National Aeronautics and
Space Administration

**Office of Inspector General**
Washington, DC 20546-0001

March 10, 2008

TO: Director, Glenn Research Center

FROM: Assistant Inspector General for Auditing

SUBJECT: Final Memorandum on Glenn Research Center's Land-based Mobile Communication System (Report No. IG-08-012; Assignment No. S-08-016-00)

During the Office of Inspector General (OIG) review of Glenn Research Center's emergency response system, we identified an issue that, because of its significance, warranted management's immediate attention. That issue concerned Glenn's land-based mobile communication system and the continued use of certain communication bandwidths in violation of National Telecommunications and Information Administration (NTIA) requirements. (See Enclosure 1 for details on the review's scope and methodology.)

## *Background*

NTIA Manual Part 4.3.9 1(a) and (b) required that, by December 31, 2007, Federal agencies transition from using wideband channels to using 12.5-kilohertz narrowband channels for land-based mobile communication systems.[1] This requirement implemented the "Land Mobile Spectrum Efficiency Plan," October 1993, which was mandated by the National Telecommunications Authorization Act of 1992, in an effort to reduce the probability of interference resulting from the "overcrowding" of certain bandwidths.

In a January 16, 2001, memorandum (see Enclosure 2), NASA provided the Frequency Assignment Subcommittee, Department of Commerce,[2] its plan for transitioning to the 12.5-kilohertz narrowband channels. The memorandum stated that NASA organizations would begin transitioning to the narrowband channels no later than October 1, 2004, and that the transition would be completed by December 31, 2007.

[1] Land-based mobile communication systems include handheld radios, vehicle-mounted radios, desk-based systems, base stations, repeaters, and other miscellaneous hardware.

[2] The Frequency Assignment Subcommittee falls under NTIA's Interdepartment Radio Advisory Committee; NTIA is a Department of Commerce bureau.

### *Glenn Not Compliant with NTIA Requirements*

Glenn did not meet the December 31, 2007, deadline for transitioning to the 12.5-kilohertz narrowband channels nor did it request a waiver in accordance with NTIA Manual Part 4.3.9 1(b). According to personnel from Glenn's land-based mobile communication user groups, the transition status as of January 14, 2008, was as follows:

- Facility Operations—waiting on installation of its new radio base stations, expect delivery of new radios by January 18, 2008.
- Logistics—transition complete.
- Safety—waiting on installation of its new radio base station, received partial delivery of new radios on January 2, 2008.
- Security—transition complete.[3]
- Test Facilities—transition effort underway, completion date unknown.

Because the transition was not completed by December 31, 2007, Glenn continued to use the wideband channels in support of mission operations and other activities, such as emergency response.[4] We understand the need to use the wideband channels to maintain operations and ensure facility safety and security; however, until such time that Glenn completes its transition to the 12.5-kilohertz narrowband channels, or is granted a waiver, Glenn (and NASA) will remain in violation of the NTIA requirement.

### *Recommendations, Management's Response, and Evaluation of Management's Response*

Management provided comments on our recommendations (see Enclosure 3) in response to our January 16, 2008, memorandum notifying the Glenn Director of this issue.

**Recommendation 1.** We recommended that the Director, Glenn Research Center, instruct the Glenn Radio Frequency Spectrum Manager to initiate a waiver through NTIA's Interdepartment Radio Advisory Committee, Frequency Assignment Subcommittee for continued use of wideband channels for land-based mobile communications.

**Management's Response.** The Director nonconcurred, stating that Glenn did not intend to pursue a waiver. He stated that the Glenn Radio Frequency Spectrum

[3] We were notified that compatibility problems might exist between the Safety and Security radios, which could potentially impact the emergency response system. We will address the compatibility problems as part of our overall review of Glenn's emergency response system.

[4] Although Logistics and Security have completed their transition efforts, they must continue to use the wideband channels to communicate with the user groups who have not.

