

NOTES, NEWS & COMMENTS

Major Aircraft 'Pilot's Perspective' of a Multiple Bird-strike

Boredom and Terror

A conference and training workshop on Wildlife Hazards to Aircraft was sponsored by the United States' Department of Transportation, Federal Aviation Agency, in May 1984, at Charleston, South Carolina. During that conference, among more than 40 papers covering a variety of studies, one presentation, 'Bird-strikes—The Pilot's Perspective', was a first-hand report. It concerned a massive multi-bird strike on one of the world's largest aircraft.

Lt-Col. Ralph Oates, of the US Air Force Reserve, in civilian life a pilot for Piedmont Airlines, began his story by pointing out that pilots practise how to deal with flight emergencies, including loss of engine power and other problems, singly and in groups. He said they thought a lot about what could happen and what could be done to get safely back on the ground. The Air Force and civilian companies spend millions of dollars on simulators, so that pilots can train frequently to keep their capability of response at a high level.

A bird-strike in itself does not necessarily create an emergency. However, the result of a bird-strike or -strikes, depending on where the aircraft is struck, may lead to an emergency.

Pilots make jokes about flying. One that is often repeated is that piloting involves hours and hours and hours of boredom interspersed with moments of stark terror. Col. Oates said that the 17-minutes' flight he would tell about felt like the longest period in his life, which had included about 15,000 hours of flying.

Huge Aircraft and Payload

The flight, which departed from Dover Air Force Base in Delaware at 4.30 p.m. [1630 hrs], involved a routine mission of a C5 Galaxy aircraft to Rhine-Maine US Air Force Base, near Frankfurt, West Germany. Flying time was planned as 7 1/2 hours. The aircraft carried 218,000 pounds (98,840 kg) of fuel, 100,000 pounds (45,400 kg) of cargo, 55 passengers, and a crew of 15. The total take-off weight was 680,000 pounds (308,450 kg). The maximum permitted take-off weight for that model is 712,000 pounds (322,960 kg).

At take-off the ceiling was 100 feet (30 m) and the visibility was between 1/8 and 1/2 mile (200 and 800 m). Because of the heavy take-off weight and the marginal weather (below landing limits), an alternate airport 45 minutes' flying time away was selected for use in the event of trouble. While the aircraft was taxiing out, the crew noted hundreds of [what they assumed to be] gulls on the ground. The comment was made that it should be a good day to fly because the birds were on the ground. Col. Oates had had 3 bird-strikes on C5 aircraft in the previous two years, so he was well aware of bird hazards.

When cleared for take-off, power was applied and at rotation speed the aircraft rotated, left the ground, retracted its undercarriage, and began to climb. Soon afterwards Col. Oates described a collision as feeling as if the aircraft was flying through a bunch of trees. He said 'It shuddered, it shook, the altimeter stopped climbing, the airspeed did not increase, and I was scared'. He received a report that birds had been seen to go into an engine. At that moment there was no emergency except that the aircraft was not climbing or accelerating. The first indication of trouble was an overheat light for engine No. 2 a few moments later. Col. Oates reduced power on that engine and 'severe vibrations began. I knew we had some damage. I didn't know the extent of it; but I felt—because just 10 days

before I had hit a Snow Goose [*Chen hyperborea*] and lost a No. 3 engine—that we had had bird damage'.

Engine on Fire following Bird-strike

'I sent one of my engineers down to scan No. 2 engine. He confirmed that it had sustained some damage and was vibrating on its pylon. His next comment was "No. 4 engine is on fire". I looked around the cockpit and there were no warning lights on; everything looked pretty good up there and the aircraft was climbing slowly and accelerating slowly. Contact with Dover control indicated visibility of 1/2 mile (800 m), so an approach to that airport was begun.'

'I asked for confirmation that No. 4 was on fire and the engineer confirmed that it was in flames. The co-pilot confirmed that observation. By then instruments indicated I was losing power on No. 4 engine. Engine fire on a C5, especially because of the way the engine is designed and suspended from the wing on a pylon, can be disastrous. So can crashing without engine power, so you have to make a selection. You can continue to run the engine to get power or let it burn and burn the wing off. At that time we had 600 feet (180 m) of altitude and were turning over Delaware Bay. I didn't discuss it too long before I decided to shut down No. 4 engine. You can imagine with No. 4 engine shut down and power reduced on No. 2 engine, we now had some problems. We were heavy. We immediately started to jettison fuel and, in a short time, had jettisoned 65 to 68 thousand pounds (29,500 to 30,850 kg).'

'It takes some time to jettison fuel; it is not just gone "right now". You jettison about 9,000 pounds (4,100 kg) per minute. By now we were being vectored back by I.L.S. (Instrument Landing System), and every crew position was busy. On the flight engineer's panel the lights were going on and off, and flashing and dashing; the whole array was lit up like a pinball machine. I figured it was too much for me to look at, so I got back to my instruments which were pretty stable. It was luckily so, because the man back there (the flight engineer), working the panel, kept my power on. The engineers managed to maintain all the systems on the aircraft—hydraulic, electrical, and pneumatic. I did not lose any systems. The co-pilot was busy helping to jettison fuel, working on the landing check-list, and configuring the aircraft for minimum drag which involved a number of procedures.'

'The loadmasters, [when] once they were made aware of what was going on, were busy with the passengers, and, on the after flight-deck, were ensuring that if we had to crash-land or ditch, whichever way it turned out, the passengers would be prepared. They were preparing the passengers for the worst. One navigator was busy with communications, the other was busy on the radar, keeping me clear of land-falls. It really was a total crew effort. With such a very big aeroplane—I think I'm safe in saying it is about the biggest in the world—it takes a crew effort to fly in any situation, normal or emergency.'

