National Transportation Safety Board
Aviation Accident Final Report

Location:	HYANNIS, MA	**Accident Number:**	NYC00FA092
Date & Time:	03/17/2000, 1802 EST	**Registration:**	N814M
Aircraft:	Dassault DA-900	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Minor, 4 None
Flight Conducted Under:	Part 91: General Aviation - Executive/Corporate		

Analysis

Prior to departure, the flight crew confirmed that the 'windy, rainy and stormy' weather would move out of New York and proceed northeast up into the Hyannis area. Arriving in the Hyannis Airport area, at night, the crew received the ATIS, which stated that winds were from 040 degrees at 20 knots, gusts to 33 knots. The ILS Runway 15 approach was in use. Braking action was reported poor by a Cessna 402, and all surfaces were covered with a patchy thin layer of snow and ice. The PIC determined that the tailwind component for the ILS Runway 15 approach would have exceeded the airplane's limitations, and requested the ILS Runway 24 approach. The airplane touched down about 2,640 feet beyond the approach end of the 5,425-foot long runway. The airplane impacted the localizer antenna, departed the end of the runway, went through a chain link fence, crossed a two-lane road, struck three vehicles on the road, continued into a parking lot, and impacted concrete barriers and two parked vehicles. Examination of the airplane revealed a takeoff and landing card (TOLD) on the instrument panel. Written on the card was the landing distance calculated as 3,050 feet and a notation of 'BA POOR'. At the time of the accident the runway was covered with a 1/2-inch accumulation of ice and snow. According to the Dassault DA-900 Airplane Flight Manual (AFM) Limitations Section, the maximum allowable tailwind component at landing was 10 knots. According to the DA-900 Performance Manual, the maximum safe crosswind on icy runways was 5 knots. The manual also stated, 'For icy runway conditions, landing distance is 3 times the landing distance on dry runway.' Using the factor of 3 and a 10 knot tailwind, a landing distance was computed to be about 10,800 feet. No factors were published for a 20 knot tailwind.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flightcrew's inadequate coordination and improper weather evaluation. Also causal was the captain's improper decision to continue the approach to a runway with insufficient length and his failure to obtain the proper touch down point on the runway. Factors in the accident were the tailwind conditions and the ice and snow-covered runway.

Findings

Occurrence #1: OVERRUN
Phase of Operation: LANDING - ROLL

Findings
1. (F) WEATHER CONDITION - TAILWIND
2. (C) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
3. LIGHT CONDITION - NIGHT
4. (C) CREW/GROUP COORDINATION - INADEQUATE - FLIGHTCREW
5. (F) AIRPORT FACILITIES,RUNWAY/LANDING AREA CONDITION - ICY
6. (C) PROPER TOUCHDOWN POINT - NOT OBTAINED - PILOT IN COMMAND
7. (C) WEATHER EVALUATION - IMPROPER - FLIGHTCREW

Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: LANDING - ROLL

Findings
8. OBJECT - APPROACH LIGHT/NAVAID
9. OBJECT - FENCE
10. OBJECT - VEHICLE
11. OBJECT - POLE

Factual Information

HISTORY OF FLIGHT

On March 17, 2000, about 1802 Eastern Standard Time, a Dassault DA-900, N814M, operated by BP Amoco Corporation, was substantially damaged when it overran the runway while landing at Barnstable Municipal-Boardman/Polando Field (HYA), Hyannis, Massachusetts. The two certificated airline transport pilots and two passengers were not injured. Two occupants of vehicles on a public road received minor injures. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the executive/corporate flight that originated from the La Guardia Airport (LGA), Flushing, New York. The flight was conducted under 14 CFR Part 91.

According to the pilot-in-command (PIC), the VOR Runway 6 approach to HYA had been briefed prior to departing LGA. Arriving in the Hyannis area, the crew received the ATIS "Mike", issued at 1650, which stated that winds were from 040 degrees true at 20 knots, gusts to 33 knots, 1/2 statute mile visibility, snow and freezing fog. Cloud conditions were 900 feet broken, 1,400 feet broken, and 2,000 feet overcast. The ILS Runway 15 approach was in use.

