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AUDIT REPORT

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NASA'S ASTRONAUT CORPS: STATUS OF
CORRECTIVE ACTIONS RELATED TO
HEALTH CARE ACTIVITIES

OFFICE OF INSPECTOR GENERAL



National Aeronautics and
Space Administration

Final report released by:

A handwritten signature in black ink, appearing to read 'PKMJA', written in a cursive style.

Paul K. Martin
Inspector General

Acronyms

BHP	Behavioral Health and Performance
GSA	General Services Administration
ISS	International Space Station
NODIS	NASA Online Directives Information System
NPR	NASA Procedural Requirements

OVERVIEW

NASA'S ASTRONAUT CORPS: STATUS OF CORRECTIVE ACTIONS RELATED TO HEALTH CARE ACTIVITIES

The Issue

NASA has established rigorous medical standards for the selection of new astronauts, space mission assignments, and medical and behavioral health to ensure that astronauts can adequately carry out missions in space. As of April 2010, NASA had 83 astronauts eligible to be assigned to a space mission and 9 astronaut candidates in training to become eligible for a mission. Prior to going into space, astronauts receive an average 6 years of training for a Space Shuttle mission and an average 8 years of training for an International Space Station (ISS) mission. The Astronaut Corps is supported by 21 medical and aerospace physicians, 2 psychiatrists, and 3 psychologists who provide routine health care, annual physical and behavioral health examinations, and support during training exercises and space flight missions.

The arrest of a NASA astronaut in February 2007 for personal actions that were the subject of criminal charges led to a number of internal and external reviews related to health care services provided to members of the Astronaut Corps. The first review, performed by Johnson Space Center (Johnson review) between February and June 2007, focused on Johnson's practice of behavioral medicine and included recommendations to improve Johnson's behavioral health care services for NASA astronauts.

A committee of Federal behavioral health care and aerospace medicine specialists commissioned by the NASA Administrator performed the second review, which focused on Johnson's overall astronaut health care program. That committee issued a report in July 2007 (Committee review) with recommendations to improve medical and behavioral health care provided to astronauts and their dependents, communication and coordination between NASA's medical providers and the behavioral health providers, and Astronaut Office operations.

A third review by NASA's Office of Safety and Mission Assurance (Safety and Mission Assurance review) in July 2007 focused on allegations of alcohol misuse by astronauts. The Office of Safety and Mission Assurance issued a report in August 2007 concluding that allegations of alcohol impairment or misuse by NASA astronauts were not substantiated; however, the report contained recommendations pertaining to alcohol policies within the Astronaut Corps and at the Centers as well as suggested revisions to the disciplinary policy for the ISS code of conduct.

We conducted this audit to assess NASA's actions to implement the recommendations contained in these three reviews to improve the medical and behavioral health care provided to the Astronaut Corps. We assessed whether NASA Headquarters and Johnson had taken corrective actions that (1) met the intent of the recommendations in the reviews and (2) whether the actions were implemented. We did not, however, test the effectiveness of NASA's implementation efforts nor did we validate the reviewers' findings. See Appendix A for details of the audit's scope and methodology.

Results

We determined that NASA had taken steps to implement 36 of the 39 recommendations contained in the three reviews. We also found that NASA had not completed or taken action on 2 recommendations because no NASA official had been assigned responsibility to address one of the issues and because the program addressed in the other recommendation had been suspended. Finally, NASA was unable to take action on 1 recommendation because the recommendation requires determining whether changes to the astronaut selection process were useful, which cannot be done yet.

NASA Took Actions to Address 36 Recommendations. We determined that all 3 of the recommendations from the Johnson review were addressed, all but 2 of the 30 recommendations from the Committee review were addressed, and 5 of the 6 recommendations from the Safety and Mission Assurance review were addressed.