Manager had communicated with NTIA officials regarding Glenn's need for a waiver or extension and that the NTIA officials stated that they would not accept waivers of the wideband requirement. The NTIA officials also stated that because of a United States/Canadian treaty concerning the wideband channel used by Glenn, any waiver would have to be coordinated with Canada and that they were unwilling to do so.

**Evaluation of Management's Response.** Although our intent was that a formal written request for a waiver be submitted in accordance with NTIA Manual Part 4.3.9 1(b), we accept the Director's response that a verbal waiver request was denied by the NTIA. Therefore, the recommendation is resolved and closed.

**Recommendation 2.** We recommended that the Director, Glenn Research Center, appoint an individual or committee to oversee the transition from the wideband channels to the 12.5-kilohertz narrowband channels to ensure that the transition is adequately coordinated between the Glenn Radio Frequency Spectrum Manager and the land-based mobile communication user groups and is completed in a timely manner.

**Management's Response.** The Director concurred, stating that the Glenn radio project manager would oversee the transition. He added that the transition should be completed no later than March 1, 2008.

**Evaluation of Management's Response.** Management's comments are responsive. We verified that on February 14, 2008, Glenn deactivated the wideband communication system and began using the 12.5-kilohertz narrowband channels for all of its land-based mobile communications. In addition, the Director provided comments on February 25 confirming the deactivation (see Enclosure 4). The recommendation is resolved and closed.

We appreciate the courtesies extended during our review. If you have any questions, or need additional information, please contact Ms. Carol Gorman, Space Operations and Exploration Director, at 202-358-2562.

signed

Evelyn R. Klemstine

4 Enclosures

cc:
Associate Administrator, Institutions and Management
Chief Information Officer
Chief, Safety and Mission Assurance
General Counsel

## Scope and Methodology

We collected, reviewed, and analyzed guidance and documents relating to land-based mobile communication systems. Specifically, we evaluated NTIA requirements, the National Telecommunications Authorization Act of 1992, and the Land Mobile Spectrum Efficiency Plan, October 1993. We also reviewed NASA's plans for transitioning to the use of 12.5 kHz narrowband communications channels and NASA's radio frequency authorizations. We interviewed Glenn officials including, the Glenn Radio Frequency Spectrum Manager, the lead Communications Engineer, and personnel from each of Glenn's land-based mobile communication user groups to obtain an overview of the Glenn communications system and to determine the status of each of the user groups in transitioning to use of the 12.5 kHz narrowband channels.

We performed this review from January through March 2008. We did not use computer-processed data to perform this review.

**Prior Coverage.** During the last 5 years, the Government Accountability Office (GAO) issued one report of particular relevance to the subject of this memorandum: "Better Knowledge Needed to Take Advantage of Technologies that May Improve Spectrum Efficiency" (GAO-04-666; May 2004). Unrestricted reports can be accessed over the Internet at http://www.gao.gov (GAO).

# NASA Memorandum to Frequency Assignment Subcommittee, Department of Commerce

National Aeronautics and
Space Administration

**Glenn Research Center**
21000 Brookpark Road
Cleveland OH 44135-3191

FAS 416/1

Reply to Attn of 6140

Mr. Gordon A. Crandall, III
Chairman,
Frequency Assignment Subcommittee
Department of Commerce
Room 1088, Herbert C. Hoover Building
14th and Constitution Avenue, NW
Washington, DC 20230

16 January 2001

Dear Mr. Crandall:

The National Aeronautics and Space Administration (NASA) is pleased to provide its' initial transition plan for land mobile assignment migration within the Government UHF land mobile band (M406.1-M420.0) to the new 12.5 kHz narrowband channel allocations. NASA understands that non-terrestrial assignments (planetary and orbital operations) in this band are exempt from this transition requirement.

