

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

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**EXCERPTS FROM FAA ORDER 7110.65, AIR TRAFFIC CONTROL, FAA Order 7210.3, Facility
Operation and Administration and 14 CFR 91**

DCA10IA001

On October 21, 2009, Northwest Airlines (NWA) flight 188, an Airbus A320, N374NW, did not respond to air traffic control communications for approximately one hour 17 minutes during cruise at FL370. Flight 188 flew past their intended destination while the flight was NORDO (no radio communications) but landed without further incident once radio communication was reestablished. There were no injuries to the 2 pilots, 3 flight attendants and 144 passengers onboard. The flight was a regularly scheduled passenger flight operating under 14 Code of Federal Air Regulation Part 121 from San Diego International Airport (SAN), San Diego, California, to Minneapolis-St Paul International/Wold-Chamberlain Airport (MSP), Minneapolis, Minnesota.

Excerpts from FAA Order 7110.65, Air Traffic Control

Pilot – Controller Glossary - HANDOFF

An action taken to transfer the radar identification of an aircraft from one controller to another if the aircraft will enter the receiving controller's airspace and radio communications with the aircraft will be transferred.

Pilot-Controller Glossary - LOST COMMUNICATIONS

Loss of the ability to communicate by radio. Aircraft are sometimes referred to as NORDO (No Radio). Standard pilot procedures are specified in 14 CFR Part 91. Radar controllers issue procedures for pilots to follow in the event of lost communications during a radar approach when weather reports indicate that an aircraft will likely encounter IFR weather conditions during the approach.

Paragraph 2-1-17. RADIO COMMUNICATIONS TRANSFER

a. Transfer radio communications before an aircraft enters the receiving controller's area of jurisdiction unless otherwise coordinated or specified by a letter of agreement or a facility directive.

b. Transfer radio communications by specifying the following:

NOTE-

Radio communications transfer procedures may be specified by a letter of agreement or contained in the route description of an MTR as published in the DOD Planning AP/1B (AP/3).

1. The facility name or location name and terminal function to be contacted. **TERMINAL:** Omit the location name when transferring communications to another controller within your facility; except when instructing the aircraft to change frequency for final approach guidance include the name of the facility.

2. Frequency to use except the following may be omitted:

(a) FSS frequency.

(b) Departure frequency if previously given or published on a SID chart for the procedure issued.

(c) **TERMINAL:**

(1) Ground or local control frequency if in your opinion the pilot knows which frequency is in use.

(2) The numbers preceding the decimal point if the ground control frequency is in the 121 MHz bandwidth.

EXAMPLE

“Contact Tower.”

“Contact Ground.”

“Contact Ground Point Seven.”

“Contact Ground, One Two Zero Point Eight.”

“Contact Huntington Radio.”

“Contact Departure.”

“Contact Los Angeles Center, One Two Three Point Four.”

3. Time, fix, altitude, or specifically when to contact a facility. You may omit this when compliance is expected upon receipt.

NOTE

AIM, para 5-3-1, ARTCC Communications, informs pilots that they are expected to maintain a listening watch on the transferring controller's frequency until the time, fix, or altitude specified.

PHRASEOLOGY

CONTACT (facility name or location name and terminal function), (frequency).

If required,

AT (time, fix, or altitude).

c. In situations where an operational advantage will be gained, and following coordination with the receiving controller, you may instruct aircraft on the ground to monitor the receiving controller's frequency.

EXAMPLE

“Monitor Tower.”

“Monitor Ground.”

“Monitor Ground Point Seven.”

“Monitor Ground, One Two Zero Point Eight.”

d. In situations where a sector has multiple frequencies or when sectors are combined using multiple frequencies and the aircraft will remain under your jurisdiction, transfer radio communication by specifying the following:

PHRASEOLOGY

(Identification) CHANGE TO MY FREQUENCY (state frequency).

EXAMPLE

“United two twenty-two change to my frequency one two three point four.”

REFERENCE

AIM, Para 4-2-3, Contact Procedures.

e. Avoid issuing a frequency change to helicopters known to be single-piloted during air-taxiing, hovering, or low-level flight. Whenever possible, relay necessary control instructions until the pilot is able to change frequency.

NOTE-

Most light helicopters are flown by one pilot and require the constant use of both hands and feet to maintain control. Although Flight Control Friction Devices assist the pilot, changing frequency near the ground could result in inadvertent ground contact and consequent loss of control. Pilots are expected to advise ATC of their single-pilot status if unable to comply with a frequency change.

REFERENCE

AIM, Para 4-3-14, Communications.

f. In situations where the controller does not want the pilot to change frequency but the pilot is expecting or may want a frequency change, use the following phraseology.

PHRASEOLOGY

REMAIN THIS FREQUENCY.

REFERENCE

FAAO JO 7110.65, Para 4-7-1, Clearance Information.

FAAO JO 7110.65, Para 5-12-9, Communication Transfer.

Paragraph 2-1-25. SUPERVISORY NOTIFICATION.