The crew determined that the visibility for the VOR Runway 6 approach was below minimums, and the PIC determined that the tailwind component for the ILS Runway 15 approach would have exceeded the airplane's limitations. The PIC requested the ILS Runway 24 approach, and the airplane was then vectored to, and cleared for that approach.

During an interview, the PIC stated that he made the decision during the approach that he would land the airplane if the braking action was reported as fair, and discontinue the approach if it was reported as poor.

The PIC further stated that the airplane was configured to land, and that he flew the glideslope to the runway. After touchdown, he applied maximum reverse thrust and braking, and called for the "air brakes." As the airplane continued down the runway, he noticed an acceleration, and a lack of braking effectiveness. However, he decided not to attempt a go-around, but opted to "rid[e] it out to the end."

A Federal Aviation Administration (FAA) inspector, who arrived at the airport shortly after the accident, stated that the airplane departed the end of the runway, slid through the Runway 24 localizer antenna array and a chain link fence. With a 200-foot section of the chain link fence attached to the number two engine pylon, the airplane crossed a two-lane road and struck three vehicles that were traveling on the road. The airplane continued into a parking lot, and impacted four concrete parking barriers. It then impacted three cement parking lot light fixture bases and two parked vehicles, before coming to a stop.

During the overrun, the airplane's left and right wing fuel tanks ruptured. The Massachusetts Department of Environmental Protection estimated that approximately 1,200 gallons of Jet-A fuel spilled from the airplane after it came to a stop.

A witness, who was standing outside of the airport operations building, stated that he had an unobstructed view of Runway 24 when he observed the accident airplane approach the runway. The witness estimated that the airplane touched down at a point 2,500 beyond the approach end. The airplane continued another 1,500 feet until the thrust reverser was deployed. As the airplane passed the operations building, the speed was excessive for the remaining runway.

The witness then realized that the airplane was not going to stop on the airport property and proceeded to a rescue vehicle.

The FAA inspector and a representative from the Commonwealth of Massachusetts Aeronautics Commission examined Runway 24 after the accident. They observed one set of tire tracks in the snow on the runway that correlated to the ground track of the accident airplane. The tire tracks began about 2,640 feet from the approach end of the runway, which was about 2,785 feet from the departure end.

According to the passenger seated in the main cabin of the airplane, he could see snow outside the window and it was extremely windy, as the airplane passed though 3,000 feet in it's decent to HYA. As the airplane passed through 1,500 feet, he could see the ground continuously and the airplane was "fighting" to stay level. The airplane was at a very steep angle of decent until touchdown. As the airplane was landing, he could see snow covering the runway and the airplane was not decelerating. The passenger did not recall where the airplane touched down on the runway, or if he had heard the thrust reversers or seen the wing spoilers. The passenger did recall that there was a heavy exhaust noise after the landing.

A pilot, who was flying a Piper PA-31 the night of the accident, stated that he had flown from HYA about 1715, and returned to the airport area around 1745. He recalled that the weather conditions were, winds from 070 degrees at 28 knots and gusting. The visibility was about 2 1/2 miles, with an indefinite ceiling. The decision was made to land on Runway 6. After landing, the airplane was turned off of the runway at taxiway Bravo due to the high winds slowing the airplane down after landing. The pilot did not recall if he made a braking action report to the tower, but estimated the conditions as poor, due to the depth of snow and ice on the runway.

Excerpts of the cockpit voice recorder (CVR) transcript revealed the following:

At the beginning of the transcribed recording, HYA ATIS weather information "Mike" was repeated three times on the CAM (cockpit area mike) and the co-pilot's channel.

At 1732:42, the ATIS recording stated, "Hyannis tower information Mike two one five zero weather. the wind zero four zero at two zero gusting three three. visibility one half mile with snow and freezing fog. ceiling's broken at nine hundred broken at one thousand four hundred overcast at two thousand. temperature minus one. dew point minus two. altimeter two niner niner seven. ILS approach runway one five's in use. departing traffic runway six. bird activity on and in the vicinity of the airport. clearance delivery frequency's out of service utilize ground. breaking action is re- reported poor by a Cessna four oh two. all s- surfaces are covered with a patchy thin layer of snow and ice. there are delays to Boston and La Guardia. advise on initial contact. you have Mike."

At 1749:36, the pilot stated, "I don't know if you get time to check with the tower to see what the winds are right now. I wouldn't want to get a surprise after we set up on the..."

