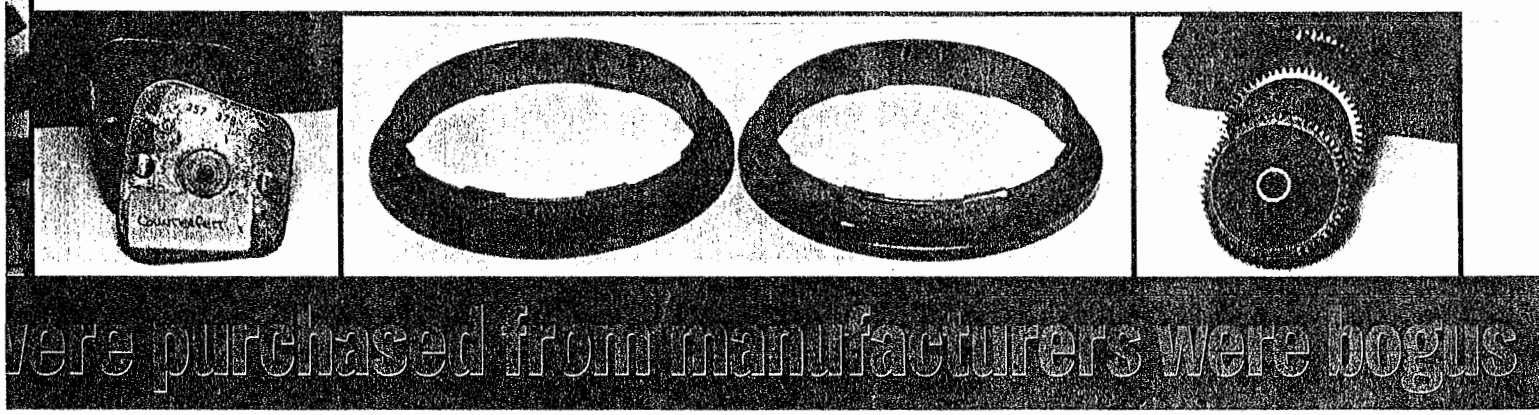
The FAA said these were not safety issues. They were only unapproved parts. It was a label the FAA would rely on to blur the issue, allowing officials to talk about the investigation without appearing to endorse it or offend the repair stations, parts makers or brokers. The FAA wouldn't even use the term bogus parts. Administrator Hinson would tell Congress that "unapproved parts may fit somebody's definition of bogus parts, but we only deal in 'approved' and 'unapproved.'" Associate administrator Anthony Broderick would tell *Air Transport World* in 1994 that "there is no safety problem associated with undocumented parts."

The FAA would insist that bogus parts had never caused a plane to crash, and that there was no increase in the number of bogus parts, just more reports. On my desk in a light blue folder lay a computer printout that clearly indicated the NTSB did not agree. Page after dense page described accidents the NTSB tied to counterfeit parts. For instance, in 1990 a Pan Am Express flight crashed when its nose landing gear jammed "due to the installation of a bogus part by unknown persons."

At a meeting after our investigations began, FAA officials insisted that there was no epidemic of bogus parts. "We have to consider the economic impact to industry," they said, an explanation that echoed through my years as Inspector General. I truly believed a line I started using around the office—"If it's on a plane, it could be bogus." We carted boxes of sample bogus parts around with us, laid them out on tables and urged the airline maintenance people to take a good look. We needed them, we said, to hold on to any similar bogus parts they found. Call us, we pleaded, or call the FAA, but report the bogus parts and *hang on to the evidence.*

Almost immediately, reports of bogus parts soared. They came in because mechanics noticed an odd color, or that metal edges were rough, or that boxes were improperly labeled. When Federal Express mechanics ran across starters they thought were fakes, their quality-control department and our agents tore the $10,000 piece apart and found reworked scrap and car parts.

Suddenly it was clear that bogus parts were out there in great numbers. One of the first steps had to be to determine the scope of the problem. We crafted a series of audits and went to repair stations to count their stock. One of those was the FAA's own Logistics Center, where the agency kept the parts inventory for its own fleet. I felt considerable satisfaction at finding that 39% of the FAA's own spare parts were suspect. Inevitably, this finding outraged the FAA—they argued with us, insisting that our audit of random samples could not be accurate, that what we had found was simply "suspected unapproved parts," not bogus parts. Indignant, they declared they would conduct their own survey of FAA bins—and promptly found more bogus parts than we had.



were purchased from manufacturers were bogus

Our studies of repair-station parts bins were mind boggling: 43% of the parts bought from manufacturers were bogus; a shocking 95% were fraudulent when they came from parts brokers. With brokers, the repair stations had very little chance of buying genuine parts. *Again* the FAA argued that the parts we found were authentic; they were just missing their labels.