Ensure supervisor/controller-in-charge (CIC) is aware of conditions which impact sector/position operations including, but not limited to, the following:

- a. Weather.
- b. Equipment status.
- c. Potential sector overload.
- d. Emergency situations.
- e. Special flights/operations.

Paragraph 2-4-3. PILOT ACKNOWLEDGMENT/READ BACK

a. When issuing clearances or instructions ensure acknowledgment by the pilot.

NOTE-

Pilots may acknowledge clearances, instructions, or other information by using “Wilco,” “Roger,” “Affirmative,” or other words or remarks.

REFERENCE

AIM, Para 4-2-3, Contact Procedures.

b. If altitude, heading, or other items are read back by the pilot, ensure the read back is correct. If incorrect or incomplete, make corrections as appropriate.

Paragraph 10-4-4. COMMUNICATIONS FAILURE

Take the following actions, as appropriate, if two-way radio communications are lost with an aircraft:

NOTE

1. When an IFR aircraft experiences two-way radio communications failure, air traffic control is based on anticipated pilot actions. Pilot procedures and recommended practices are set forth in the AIM, CFRs, and pertinent military regulations.

2. Should the pilot of an aircraft equipped with a coded radar beacon transponder experience a loss of two-way radio capability, the pilot can be expected to adjust the transponder to reply on Mode 3/A Code 7600.

a. In the event of lost communications with an aircraft under your control jurisdiction use all appropriate means available to reestablish communications with the aircraft. These may include, but not be limited to, emergency frequencies, NAVAIDs that are equipped with voice capability, FSS, Aeronautical Radio Incorporated (ARINC), etc.

NOTE

1. ARINC is a commercial communications corporation which designs, constructs, operates, leases or otherwise engages in radio activities serving the aviation community. ARINC has the capability of relaying information to/from subscribing aircraft throughout the country.

2. Aircraft communications addressing and reporting system (ACARS) or selective calling (SELCAL) may be utilized to reestablish radio communications with suitably equipped aircraft. ACARS can be accessed by contacting the San Francisco ARINC communications center, watch supervisor, at 925-294-8297 and 800-621-0140. Provide ARINC the aircraft call sign, approximate location, and contact instructions. In order to utilize the SELCAL system, the SELCAL code for the subject aircraft must be known. If the SELCAL code is not contained in the remarks section of the flight plan, contact the pertinent air carrier dispatch office to determine the code. Then contact the San Francisco ARINC communications center, watch supervisor, at 925-294-8297 and 800-621-0140. Provide ARINC the aircraft call sign, SELCAL code, approximate location, and contact instructions.

b. Broadcast clearances through any available means of communications including the voice feature of NAVAIDs.

NOTE

1. Some UHF equipped aircraft have VHF navigation equipment and can receive 121.5 MHz.

2. “Any available means” includes the use of FSS and ARINC.

REFERENCE

FAAO JO 7110.65, Para 4-2-2, Clearance Prefix.

c. Attempt to re-establish communication by having the aircraft use its transponder or make turns to acknowledge clearances and answer questions. Request any of the following in using the transponder:

1. Request the aircraft to reply Mode 3/A “IDENT.”

2. Request the aircraft to reply on Code 7600 or if already on Code 7600, the appropriate stratum code.

3. Request the aircraft to change to “stand-by” for sufficient time for you to be sure that the lack of a target is the result of the requested action.

PHRASEOLOGY

REPLY NOT RECEIVED, (appropriate instructions).

(Action) OBSERVED, (additional instructions/information if necessary).

d. Broadcast a clearance for the aircraft to proceed to its filed alternate airport at the MEA if the aircraft operator concurs.

REFERENCE

FAAO JO 7110.65, Para 5-2-8, Radio Failure.

FAAO JO 7110.65, Para 9-2-7, IFR Military Training Routes.

e. If radio communications have not been (re)established with the aircraft after five minutes, consider the aircraft's activity to be possibly suspicious and handle the flight per FAAO JO 7610.4, Chapter 7, Hijacked/Suspicious Aircraft Reporting and Procedures.

Excerpts from FAA Order 7210.3, Facility Operation and Administration

Paragraph 3-3-3. MONITORING FREQUENCIES

a. Frequencies allocated to a facility shall be continuously monitored except:

1. ARTCCs need not monitor 121.5 and 243.0 MHz if other ATC facilities monitor those frequencies in a given area.

2. AFSSs/FSSs equipped with ICSS equipment may reconfigure the ICSS to allow the temporary selection, muting, or rerouting of 121.5 and 243.0 MHz during the period of an interfering signal; e.g., continuous emergency locator transmitter (ELT), stuck mike, etc.

b. Facilities shall establish procedures to ensure that frequencies used on a shared basis; e.g., single frequency approach operations, are continuously monitored by one of the positions of operation.