'We came around, shot the I.L.S. approach down to minimum altitude, landed—uneventfully, I might add—and taxied clear of the runway. After we got out and looked at what had happened, I think that was when we began to shake and began to be concerned.'

Estimated 50–60 Snow Geese: Team Effort Needed to Survive

'The post-mission survey did indeed find that we had had numerous impacts with migratory waterfowl, Snow

Geese. They estimated that we had hit 50 to 60, from wingtip to wingtip at about 150 feet (45 m) in the air on takeoff. The aircraft wing-span is 222 feet (almost 68 m). The left landing light was knocked off. No. 2 engine was overheated, No. 4 engine fan section had exploded, severing hydraulic lines, and Nos 1 and 3 engines sustained much damage of other kinds. There was also control surface damage and damage to leading-edge slats. There was damage to undercarriage doors and to undercarriage linkage; however, those components still worked normally. The high 'T' tail had escaped damage, so all strikes were at approximately the same level. The successful outcome of this near-disaster is attributed to excellent crew training provided by the military authorities and to outstanding crew discipline.'

In finishing his presentation, Col. Oates again stressed that the success of the flight was realized through a total crew effort, as he said: 'No one person could have brought the aeroplane through'.

After the experience of the above-described incident and several less serious ones, the decision was made to use two air traffic controllers at a time at the Base—one to control aircraft movements, and the other to watch for birds on radar and provide bird information to the aircraft controller.

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Coral Reef Destruction in Ryukyu Islands

The northernmost well-developed coral reefs along the western edges of the Pacific Ocean are in the Ryukyu Islands, south of Japan—particularly in the Yaeyama Group, centred around Ishigaki Island. In 1956, when I spent three months in the Yaeyama Islands, these reefs were in relatively flourishing condition, considering that they are at the northern limits of coral-reef distribution.

At that time Ishigaki Island, though somewhat overpopulated, was ecologically in a relatively stable condition. Active, large-scale disturbance using modern machinery had scarcely begun. Shortly after that time the Ryukyu Group was turned back to Japan, after ten years of American Military Government. Since then, until recently, we have had few reports on environmental matters.

Now, however, there is a proposal from the Prefectural Government to construct a major airport at the city of Shiraho, Ishigaki Island. This would be partly on land and would extend well out onto the coral reef, causing untold destruction, both by physical dredging of reef limestone for fill, and by sedimentation from the dredging and from terrestrial mud from the bulldozing which would be needed for the landward part of the airport. Siltation by suspended solid matter is fatal to living corals.

The residents of Shiraho are organizing an attempt to halt this project, but the proposal has been forwarded to the Japanese Government Ministry of Transportation, the Ministry of Construction, and the Environment Agency. A decision is expected in December. Construction will, it is

said, take about ten years. Outside observers are not very optimistic, but the opposition will do what it can to prevent this major disruption of the quiet life of the Ishigakians and the accompanying environmental perturbation.

Even without the airport, extensive bulldozing and land disturbance for other purposes are having a profoundly deleterious effect on the health of these coral reefs. An observer with past experience of these reefs writes 'I dived all around the Yaeyamas; I quit after 10 days. Everywhere the water is increasingly murky, from all the "land improvement" for agriculture, and all the newly-enlarged ports. It is noisy diving near shore, because of all the bulldozers. The +'s on my map, from the last four years (+ indicating 50% or more living coral) have become zeros. Terrible! Even if the airport isn't built at Shiraho, I have the grim feeling that all the terrestrial activity nearby will eventually do it [the reef] in... It is hard to believe until you actually SEE it...' (The name of my informant is withheld to avoid reprisals and punishment.)

Pressure from foreign and international environmental groups could make a difference.

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Supercities on the Rise

Population growth and migration have 'horrendous implications' for the future of Africa, Asia, and South America, according to Indian urban planner Rashmi Mayur. Mexico City, now the world's largest city, today has 17 million people, and the United Nations projects that it will have 28 million inhabitants by the turn of the century. 'It is already a city characterized by breakdown—of air quality, of traffic control, of crime,' says Mayur in the August issue of *The Futurist* magazine.

Population growth is a major factor in the 'explosion' of cities in the Third World, says Mayur. Some 82 million people were added to them in 1984 alone, more than half of the urban growth in the southern hemisphere being due to migration.

Over 20 million people a year in the less-developed countries leave their homes and move to urban areas. So while the 'supercities' are growing at three to four times the rate of national growth, smaller towns and villages are dying. 'Streams of people are moving into overcrowded cities,' says Mayur, 'although the situation in many of these cities seems even more horrendous' than conditions in the countryside.

If trends in crowded India continue, 'at least 75% of Bombay's population will live in squalid conditions, with

the resultant breakdown of services and amenities, deterioration of living conditions, and decline of the quality of the environment—not to mention social, political, and institutional, collapse,' warns the Bombay-based planner.

But Mayur believes that there are ways of dealing with these tremendous problems. He proposes the creation of a metropolitan administration in each supercity that could 'function independently from the national government'. Subdivisions of the region would be managed by decentralized local bodies, 'so that authority can be delegated as close to the people as possible'.

The first task, according to Mayur, is to 'decongest' the inner city—by banning automobiles and developing urban transit. Modernization of communications systems, recycling waste, and recovering materials—especially non-renewable resources—should also be high on the agenda. 'Third World cities cannot afford to squander scarce and dwindling resources through a policy of laissez-faire,' notes Mayur.

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