In the end, after three years of investigation and 160 convictions [of bogus-parts sellers], the FAA has made few substantial changes in parts oversight. It isn't against the law to make bogus parts; it is only illegal to claim falsely they are certified by the FAA.

BATTLING A DINOSAUR

IN 1981 THE FAA ANNOUNCED A PLAN TO OVERHAUL THE ENTIRE air-traffic-control system. Four years later, nothing had been done. "The air-traffic system is overloaded," declared Congressman James Oberstar of Minnesota. It was the fall of 1985 when he demanded that the FAA begin dealing with the ATC dinosaur. But he

would fail to hold the agency's feet to the fire, and his House Aviation Subcommittee would allow the FAA to waste hundreds of millions of dollars and more than a decade of time.

The agency embarked on a massive effort to design, buy and install a series of complex, computerized systems to replace the straining, watchful eyes and reflexes of the air-traffic-control workers. These were going to be cutting-edge, glittering new systems—the newest generation of whiz-bang electronics, avionics, software and hardware, many of them custom-designed to keep up to date with the needs and desires of American aviation.

Thirteen years and nearly $1 billion later, the FAA had to admit its ambitious program was an utter failure. In 1994, under Hinson, the program was canceled. In spite of the hundreds of millions of dollars spent and the manpower exerted, no new system had been produced, installed or was operating, and every attempt to see the program to its end only prolonged the disaster.

The FAA intended to build a custom computer network from the ground up and consolidate 230 terminal and en route centers into 23 facilities. The system was designed to be phased in over a 20-year period, in a building-block approach with five segments. Through all this, only the first segment, the least complex of all, has been partially completed. The FAA is still years away from fielding any major new equipment. Because of these delays, the FAA has had to come up with hundreds of millions of dollars to keep the antiquated systems at terminal and en route centers—the ones I saw in 1974 (when I visited an en route center as part of my flight training) should already have been phased out or replaced—running for even longer. This equipment was never expected to handle air traffic beyond the late 1980s. Now the FAA says it can last through 2000.

The danger posed by the outdated air-traffic-control system is compounded by a shortage of the special radar needed to help planes cope with bad weather.

Pilots know that weather causes about 40% of aircraft accidents and about 65% of air-traffic delays longer than 15 minutes. Thankfully, technology can defuse the threat. Doppler radar can predict and pinpoint rapid, dramatic shifts in wind by bouncing beacons off different air masses.

Today most people think that Doppler radar wind-shear-detection systems have been installed in every airport. In fact, only 16 are installed and working. Some $350 million worth of parts for Doppler wind-shear-warning radar (promised after a horrible 1985 crash in Dallas) moldered away when truckloads of equipment went to dusty warehouses instead of to the airports most in need. Other systems are installed but haven't been switched on. Seven of the remaining 47 scheduled for production haven't even been delivered.

Yet in the years since the Dallas crash, other wind-shear accidents have cost passenger lives. Two unsolved crashes in Pennsylvania and North Carolina have been tentatively attributed to wind shear that might have been avoided with Doppler radar. After a USAir flight crashed in Charlotte, North Carolina, in July 1994, the NTSB said the delay in installing the radar had cost the lives of 37 onboard. Charlotte was supposed to get the radar system in early 1993. As an airport in the South (where wind shear is particularly common), it was No. 5 on the FAA list. But the inevitable delays, red tape and land squabbles pushed Charlotte to No. 38, leaving the USAir pilots defenseless against the weather.

OUR "BOMBS" GET THROUGH

IN 1993 I LEARNED THAT THE FAA'S ABHORRENCE OF ACTION EXtended to airport security. Plainclothes agents from my office sneaked into some of the 19 busiest airports in the U.S. They wandered around in off-limits areas, seldom challenged by airport or airline employees. We saw other people milling about without proper identification, and they weren't stopped either.

So when I decided in 1995 that we should repeat our security audit, I expected that most of the more obvious breaches would prove to have been corrected. We decided to put particular emphasis on bomb detection this time. But I was bitterly disappointed: in 1995 my agents, together with FAA inspectors, carried fake bombs—strapped to their bodies or in briefcases with marzipan candy or other substances arrayed on boards to look like plastic explosives—and guns and knives through metal detectors. They got into secure areas at the big international airports around the country. They were not stopped 40% of the time.

Early in the summer of 1996, I gathered up the final report on airport security and headed toward the FAA administrator's office.