Paragraph 3-3-4. EMERGENCY FREQUENCIES 121.5 AND 243.0 MHz

a. Air traffic facilities shall have transmit and receive capability on emergency frequencies 121.5 and 243.0 MHz as necessary to meet emergency frequency network requirements.

b. Normally, ARTCC emergency frequency capability shall be limited to the transmitter/receiver site nearest the ARTCC.

c. At locations having more than one type of facility, such as an AFSS/FSS and a tower, or an AFSS/FSS, a tower, and an ARTCC, a common transmitter and receiver may be shared where practicable. Where this is done, the transmitter shall be equipped with a lockout device to avoid inadvertent interference between facilities.

d. When facilities are in proximity and no derogation of services will result, transmit/ receive capability should not be provided for each facility. The following requirements shall be maintained:

1. Geographical area coverage shall not be derogated.

2. DF-equipped facilities shall have transmit/receive capability on 121.5 MHz.

3. Facilities without emergency frequency capability shall have appropriate landlines for rapid relay of emergency information.

e. The two emergency channels shall not be terminated on the same key in the transmitter-receiver selector panels. Neither emergency frequency shall be terminated with any other frequency.

f. To preclude inadvertent use of these frequencies, a mechanical or other appropriate device shall be provided which will require deliberate removal or bypass before any emergency frequency transmit key can be moved to the locked-operate position.

g. UHF emergency frequency 243.0 MHz is installed in military aircraft using an override arrangement. As a result, transmissions on this frequency are received by all military aircraft within the transmitter's area of coverage. Unnecessary emissions on this frequency derogate communications on ATC frequencies and may interfere with valid emergency communications. Reduce transmissions on 243.0 MHz to the absolute minimum consistent with safety.

h. As a minimum, conduct two-way, ground-to-air checks during low activity periods:

1. Once a week.

2. Following equipment repairs.

Excerpts from Code of Federal Regulations (CFR) 14 Aeronautics and Space

14 CFR 91.123 – COMPLIANCE WITH ATC CLEARANCES AND INSTRUCTIONS.

(a) When an ATC clearance has been obtained, no pilot in command may deviate from that clearance unless an amended clearance is obtained, an emergency exists, or the deviation is in response to a traffic alert and collision avoidance system resolution advisory. However, except in Class A airspace, a pilot may cancel an IFR flight plan if the operation is being conducted in VFR weather

conditions. When a pilot is uncertain of an ATC clearance, that pilot shall immediately request clarification from ATC.

(b) Except in an emergency, no person may operate an aircraft contrary to an ATC instruction in an area in which air traffic control is exercised.

(c) Each pilot in command who, in an emergency, or in response to a traffic alert and collision avoidance system resolution advisory, deviates from an ATC clearance or instruction shall notify ATC of that deviation as soon as possible.

(d) Each pilot in command who (though not deviating from a rule of this subpart) is given priority by ATC in an emergency, shall submit a detailed report of that emergency within 48 hours to the manager of that ATC facility, if requested by ATC.

(e) Unless otherwise authorized by ATC, no person operating an aircraft may operate that aircraft according to any clearance or instruction that has been issued to the pilot of another aircraft for radar air traffic control purposes.

14 CFR 91.185 - IFR OPERATIONS: TWO-WAY RADIO COMMUNICATIONS FAILURE.

(a) General. Unless otherwise authorized by ATC, each pilot who has two-way radio communications failure when operating under IFR shall comply with the rules of this section.

(b) VFR conditions. If the failure occurs in VFR conditions, or if VFR conditions are encountered after the failure, each pilot shall continue the flight under VFR and land as soon as practicable.

(c) IFR conditions. If the failure occurs in IFR conditions, or if paragraph (b) of this section cannot be complied with, each pilot shall continue the flight according to the following:

(1) Route.

(i) By the route assigned in the last ATC clearance received;

(ii) If being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance;

(iii) In the absence of an assigned route, by the route that ATC has advised may be expected in a further clearance; or

(iv) In the absence of an assigned route or a route that ATC has advised may be expected in a further clearance, by the route filed in the flight plan.

(2) Altitude. At the highest of the following altitudes or flight levels for the route segment being flown:

(i) The altitude or flight level assigned in the last ATC clearance received;

(ii) The minimum altitude (converted, if appropriate, to minimum flight level as prescribed in § 91.121(c)) for IFR operations; or

(iii) The altitude or flight level ATC has advised may be expected in a further clearance.

(3) Leave clearance limit.

(i) When the clearance limit is a fix from which an approach begins, commence descent or descent and approach as close as possible to the expect-further-clearance time if one has been received, or if one has not been received, as close

as possible to the estimated time of arrival as calculated from the filed or amended (with ATC) estimated time enroute.

(ii) If the clearance limit is not a fix from which an approach begins, leave the clearance limit at the expect-further-clearance time if one has been received, or if none has been received, upon arrival over the clearance limit, and proceed to a fix from which an approach begins and commence descent or descent and approach as close as possible to the estimated time of arrival as calculated from the filed or amended (with ATC) estimated time enroute.