3.1 Findings

1. The three-member flightcrew was properly certificated and qualified in accordance with applicable Federal regulations and company requirements.

2. There was no evidence that any medical, behavioral, or physiological factors affected the flightcrew on the day of the accident.

3. Weather was not a factor in the accident.

4. The airplane was properly certificated, equipped, and maintained in accordance with Federal regulations and approved procedures (with the exception of the flight data recorder (FDR) system, which was not functioning properly at the time of the accident).

5. There was no evidence that failures of the airplane's structures or flight control systems contributed to the accident.

6. The compressor surges, or stalls, were caused by the airplane's attitude before impact; no significant loss of engine thrust occurred; engine performance was not a factor in the accident.

7. The airplane pitched up quickly into a stall, recovered briefly from the stall, and stalled again; recovery before ground impact was unlikely once the stall series began.

8. The center of gravity (CG) of the accident airplane was near or even aft of the airplane's aft CG limit.

9. The center of gravity shift resulted in the airplane's trim being mis-set by at least 1.5 units airplane nose up (2.4 minus 0.9 units at 94,119 pounds).

10. The aft center of gravity (CG) location and mistrimmed stabilizer presented the flightcrew with a pitch control problem; however, because the actual CG location could not be determined, the severity of the control problem could not be determined.

11. The mistrim of the airplane (based on the incorrectly loaded cargo) presented the flightcrew with a situation that, without prior training or experience, required exceptional skills and reactions that cannot be expected of a typical line pilot.

12. Training for flightcrews in dealing with misloading, miscalculated center of gravity, and mistrimmed stabilizers would improve the chances for recovery from such situations.

13. Procedures used by Fine Air and Aeromar to prepare and distribute cargo

weight pallet distribution forms and final weight and balance load sheets were inadequate to ensure that these documents correctly reflected the true loading of the accident airplane.

14. The security guard was not aware of the airplane change, and he instructed Aeromar loaders to load the airplane in accordance with the weight distribution form he possessed for N30UA.

15. The accident airplane (N27UA) was initially loaded according to Fine Air's load distribution for N30UA; further, the final load configuration did not match the planned load for either airplane.

16. The Aeromar cargo loading supervisor failed to ensure that the pallets were loaded according to an approved load plan (in this case neither load plan was followed) and failed to confirm that the cargo was properly restrained.

17. A significant shift of cargo rearward at or before rotation did not occur and was not the cause of the initial extreme pitch up at rotation; although, cargo compression or shifting might have exacerbated the pitch-up moment as the pitch increased.

18. The difficult work environment of cargo loaders has the potential to cause loading errors if the loading process is not adequately structured to compensate for the detrimental environmental effects on human performance.

19. Fine Air failed to exercise adequate operational control of loading operations conducted by Aeromar on the accident flight as required by Part 121, the operational control terms of its lease agreement with Aeromar, and its own operating policy.

20. Fine Air's failure to exercise adequate operational control was causal to the accident by creating an operational environment in which cargo was loaded into Fine Air airplanes without verification of pallet weights and proper load distribution and by fostering a management philosophy that allowed airplanes to be dispatched without verification and control procedures in place to ensure that load-related, flight safety-critical tasks had been accomplished.

21. The loaders who loaded the accident airplane were not aware of the potentially catastrophic consequences of misloading the airplane and failing to properly secure cargo, and this contributed to the accident.

22. Formal training is necessary to ensure that cargo handling personnel receive standardized instruction on safety-critical aspects of the loading process.

23. Although the flight engineer was required to ensure that all cargo pallet locks were locked, company operating procedures and practices in Miami

International Airport hindered him from accomplishing this task.

24. If the flightcrew had had an independent method for verifying the accident airplane's actual weight and balance and gross weight in the cockpit, it might have alerted them to the loading anomalies, and might have prevented the accident.

25. The Federal Aviation Administration inspectors assigned to Fine Air failed to ensure that known deficiencies in Fine Air's cargo operations were corrected.

26. The entire sequence of cargo loading operations, from preparation of the pallets/containers through the information provided to flightcrews, has a direct effect on flight safety and should not be neglected by the FAA surveillance program, particularly for the cargo air carriers operating under 14 Code of Federal Regulations Part 121.

27. The Miami Flight Standards District Office (FSDO) lacked clear management policies to ensure that sufficient and appropriate surveillance was conducted and that surveillance results were acted upon; further, the FSDO was not aggressive in its inspection and management of the Fine Air certificate and this contributed to the accident.

28. The deficiencies found in the Miami Flight Standard District Office's oversight of Fine Air and other carriers in its jurisdiction are indicative of a broader failure of the Federal Aviation Administration to adequately monitor air carriers, especially supplemental cargo carriers, in which operational problems had been identified.

29. National aviation safety inspection program and regional aviation safety inspection program inspections are not adequately identifying and addressing systemic safety problems that exist in air carrier operations at the time the inspections are conducted.

30. Current Federal Aviation Administration personnel and budget resources may not be sufficient to ensure that the quality of air carrier surveillance will improve.

31. Permanent documentation of flight data recorder computer readouts is needed to later verify that such readouts have been properly accomplished.

32. Current and proposed inspection intervals for flight data recorders (at each "C" check) are not adequate because of fleet utilization variables at many carriers.

33. Federal Aviation Administration principal avionics inspectors may lack the experience and training to provide adequate oversight of flight data recorder

(FDR) installations and continued FDR airworthiness requirements.

34. Fine Air's continuing analysis and surveillance program was not as rigorous as its program description indicated and failed to result in the correction of systemic maintenance deficiencies.

35. Fine Air's maintenance logs for the accident airplane suggest a practice of logging significant maintenance discrepancies on return flights to Miami, where repairs were completed, and that such practices may be widespread in the industry.

36. Although the principal maintenance inspector (PMI) noted a pattern of logging entries on return flights to Miami and expressed his concerns to Fine Air management, no further action was taken either by the PMI or Fine Air management to address this problem.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident, which resulted from the airplane being misloaded to produce a more aft center of gravity and a correspondingly incorrect stabilizer trim setting that precipitated an extreme pitch-up at rotation, was (1) the failure of Fine Air to exercise operational control over the cargo loading process; and (2) the failure of Aeromar to load the airplane as specified by Fine Air. Contributing to the accident was the failure of the FAA to adequately monitor Fine Air's operational control responsibilities for cargo loading and the failure of the FAA to ensure that known cargo-related deficiencies were corrected at Fine Air.