Hinson and Peña seemed determined to distance

I wasn't looking forward to this meeting. The FAA didn't like me, and had never liked my reports, and if I had missed that message, a fresh signal had just been sent. Secretary Peña had been scheduled to come to this meeting. But then his office must have discovered that the latest airport report was not substantially different from the 1993 study. So he bowed out. The message seemed clear. The Secretary was seeking Washington's best protection—deniability. Peña didn't want to know about the security report. Since I insisted on discussing it, the Secretary had apparently decided not to hear me. Instead, he left it to the FAA administrator.

Hinson's demeanor was familiar: he was his usual easygoing self. I expected the FAA staff and the Secretary's underlings not to like our findings, but I wasn't prepared for the real point of our meeting: they wanted me to bury the report. The Olympic Games were opening in Atlanta that month. The investigation might have miserable results, but "the threat is low," they kept repeat-

ing. What good would it do to upset the public and generate a lot of negative publicity right before the Olympics? I couldn't say an attack was imminent. Still, I knew that the number of attempted bombings had skyrocketed in recent years.

The FAA did try to get airports to do a better job at screening. In January 1996 it warned airline and airport managers at major airports across the country that there were serious problems not only with airline screening processes but also with the airports' security procedures. For example, O'Hare was in 16th place among 19 big international airports. The FAA said its people watched 1,500 bags go through checkpoints, and saw only one opened for closer inspection.

I contended that the security report was so important that not only should it be released immediately, it should be delivered directly to the President. But mine was the minority opinion in that office that day. The FAA, with the backing of the Secretary of Transportation, agreed to send a copy of the document to the National Security Adviser but remained convinced it was best to withhold the report from the public indefinitely. DOT officials insisted that I hold the report; they were requesting that the document be classified.

ENOUGH WAS ENOUGH

I KNEW I COULD NO LONGER STAY IN MY JOB. ONCE AGAIN, THE FAA was manipulating a potential public relations crisis without a thought for the safety issues involved. The Secretary of Transportation's office was assisting the cover-up by insisting the report should be classified, even though the classifiers had already approved it for release. They didn't really care that the airport-security report wouldn't qualify for classification; it would take weeks to figure that out, and by then the Olympics would be over, the goal accomplished, the crisis past.

If I expected change, I knew I had to devise yet another strategy to circumvent the FAA, to find a way to offer my concerns about safety and security directly to the public. I had to resign, even though it meant leaving the airport-security report behind and unprotected. The DOT was adrift, blown wherever the winds of a media event or crisis carried it. The Secretary offered no leadership, no knowledge or understanding, no accountability. The administrator of the FAA was a figurehead. Neither of them heeded NTSB recommendations; neither followed through on the many reports detailing safety problems at the FAA. Looking around the table at the meeting on the security report, I'd felt painfully defeated for the first time. I couldn't continue working in a place where all we did was sit around waiting for people to die.

On July 3, I wrote my letter of resignation but because of the long holiday weekend, I could not find anyone at the White House to take the letter until July 8. A week later, the House Subcommittee on Aviation asked me to explain why I was leaving my job. Transportation Secretary Peña and administrator Hinson were there too, and they seemed determined to distance themselves from any responsibility for the problems at the FAA that I complained about. The Inspector General had never warned him about ValuJet, Peña told the Senators. He had no knowledge, he insisted, of how deep the crisis ran at the discounter, and he found it very troubling that I had implied that alarm bells should have been ringing all over the DOT for months.

It was this kind of revisionist pabulum that had driven me from my job. I explained to the panel that months before, the Secretary's own chief of staff, Ann Bormolini, had at the request of her close personal friend, a ValuJet lobbyist, asked me what I was doing snooping into ValuJet. I told the Senators that in response to this unusual request, I'd written a stern memo outlining what the FAA and my office were doing about ValuJet. Did Peña expect us to believe he had no idea what his chief of staff did every day in the office suite they shared?

Exhausted when I got home, I fell asleep early. It was July 17.

for the problems

R. F. MESTOFT—SABA. LEFT: B. MARKEL—SYGMA. JANSON: CENTER: M. RICHARDS—CONTACT. RIGHT:

HOW SAFE? FAA administrator David Hinson, left, and Transportation Secretary Federico Peña declared ValuJet safe, despite its record. They also delayed Schiavo's critical report on airport security, which was not released until after the Atlanta Olympics

"There's been another crash. It doesn't look good," I heard my husband say through my fog of sleep. "It crashed into the ocean." I got up and followed him to the television. TWA Flight 800 had just plummeted into the Atlantic in a ball of flames off Long Island, and it looked like hundreds of passengers were dead. A familiar, wrenching dread tugged at me. Echoes of ValuJet questions bounced around my head. Had the TWA jet crashed because an incompetent mechanic missed something? Because a bogus part sold to the airline by shady dealers had failed? Or was the plane blown out of the sky because lax security had permitted a bomb to be hidden on the plane or slipped aboard as luggage or cargo?