At 1749:43, the co-pilot stated, "Okay."

At 1749:45, the pilot stated, "...on the approach you know and have the winds right down the."

At 1750:01, the co-pilot stated on the radio, "yes sir we-re gonna be with you in just a second. Could you give me your current winds please."

At 1750:11, the tower controller stated, "wind ah zero one zero at ah two five."

At 1750:16, the co-pilot stated on the radio, "zero one zero at two five. How's that runway now?"

At 1750:22, the tower controller stated, "ah no one's ah landed ah. the last braking action report I received was at ah two zero four one * zulu ah braking action was reported poor by a Cessna four oh two. It's ah looks like it appear to be a little more snow on the runway now."

At 1750:43, the co-pilot stated, "all right he said ah the winds are zero one zero at twenty five now. braking action was ah."

At 1750:50, the pilot stated, "that's not gonna work. that's a big tailwind on landing."

At 1750:54, the pilot stated, "two four would almost work better wouldn't it?"

At 1751:11, the pilot stated, "we're gonna have to go around to two four@. I mean I-I that's less tailwind component on two four then would you agree?"

At 1751:18, the co-pilot stated, "yeah # you know. one five. you're gonna just..."

At 1751:22, the pilot stated, "okay which*..."

At 1751:23, the co-pilot stated, "...go over the airport? but see that's you*."

At 1751:25, the pilot stated, "...yeah why don't you go ahead and ask ah approach to set us up with that please."

At 1751:29, the co-pilot stated, "two four? okay."

At 1751:31, the pilot stated, "I don't see how we can do it w-with that much tailwind on landing."

The co- pilot replied, "okay."

At 1751:38, the co-pilot stated on the radio, "yes sir I wonder if you'd set us up with the ILS to runway two four ah it looks like the winds ah not in our favor on runway one five."

At 1751:46, the approach controller stated, "eight one four Mike roger turn right zero niner zero vectors ILS two four final approach course."

At 1751:54, the co-pilot stated, "I'll get you set up in one second." The pilot responded, "okay."

At 1752:02, the pilot stated, "that sound like the right thing to do to you."

At 1752:04, the co-pilot stated, "yeah * your right it's you know I was hoping for a little better but i guess it's not going to work is it."

At 1752:12, the co-pilot stated, "I'm gonna get back with it in just a second. I'm gonna get the ah." The pilot responded, "okay."

At 1752:33, the pilot stated, "I'd say that's a little less than ten knots of ah tailwind on on landing."

At 1754:22, the co-pilot stated, "standby one second I'm gonna get you some."

At 1754:31, the co-pilot stated on the radio, "okay we didn't like the winds. we're gonna switch around to the ILS to runway two four. What have you got for braking action and winds now?"

At 1754:40, the tower controller stated, "the wind ah zero two zero at two six gusts to three four...ah no braking action reports ah received for runway ah two four."

At 1754:57, the copilot stated, "okay he's got zero two zero. # that's gonna be a direct tailwind right there on runway."

At 1755:02, the pilot stated, "what what'd he call it now?"

At 1755:04, the co-pilot stated, "he's calling it zero two zero." The pilot responded, "okaay."

At 1755:08, the co-pilot stated, "see that's gonna be a direct tailwind."

At 1755:09, the pilot stated, "we're lan-landing on runway two four right?"

At 1755:11, the co-pilot stated, "yeah but see that's that's not good right? cause this is gonna be more of a tailwind there."

At 1755:18, the co-pilot stated on the radio, "and for eight one four Mike. Say again the ah the wind."

At 1755:24, the tower controller stated, "wind zero two zero at two six gusts to three four."

At 1755:29, the co-pilot stated, "zero two zero at two six and see that's more of a tailwind."

At 1755:32, the pilot stated, "I don't know@. it looks like it's if you look at one five it..."

At 1755:36, the co-pilot stated, "zero two zero."

At 1755:37, the pilot stated, "...I understand. zero t-. it's almost a-a direct tailwind. I got twenty five hundred for fifteen hundred. The co-pilot responded, "okay."

At 1755:49, the pilot stated, "slow it up here. do you wanna try to figure the component real quick?"