In accordance with the NTIA Manual Part 4.3.9 [1(a) and 1(b)], NASA plans to execute the requested transition plan in phases as narrowband channels become available but no later than 31 December 2007 as follows:

- Since mid CY 2000 and during the on-going five year review process, NASA includes text in the SUP DETAILS of those "wideband" assignments in the subject band as follows:
  - "PER NTIA MANUAL PART 4.3.9 THIS ASSIGNMENT WILL BE REQUIRED TO USE 12.5 KHZ CHANNEL WITH AN 11.5 KHZ OR LESS EMISSION BANDWIDTH AFTER 31 DECEMBER 2007." This intent here is to provide an avenue to the NASA user that there exists a future NTIA requirement that must be accomplished at NASA expense and effort.

- Identify existing GMF assignments with emission bandwidths greater than 13 kHz (There are, at present, 205 NASA assignments meeting this criteria as listed in the 2 Dec 2000 version of the GMF CD-ROM).
  - Accordingly, provide each NASA Center Spectrum Manager with a listing of those assignments requiring transition; and,
  - request that the NASA Center Spectrum Manager initiate local transition plans and have them provide a letter to my office delineating that local plan by 1 October 2001.

When the aforementioned items have been accomplished, NASA will initiate the final phase of the transition plan. This phase should commence no later than 1 October 2004 to relocate - as possible - the existing GMF assignments that have emission bandwidths less than 12 kHz that are not on NASA allocated narrowband channels. This will be accomplished in accordance with any prior inter-Agency agreements or with the accepted frequency selection hierarchy.

Periodic updates will be provided during and after FY 02 to the Frequency Assignment Subcommittee as the date for transition approaches.

The NASA allocated narrowband channels are provided as information. NASA will migrate to these channels in accordance with the aforementioned statements.

NASA Allocated
Narrow Band UHF Channels

| | |
|---|---|
| 406.2375 | 415.2375 |
| 406.4375 | 415.4375 |
| 406.8375 | 415.8375 |
| 407.0375 | 416.0375 |
| 407.2375 | 416.2375 |
| 407.4375 | 416.4375 |
| 407.6375 | 416.6375 |

414.1375 (Simplex)

The enclosure lists those channels with emission bandwidths greater than or equal to 13 kHz that are the subject of the early phase of NASA's transition plan. Questions should be addressed to my office at the Glenn Research Center Cleveland OH on (216) 433 5545.

Sincerely,

Henry G. Schuett, Jr.
NASA Representative to the
Frequency Assignment Subcommittee

Enclosure

# Management's Comments

National Aeronautics and
Space Administration
**John H. Glenn Research Center**
**Lewis Field**
Cleveland, OH 44135-3191

January 31, 2008

Reply to Attn of: Security Management and Safeguards Office

TO: NASA Headquarters
Attn: Assistant Inspector General for Auditing

FROM: Director

SUBJECT: Glenn Research Center's Response to the NASA Office of Inspector General (OIG) Management Memorandum, "Glenn Research Center's Land-based Mobile Communication System," (Assignment No. S06-011-01)

Enclosed is the NASA Glenn Research Center's (GRC) formal response to the audit findings and recommendations in the subject OIG management memorandum concerning the Center's transition from existing wideband Trunked Land-based Mobile Communication System to a new system using narrowband operations.

The NASA OIG memorandum recommended that the Director, Glenn Research Center take the following actions:

1. Instruct the Glenn Radio Frequency Spectrum Manager to initiate a waiver through National Telecommunication and Information Administration's Interdepartment Radio Advisory Committee, Frequency Assignment Subcommittee that will grant GRC the authority to continue using the wideband channels until the transition is complete.

2. Appoint an individual or committee to oversee the transition effort to ensure that (a) the effort is adequately coordinated between the Glenn Radio Frequency Spectrum Manager and the land-based mobile communication user groups and (b) the effort is completed in a timely manner.

I have responded to each recommendation in the enclosure in terms of concurrence and completion date.

If you have any questions concerning this response, please contact Mr. Michael Bilinovich, Chief, Security Management and Safeguards Office, at (216) 433-2145.

Woodrow Whitlow, Jr.

Woodrow Whitlow, Jr.