For two weeks after TWA Flight 800 blew up, I sat through interview after interview on television as the country tried to sort out what could have gone wrong. Yet it was difficult for me to reassure the public when I knew about the FAA's sloppy safety and security record. To be sure, many FAA field employees are hard-working civil servants who have devoted their careers to aviation. They fly all the time, and so do their families and friends. Many FAA inspectors helped my office with investigations, reports and testimony before Congress. Senior FAA officials tried to reach compromises with my office and with the NTSB. But most of the time we pursued opposite goals.

HOW TO BE A SMARTER, SAFER PASSENGER

ALL AIRLINES ARE NOT created equal. The FAA requires the companies to meet minimum safety standards, but much of the diligence beyond that is left to the airlines. Here are some things you can do to help yourself:

1. Avoid old jets. Some major carriers say refurbishing 20-year-old planes renders the aircraft as good as new. I'm not convinced. I am going to stay off old planes belonging to start-ups or any airline short on cash that also farms out maintenance to the lowest bidder. Select those airlines that retire aging aircraft and periodically update their fleets.

2. Steer clear of planes with a past. Here are the planes on my nervous-flyer list: ATR, the French-Italian-made turboprop, is notorious for becoming suddenly difficult to control in extremely cold temperatures. Presumably that problem has been fixed. Personally, I am going to give ATR operators ample time to test their repairs. Embraer 120, a Brazilian-made plane known as the Brasilia, has had its share of troubles—five fatal crashes in the U.S. since 1990. And don't get on Russian-built planes.

3. Stay off all carriers that the FAA has grounded or seriously reprimanded in recent years. Watch the media for announcements.

4. Avoid start-up carriers. Until they have a proven record, it's hard to see who'll be safe and who'll be sorry.

WINDOW OR AISLE? Smoke kills many air-accident victims. An aisle seat near an exit can boost your survival chances

5. Sit where it's safest. True, there is no statistically "safest" place to sit during a plane crash. But there are seats that increase your chances of surviving the aftermath of a crash. Most people who die in plane accidents succumb to smoke inhalation and fumes. The safest place to sit is an aisle seat near an exit so if you have to, you can get out of the plane fast. The best seat is the one with the fewest people and potential obstacles between you and an exit door.

6. Buy and carry your own smoke hood. This is a device that fits over a passenger's head and filters out noxious fumes. The kit is about the size of a child's shoe box, which means it definitely takes up room in your carry-on. The most sophisticated models cost $100 or more, but the gear can be carried on a plane over and over again.

7. Complain about airlines with shoddy security. Report them to the FAA and to your member of Congress. Better yet, call the media—they might report the incident. When you read about an airline with a pattern of shoddy security, stay off that airline.

8. Speak up. Before some of the most tragic, dramatic accidents in recent history, passengers aboard the planes saw something amiss but did not speak up. You paid for a safe plane. Do not be intimidated if flight attendants tell you to mind your own business. Always speak up if you see snow or ice on the wings before takeoff.

9. Do not fly in a hurricane or snowstorm, even if the airport is still open. If the pilot is a seasoned, rational professional, then passengers are not at risk. But if the pilot has get-there-itis, he may overlook safety.

10. If you have service needs or problems, always write down the names of airline employees who have approved or denied your requests or advised you of the carrier's policy concerning something you were guaranteed—say, an empty place next to yours for your infant's safety seat. On countless occasions airline personnel have asked me, "Who told you that?" When I had a name, date and the facts of the conversation, I won the debate.

SILENCING THE WATCHDOG

AFTER I RESIGNED MY POSITION AS INSPECTOR GENERAL AT THE DEPARTMENT of Transportation, the report on airport security that my office had readied for the Secretary, the White House and Congress was suppressed. It didn't matter that the decision had already been made not to classify the report. It was buried for several weeks, until after the Democratic National Convention. When it was finally issued, all the incriminating information about the FAA had been blacked out, including the failure rates and the FAA's response to our findings.

Another report that my office was preparing on FAA inspections was also killed. It was critical of the FAA because the agency had not made improvements in the terrible inspection system we had previously uncovered. Even though an assistant inspector general had already testified to Congress about this report, it was not issued.

FAA administrator Hinson resigned his position in November 1996, and Transportation Secretary Peña has since become Energy Secretary. The job of Inspector General has remained unfilled for more that eight months, and for the time being that office is keeping a lower profile.