At 1755:54, the co-pilot stated, "#. I don't even know where the box is."

At 1756:09, the pilot stated, "just look at the compass rose there. it's not a direct tailwind."

At 1756:12, the co-pilot stated, "yeah but. okay well. zero two...at well that's got a component there."

At 1756:19, the pilot stated, "it's got I know it's got a tailwind component."

At 1756:22, the co-pilot stated, "okay one five."

At 1756:23, the pilot stated, "...but I'm guessing it's less than ten."

At 1757:22, the co-pilot stated, "ah two six one well. yeah you got ninety degrees little bit more***."

At 1757:44, the co-pilot stated, "all right @ I think you're right."

At 1757:45, the pilot stated, "then okay arm the approach for me."

At 1758:37, the tower controller stated, "Falcon eight one four Mike Hyannis tower. runway two four clear to land. ah last braking action report received was by a vehicle ah braking action was reported fair."

At 1758:46, the co-pilot stated, "eight one four Mike and your wind right now please."

At 1758:52, the tower controller stated, "wind ah zero one zero at two two."

At 1758:56, the co-pilot stated, "zero one zero at two two. eight one four Mike."

At 1758:57, the pilot stated, "that's got to be less than ten knots. okay."

At 1758:58, the co-pilot stated, "all right I'll buy that."

At 1800:01, the co-pilot stated, "I got a ground speed of about hundred and fifty nine..."

At 1800:04, the pilot stated, "okay thank you."

At 1800:44, the co-pilot stated, "okay ground speed's one sixty."

At 1800:48, the pilot stated, "okay."

At 1801:14, the co-pilot stated, "I don't like it."

About 4 seconds later, the CVR recording revealed a sound similar to touchdown, followed by the captain calling for the "auto-brakes."

At 1801:32, the CVR recorded a sound similar to several impacts.

In a written statement, the first officer revealed that he and the captain reviewed weather information during a lunch break. The weather supported information that he had seen on the Weather Channel and information that was obtained from a satellite weather service. The flight crew then confirmed that the "windy, rainy and stormy" weather would move out of New York and proceed northeast up the Atlantic coast, into the HYA and Boston areas. The first officer also stated he had discussed with the accident flight's captain, a weather situation on a previous flight that was similar to what was occurring the day of the accident. On that flight, which was from Dallas, Texas to HYA, a decision was made to land in Providence, Rhode Island, rather than HYA, due to the stormy conditions. The captain replied to the first officer, "...we should not inconvenience our passenger because of our problems." The captain then asked what the driving time would be from Providence, Rhode Island, to HYA.

The accident occurred during the hours of darkness, approximately 41 degrees, 40 minutes north latitude, and 70 degrees, 16 minutes west longitude.

FLIGHT CREW INFORMATION

Captain

The captain held an airline transport certificate with a rating for airplane multi-engine land, and commercial privileges for airplane single engine land. In addition, the captain was type rated in the Dassault DA-50, Lear Jet, Gulfstream G-IV, Cessna CE-650, and Cessna CE-500. The captain reported his total flying experience in airplanes was 13,200 hours. He also reported that he had accumulated about 380 hours in the Dassault DA-900, of which about 63 hours were in the last 90 days.

The captain's most recent FAA first class medical certificate was issued on December 17, 1999.

The captain received his initial Dassault DA-900 training between February 22 and March 11, 1999. The course was taught by Flight Safety, Teterboro Learning Center, Teterboro, New Jersey.

According to a representative of the operator, he recalled that the captain's last attended CRM training course was about 1986.

According to company records, the captain had flown a Dassault DA-900 a total of 88.4 hours in the last 90 days, and 2.2 hours in the last 60 days.

First Officer

The first officer held an airline transport certificate with a rating for airplane multi-engine land. The first officer also held a commercial certificate with privileges for airplane single engine land, and rotorcraft. In addition, the first officer was type rated in the Dassault DA-50, Cessna CE-500, Gulfstream G-1159, Gulfstream G-IV, Sikorsky SK-61, and Boeing BV-107. The first officer reported his total flying experience in all aircraft was 8,760 hours. He also reported that he had accumulated a total of 80 hours in make and model, of which 73 were in the last 90 days.