Enclosure

**Response to NASA Office of Inspector General (OIG) Management Memorandum (Assignment S-06-011-01)**

**Recommendation 1**: Instruct the Glenn Radio Frequency Spectrum Manager to initiate a waiver through National Telecommunication and Information Administration (NTIA) Interdepartmental Radio Advisory Committee, Frequency Assignment Subcommittee, which will grant Glenn the authority to continue using the wideband channels until the transition is complete.

**Nonconcur:** During the course of GRC's efforts to transition its land-based mobile communication system to the required narrowband channels, the Glenn Radio Frequency Spectrum Manager has communicated with NTIA officials regarding the Center transition efforts and the need for a waiver or extension. NTIA officials have stated that the NTIA would not authorize any waiver or extension.

In August 2007, the Glenn Radio Frequency Spectrum Manager discussed procedures for Canadian coordination of proposals with NTIA officials and expressed concern that the GRC proposals might not be approved in time to meet the deadline of transitioning the land-based mobile communications system to narrow-band operations. At that time, he asked about procedures either for an extension of time for the requirements or a waiver. The Chief of the Frequency Assignment Area of NTIA and one of the NTIA action officers stated the following:

> The NTIA was not accepting waivers of the wideband requirement. In addition, since GRC is in a Canadian Border Coordination Zone, the issue is complicated by the fact that the United States has a negotiated and signed treaty with Canada for that frequency band. Consequently, any waiver request from GRC would have to be coordinated with Canada, and the NTIA is unwilling to do that. If the NTIA started asking for waivers, then Canada would do the same thing to the United States, which would defeat the purpose of the treaty. While the officials stated that they under-stood the GRC situation, there was nothing that the NTIA could do to help. The officials suggested that GRC explore the use of other All Government Agency (AGA) frequencies and try to make arrangements with other government agencies to use their frequencies.

Thus, GRC does not intend to pursue a waiver and requests that the OIG close recommendation 1.

**Recommendation 2**: Appoint an individual or committee to oversee the transition effort to ensure that (a) the effort is adequately coordinated between the Glenn Radio Frequency Spectrum Manager and the land-based mobile communication user groups and (b) the effort is completed in a timely manner.

**Concur:** The Physical Security Specialist in the Security Management and Safeguards Office is the radio project manager responsible for coordinating with the user groups and ensuring that the transition is completed in a timely manner. In addition, GRC formed a stakeholders committee consisting of representatives from Security, Safety, Facilities Operations, Logistics, Research, and Test Facilities, and the Radio Frequency Spectrum

Enclosure

Manager. Meetings to discuss stakeholder's requirements, issues, and concerns have been ongoing and will continue until full implementation to the new narrowband system.

**Completion Date:** The Glenn Research Center has completed the corrective actions for recommendation 2 and requests that the OIG close this recommendation. Transition of the Center's land-based mobile communication system to the required narrowband channels will be completed no later than March 1, 2008.

# Additional Management Comments

National Aeronautics and
Space Administration
**John H. Glenn Research Center**
**Lewis Field**
Cleveland, OH 44135-3191

February 25, 2008

Reply to Attn of: Security Management and Safeguards Office

TO: NASA Headquarters
Attn: Assistant Inspector General for Auditing

FROM: Director

SUBJECT: Glenn Research Center's update to the January 31, 2008, response to the NASA Office of Inspector General (OIG) Management Memorandum, "Glenn Research Center's Land-based Mobile Communication System," (Assignment No. S06-011-01)

This memorandum is an update to the NASA Glenn Research Center's (GRC) memorandum, dated January 31, 2008, which provided a formal response to the OIG audit findings and recommendations concerning the legacy wideband radio system at GRC.

This is to inform you that on February 14, 2008, the legacy wideband radio system at GRC was deactivated and transition to the new narrowband radio system was completed. With deactivation of the wideband radio system, GRC is now in full compliance with both the ultra high frequency (UHF) narrowband mandate and the UHF channel plan rebanding mandate of the National Telecommunications and Information Administration of the United States Department of Commerce.

Since GRC has completed all corrective actions for the two OIG recommendations concerning this matter, GRC considers this action closed.

Woodrow Whitlow, Jr.