Inspector General employees have been barred from talking to the press. The office will no longer get involved in Department of Transportation or FAA policy issues, even though the Inspector General's Act says that is one of the office's purposes. Safety issues are now beyond the scope of the Inspector General's office.

The FAA wanted peace with the Inspector General and the NTSB, but it wanted harmony by persuading us to lay off, to leave its officials to do their jobs as they always had. Planes are not falling out of the sky, the FAA kept saying. Aircraft are not crashing. Stated over and over, this agency mantra was a blanket justification for business as usual.

But in fact, planes were falling out of the sky. After I resigned, I tried to get one final piece of information out of the FAA that had mystified me for years: the monetary value of human life.

"I know very well what you mean," an FAA public-affairs official said in response to a Freedom of Information Act request, "but I don't think you're going to get that from us. Do you expect anybody here to say what is the value we give to human life and then sign off on it and be left open to ridicule for the rest of our lives?" The question angered the official, and the request was denied.

The truth is, no one needs government officials to put a dollar value on his or her life or on the lives of loved ones. We consider ourselves priceless. So should the FAA.

Article of faith fails aero engineers

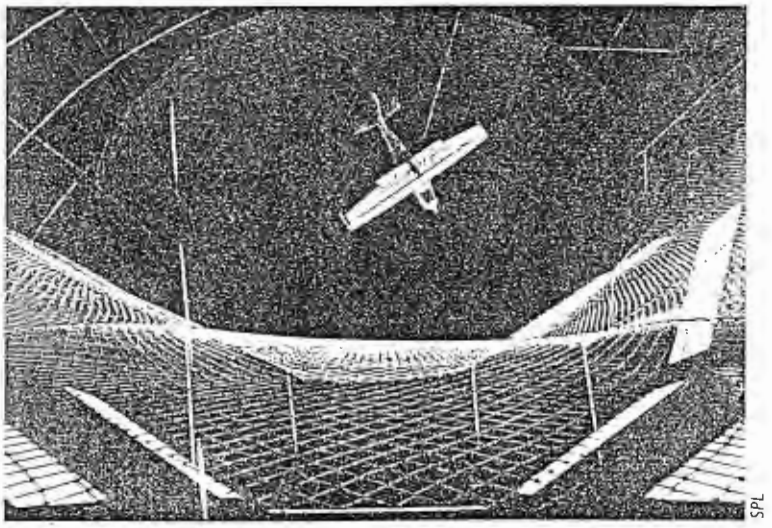
Vincent Kiernan, Washington DC

A KEY equation used in the design of aircraft for the past sixty years is wrong. The two mathematicians who made the discovery think that the error may have caused the tiles on the space shuttle to fall off.

The "law of the wall" is one of the fundamental equations in aircraft engineering. The equation is supposed to calculate the force exerted by moving air on a solid object such as the wing of a plane or the wall of a wind tunnel. The equation says this is a logarithmic decline as the air approaches the surface. But this produces answers that are too low, particularly at high wind speeds.

The equation was first put forward in the 1930s, and it has been used in the design of aircraft ever since. But it has never been verified experimentally. "They didn't have the mathematical tools to figure out a really good test," says Alexandre Chorin of the University of California at Berkeley. Chorin collaborated with Grigory Barenblatt, a visiting mathematician at the university.

Engineers have been aware of nagging discrepancies between the forces they have measured and those predicted by the law, says Chorin. For example, turbulence in a wind tunnel is higher than the law predicts. But engineers assumed that the fault was with the equipment—the wind tunnel wall might have needed polishing, for instance.



Heading for a fall: designers' key equation underestimates turbulence

Because of the gap between theory and observation, Chorin says, aeronautical engineers have never relied exclusively on the law of the wall's predictions when designing aircraft. Engineers always added an extra margin of safety to their designs.

So the discovery does not mean that all planes are unsafe, he says. But he speculates that the error may have been responsible for problems with the space shuttle in its early days, when unexpectedly high turbulence caused its protective tiles to fall off.

Barenblatt adapted mathematical tools from quantum theory and Chorin drew on equations used in fluid mechanics to check the equation. They deduced that the logarithmic law should be replaced with an exponential law—which predicts far greater forces near the wall. These predictions were verified in wind tunnel tests.

Kenny Breuer, professor of aeronautics at the Massachusetts Institute of Technology, agrees that the discovery is likely to have little impact immediately, because aero engineers have relied on wind tunnel tests and the performances of past aircraft in designing existing ones. But changes in the law of the wall could produce more accurate computer models for designing future aircraft. he says. "The law of the wall is a fundamental tenet of turbulence modelling."