The first officer received his initial Dassault DA-900 training between November 29 and December 16, 1999. The course was taught by Flight Safety, Teterboro Learning Center, Teterboro, New Jersey.

The first officer's most recent FAA first class medical certificate was issued on November 19, 1999.

According to a representative of the operator, he recalled that the first officer's last attended CRM training course was about 1986.

METEOROLOGICAL INFORMATION

The weather recorded at HYA, at 1756 was, winds from 020 degrees true at 21 knots, gusts to 34 knots; visibility 3/4 statute mile, light snow and mist; clouds 800 feet scattered, 1,300 feet broken, and 2,300 feet overcast.

A special weather observation was conducted by the air traffic control tower at 1804. It included winds from 010 degrees true at 23 knots, gusts to 34 knots; visibility 1-1/4 statute miles, light snow and mist; clouds 900 feet scattered and 2,100 feet overcast.

The winds recorded at 1800, by Cape Cod Community College, which was located about 3 miles to the northwest of HYA, were from the northeast at 17 knots, with a "Hi Wind Speed" of 34 knots.

AERODROME INFORMATION

Runway 24 at HYA was a 5,425 foot long, 150 foot wide, hard surfaced asphalt transverse grooved runway. A 139 foot long blast pad was also located at the departure end of Runway 24. At the time of the accident the runway was covered with a 1/2 inch accumulation of ice and snow.

According to HYA records, two NOTAM's were issued on March 17, 2000, that referenced the condition of the runway surfaces. The first NOTAM was issued at 1123 and indicated a "thin layer of slush on all surfaces BRAG [braking action good]." The NOTAM was cancelled at 1603. The second NOTAM, issued at 1603, indicated, "Patchy thin layer snow and ice all surfaces BRAF [braking action fair] by a C-402." The NOTAM was cancelled at 2319.

FLIGHT RECORDERS

Cockpit Voice Recorder

The airplane was equipped with a Fairchild A100S, solid state CVR. The CVR was transported to the Safety Board, Office of Research and Engineering, on April 3, 2000. The CVR group convened on April 5, 2000. A transcript was prepared for the last 12 minutes and 24 seconds of the 30-minute 20-second recording.

Digital Flight Data Recorder

The digital flight data recorder (DFDR), a Loral Fairchild Data Systems model S800-2001-01 (F1000) solid-state flight data recorder (SSFDR) was removed from the airplane after the accident. The recorder was sent to the Safety Board's flight recorder laboratory, where Vehicle Recorders Division personnel conducted a readout and evaluation.

The readout of the SSFDR was accomplished using the laboratory's readout hardware and associated software. The contents of the recorder were extracted without difficulty. However, subsequent examination of the data indicated that the entire FDR memory was recorded as zeros. No synchronization words were recorded. Neither the accident sequence nor any airplane operation was recorded.

The extracted compressed data file was sent to the FDR manufacturer for examination. The manufacturer confirmed the findings of the Safety Board and found the extracted data to be comprised of zeros.

In addition, the manufacturer simulated the airplane's FDR system on a test bed. The purpose of the simulation was to replicate the extracted file from the FDR. The manufacturer attempted various scenarios and failures to record all zeros on the FDR. The manufacturer determined, from the test, that the FADU might have sent the FDR a serial stream of zeros. The manufacturer also indicated that such action by the FDAU should have resulted in the illumination of the "FDR Fail" byte light in the cockpit.

After receiving the FDR manufacturer results, the Safety Board requested the airplane's FDAU unit to be forwarded to its manufacturer. Using a test bench, the FDAU manufacturer was able to determine that the FDAU's processor had failed. The manufacturer indicated that the failure of the processor would result in the FDAU sending only zeros to the FDR.

WRECKAGE INFORMATION

The wreckage was examined on March 18, 2000. The airplane had been recovered from the accident site the previous night onto a flat bed trailer truck and transported to a remote area of the airport.

The forward section of the airplane exhibited impact damage to the nose cone. Red paint transfer, similar to the color of the paint applied to the localizer antenna, was observed on the forward section of the airplane.

The fuselage had numerous gouges and punctures along the entire length.

The right wing was buckled upward about 6 inches at the aft end wing root. The right wing inboard trailing edge flap was buckled upward about 10 inches at its center point. The outboard trailing edge flap was dented along the trailing edge. About a 72 inch long section of the right wing outboard leading edge slat remained on the wing and was hanging downward. The inboard leading edge slat had a compression dent about 60 inches from the wing root.

