This was a survivable accident. The occupiable area of the aircraft was totally intact. The rapid and successful egress of all the occupants may be partially attributed to the fact that nearly all passengers were trained crewmembers and all were airline employees with knowledge of the aircraft, evacuation procedures, and facilities. Serious evacuation problems could have been experienced had this been a routine passenger flight with untrained airline passengers.

The Safety Board found that the bird hazard reduction program at JFK Airport was under routine FAR surveillance as a regular function of the Airport Certification Inspection. To assist the inspectors, 14 CFR 1.39.67 states that the operator "must show that it has established instructions and procedures for the prevention or removal of factors on the airport that attract or may attract birds." While this appears to give the inspector much latitude, the chief of the FAA Eastern Region Airport Certification Program stated that 14 CFR 139 was adequate to implement viable bird hazard reduction programs. Considering the wide range of variables which could affect a bird control program, it is not practical to attempt to make the rule more definitive.

The Safety Board concludes that the complexity of controlling bird populations on or around airports requires ecological and ornithological studies before an effective program can be formulated. An airport certification inspector, who is aeronautically oriented, can determine that birds represent a serious problem at an airport, but he cannot evaluate the technical aspects of the problem to determine which bird reduction program will be effective.

The Safety Board believes that the measures adopted at JFK after the accident represent a strong bird control program and can deal effectively with the immediate problem of birds at the airport.

2.2 CONCLUSIONS

a. Findings

1. The takeoff operation was normal until the sea gulls struck the aircraft.

2. The bird strikes damaged the fan blades in the No. 3 engine.

3. Damage to No. 3 engine's fan assembly resulted in rotor imbalance. As a result of the imbalance, the fan-booster stage blades rubbed on the epoxy microballoon shroud material.

4. Pulverized epoxy microballoon material entered into the No. 3 engine's HPC area, ignited, and caused the compressor case to separate.

5. The FAA and General Electric Company failed to consider the effects of rotor imbalance on the abradable epoxy shroud material during certification.

6. The structural integrity of the No. 3 engine was lost after the compressor case separated.

7. Fire erupted in the right wing and pylon simultaneously with the breakup of No. 3 engine.

8. Deceleration was impaired by loss of tires on the right main landing gear, loss of No. 3 hydraulic system, inability to deploy No. 3 spoiler panels, a wet runway surface, and unavailability of reverse thrust on the No. 3 engine.

9. The aircraft could not be stopped on the runway.

10. The aircraft sustained major structural damage after it left the runway surface.

11. Massive quantities of fuel were released into the fire when the right wing fuel tank was fractured.

12. The flammable material on the aircraft and the aircraft's position near a fuel--saturated storm drain made it virtually impossible to control the fire.

13. The CF6-6 engine was certificated in accordance with existing regulations.

14. The CF6-6 engine certification bird ingestion tests were conducted in compliance with existing regulations. The FAA accepted CF6-6 engine certification data for the certification of the CF6-50 engine.

15. FAA Advisory Circular AC-33-1A contained guidelines for the conduct of bird ingestion tests.

16. The engine manufacturer did not follow the guidelines regarding sizes and numbers. of large birds to be used during ingest ion tests, as outlined -in AC-33-1A, but used alternate procedure:; using fewer birds, which were approved by FAA.

17. Two factory development engines configured with modified rub shroud material retained their total structural integrity when subjected to fan rotor assembly imbalance of 122,000 gram-inches.

18. The postaccident tests performed by the manufacturer were more demanding and more stringent than any in-service bird strikes to date.

19. A bird control system was in effect at JFK Airport.

20. The bird control system did not assure that runway 13R was clear of birds before the takeoff of N1032F.

b. Probable Cause

The National Transportation Safety Board determined that the probable-cause of the accident was the disintegration and subsequent fire in the No. 3 engine when it ingested a large number of sea gulls. Following the disintegration, the aircraft failed to decelerate effectively because: (1) The No. 3 hydraulic system was inoperative, which caused the loss of the No. 2 brake system and braking torque to he reduced SO percent; (2) the No. 3 engine for thrust reverser was inoperative; (3) at least three tires disintegrated; (4) the No. 3 system spoiler panels on each wing could not deploy; and (5) the runway surface was wet.

The following factors contributed to the accident: (1) The bird-control program at John F. Kennedy Airport did not effectively control the bird hazard on the airport; and (2) the Federal Aviation Administration and the General Electric Company failed to consider the effects of rotor imbalance on the abradable epoxy shroud material when the enginewas tested for certification.

3. RECOMMENDATIONS

As a result of the accident, on April 1, 1976, the Safety Board submitted the following recommendations to the Administrator, Federal Aviation Administration:

"1. Require immediate retest of the General Electric CF6 engine to demonstrate its compliance with the complete bird ingestion criteria of AC 33-1A. (Class I--Urgent followup.) (A-76-59.)

"2. Require that any engine modifications necessary to comply with the bird ingestion criteria of AC 33-1A be incorporated into all newly manufactured CF6 engines. (Class II--Priority followup.) (A-76-60.)