The left wing was buckled upward about 6 inches at the aft end wing root. The left wing inboard trailing edge flap was buckled upward about 10 inches at its center point. The outboard trailing edge flap was dented along the trailing edge. The left wing outboard and inboard leading edge slats remained attached to the wing and was damaged with compression dents of various sizes along the entire length.

The main landing gear and nose gear assemblies were extended and pivoted rearward.

The right engine was dented at the 2 O'clock and 8 O'clock positions of the nacelle inlet lip.

The left-hand engine was dented at the 2 O'clock position of the nacelle inlet lip. The center engine fuselage mounting pylon cover was compressed rearward about 10 inches.

TOXICOLOGY INFORMATION

Post accident drug and alcohol tests were not administered to the pilots after the accident.

CREW RESOURCE MANAGEMENT TRAINING

FAA Advisory Circular 120-51C presented guidelines for developing, implementing, reinforcing, and assessing crew resource management (CRM) training programs for flight crewmembers and other personnel essential to flight safety. These programs were designed to become an integral part of training and operations. All Part 121 operators were required by regulations to provide CRM training for pilots.

Part 91 did not require training in CRM.

ADDITIONAL INFORMATION

According to the Dassault DA-900 Airplane Flight Manual (AFM) Limitations Section, maximum allowable tailwind component for landing was listed as 10 knots.

According to the Dassault DA-900 Performance Manual, a dedicated supplement was available concerning landing performance information for contaminated runways.

The supplement stated:

"As operation on contaminated runways are exceptional, the determination of maximum landing weight from this supplement does not yield the same level of safety as on a dry runway, because the landing field length (landing distance D x 1.67) is not taken into account."

The maximum safe crosswind on icy runway was listed as 5 knots.

Maximum equivalent water depth of precipitation was listed as 20 mm (0.79 in.).

The manual defined a contaminated runway as "a runway where more than 25 % of the runway surface area, within the required length and width being used, is covered by standing slush or snow more than 3 mm (0.125 in.) deep." An icy runway was defined as, "a runway surface conditions where braking action is expected to be very low, due to presence of wet ice."

The manual also stated, "For icy runway conditions, landing distance is 3 times the landing distance on dry runway."

According to the operator's Aircraft Operations Manual (AOM), Standard Operating Procedures section, "The flightcrew shall obtain and record the latest destination weather prior to landing. Serious consideration should be given to landing if any of the following conditions prevail:

a) Heavy falling snow. b) Heavy icing. c) Freezing rain or d) Thunderstorms at or adjacent to airport. e) Variable or exceedingly high wind conditions. f) Snow, slush, or ice on the runway."

The AOM also provided limitation information on wind and airfield runway requirements.

The wind limitations considered that the "Aircraft should not takeoff or land in crosswind or downwind components greater than those recommended in the limitations section of the AFM. The PIC is responsible for ensuring that landings or takeoffs are attempted only within safe crosswind limitations, giving due consideration of aircraft capabilities, aircrew experience,

runway conditions, and existing weather."

The airfield runway requirements limitations considered that the "Gross weight should be adjusted so that takeoff /landing runway requirements as specified by the AFM are met. In addition, takeoff and landing distance requirements will be adjusted upward on slick/contaminated runways..."

The AOM described a Contaminated Runway as "The takeoff/landing portion of the runway is more than 25% covered by standing water. Patch of snow, ice, and/or/ slush on the takeoff/landing portion of the runway are also considered runway contaminates. Braking action, if reported, is "fair" or "good"." The manual stipulated that a factor of 1.50 should be added to the landing distance.

The AOM described a Slippery Runway as "Standing water, snow, ice patches, and/or slush cover 50% or more of the takeoff/landing portion of the runway. Braking action, if reported, is "Poor"." The manual stipulated that a factor of 2.00 should be added to the landing distance.

Landing Data

When the airplane was examined after the accident, a takeoff and landing card (TOLD card) was observed placed on the instrument panel. The TOLD card was placed between the landing gear emergency unlock lever, and the copilot's RMI. The TOLD card was marked with approach speeds, landing distances, engine parameter settings, weather, and airport information. The approach speed was calculated as 138 knots, the "Ref" speed was calculated as 122 knots. The landing weight was calculated as 36,500 pounds. The landing distance was calculated as 3,050 feet. Included in the airport information was a notation of "BA POOR". The weather information recorded on the TOLD card was the HYA tower information "Mike."

According to the AFM performance manual, the estimated uncorrected landing distance, on a dry runway, with a 22 knot headwind, was approximately 2,600 feet. The estimated uncorrected landing distance, on a dry runway, with a 10 knot tailwind, was approximately 3,600 feet.

According to the AFM performance manual, supplement 1, the estimated landing distance on a contaminated runway, with a 22 knot headwind, was approximately 5,400 feet. The estimated the estimated landing distance on a contaminated runway, with a 10 knot tailwind, was approximately 8,700 feet.

Using the supplement, "For icy runway conditions," multiplying the uncorrected distance by a factor of 3, with a 10 knot tailwind, would have equaled approximately 10,800 feet.

According to the operator's AOM, and using the landing distance of 3,050 feet computed by the flightcrew, the corrected landing distance on a runway where the braking action was reported as "fair," was approximately 4,575 feet. The corrected landing distance on a runway where the braking action was reported as "poor," was approximately 6,100 feet.

No factors were published by the manufacturer or the operator to compute a landing distance incorporating a 22 knot tailwind.

A review of flight planning charts revealed that there were 2 airports within a 50 nautical mile radius and 9 airports within a 200 nautical mile radius of HYA, which had a runway length in excess of 9,000 feet.

The airplane wreckage was released to a representative of the operator on March 18, 2000.

Pilot Information

Certificate:	Airline Transport; Commercial	**Age:**	50, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last Medical Exam:**	12/17/1999
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	13200 hours (Total, all aircraft), 380 hours (Total, this make and model), 10400 hours (Pilot In Command, all aircraft), 65 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Dassault	**Registration:**	N814M
Model/Series:	DA-900 DA-900	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Transport	**Serial Number:**	155
Landing Gear Type:	Retractable - Tricycle	**Seats:**	15
Date/Type of Last Inspection:	12/16/1999, Continuous Airworthiness	**Certified Max Gross Wt.:**	46500 lbs
Time Since Last Inspection:	190 Hours	**Engines:**	3 Turbo Jet
Airframe Total Time:	2293 Hours	**Engine Manufacturer:**	Honeywell
ELT:	Installed, not activated	**Engine Model/Series:**	TFE731-5BR-1C
Registered Owner:	BP AMOCO CORPORATION	**Rated Power:**	3500 lbs
Operator:	BP AMOCO CORPORATION	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	HYA, 55 ft msl	**Observation Time:**	1756 EST
Distance from Accident Site:	0 Nautical Miles	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Scattered / 800 ft agl	**Temperature/Dew Point:**	-1°C / -2°C
Lowest Ceiling:	Broken / 1300 ft agl	**Visibility**	0.75 Miles
Wind Speed/Gusts, Direction:	21 knots/ 34 knots, 20°	**Visibility (RVR):**	0 ft
Altimeter Setting:	30 inches Hg	**Visibility (RVV):**	0 Miles
Precipitation and Obscuration:			
Departure Point:	FLUSHING, NY (LGA)	**Type of Flight Plan Filed:**	IFR
Destination:	(HYA)	**Type of Clearance:**	IFR
Departure Time:	1720 EST	**Type of Airspace:**	Class D

Airport Information

Airport:	BARNSTABLE MUNICIPAL (HYA)	**Runway Surface Type:**	Asphalt
Airport Elevation:	55 ft	**Runway Surface Condition:**	Ice; Snow--wet
Runway Used:	24	**IFR Approach:**	ILS
Runway Length/Width:	5425 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 None	**Aircraft Fire:**	None
Ground Injuries:	2 Minor	**Aircraft Explosion:**	None
Total Injuries:	2 Minor, 4 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	STEPHEN M DEMKO	**Adopted Date:**	04/06/2001
Additional Participating Persons:	KEVIN CAHILL; BEDFORD, MA ALLEN LANE; CHICAGO, IL RICHARD BUNKER; BOSTON, MA		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		