The three recommendations in the Johnson review sought to improve the behavioral health care provided to astronauts and astronaut candidates. We found that NASA officials took actions that met the intent of the three recommendations. Specifically, the Johnson Space Medicine Division Chief issued new guidance (SD-09-021, "Annual Astronaut Behavioral Health Exam," March 23, 2009) to address the recommendation that a 30-minute behavioral health assessment be conducted in conjunction with annual medical flight physicals and the recommendation that behavioral medicine flight assessments be performed on Shuttle crewmembers. The guidance includes a requirement for the behavioral health providers to institute annual behavioral wellness evaluations for all astronauts regardless of flying status and a requirement for a psychiatrist to determine whether the astronaut is qualified for active flying status. In addition, NASA organized a working group that made recommendations to improve the astronaut selection process to address a recommendation that NASA enhance the assessment of an astronaut's fitness for flying duty.

Further, we determined that NASA took actions to meet the intent of 28 of the 30 recommendations issued by the Committee commissioned by the NASA Administrator. Specifically, NASA established or revised 21 policies and procedures to address 14 Committee recommendations related to Privacy Act information, alcohol misuse, behavioral health care, independent reviews of the behavioral health clinic, medical records, credentials, standard operating procedures for the behavioral health clinic, attendance and structure of the Aerospace Medicine Board, an Astronaut Code of

Professional Responsibility, and astronaut performance evaluations. NASA took additional actions to address 8 other Committee recommendations related to the psychological evaluation of applicants to the Astronaut Corps, medical testing of the Astronaut Corps, reporting safety concerns, continuity of health care, privacy of medical information, supervisory training, and surveying the Astronaut Corps regarding issues identified by the Committee. These actions included increasing behavioral health providers' involvement during the astronaut hiring process, providing training on topics such as privacy of medical records and supervision, hiring additional behavioral health providers, improving the explanation for medical testing, encouraging the reporting of safety concerns, and surveying the Astronaut Corps and flight surgeons about their knowledge of policies and procedures, the relationship between astronauts and flight surgeons, and allegations regarding astronauts misusing alcohol.

In addition, NASA provided us evidence of existing policies that satisfied the intent of an additional six recommendations. For example, NASA already had policies and procedures in place that addressed the Committee's recommendations regarding selection of crewmembers and the need to identify and share human factor concerns among all organizations involved in astronaut activities.

Finally, we found that NASA officials at Johnson and Kennedy Space Centers met the intent of five of the six recommendations made in the Safety and Mission Assurance report. The recommendations related to procedures on launch day, alcohol use by crewmembers, and conduct of crewmembers on the ISS. Specifically, Johnson revised an internal policy to include the risk of drinking to excess, finalized an internal policy on alcohol use in astronaut crew quarters, and provided NASA's disciplinary policy to the Multilateral Crew Operations Panel, an international body that makes policy decisions about the ISS. In addition, Johnson uses a flight surgeon's checklist, which includes a visual assessment of the astronauts up to 9 hours before launch, and an April 2008 policy that states that the mission-assigned flight surgeon, astronaut supervisor, and other managers are required to stay in Kennedy's astronaut crew quarters prior to launch. These actions satisfied the intent of the report's recommendation related to procedures on launch day. Finally, in response to the report, Kennedy officials issued a new policy on alcohol consumption in astronaut crew quarters.

NASA Had Not Taken Actions to Address Two Recommendations. At the time of this review, NASA Headquarters had not addressed the recommendation from the Safety and Mission Assurance report to implement a NASA-wide alcohol testing program because no NASA official had been assigned responsibility to address the issue.

In addition, NASA Headquarters had not addressed whether astronauts should be included in NASA's Personnel Reliability Program, as recommended in the Committee report. The Committee found that NASA civil service and military astronauts were not required to report illnesses, injuries, or medication use so that the responsible NASA entity could determine whether the astronauts were fit to perform their assigned duties. Even though the NASA Office of Protective Services suspended NASA's Personnel Reliability Program on June 10, 2009, we determined that including astronauts within

NASA's Personnel Reliability Program would not address the Committee's finding that astronauts were not required to report illnesses and non-NASA care. Therefore, to address the Committee's finding, NASA should require astronauts to certify that they will report all health care, to include mental health care, they receive from providers not affiliated with NASA when assigned to a mission and continuously report such non-NASA care until the mission is completed.

NASA Was Unable to Address One Recommendation. NASA was unable to address a Committee recommendation that it fully integrate behavioral health information derived from psychological testing evaluations into the final selection process of astronaut candidates if the information is found to be useful. Although NASA hired nine astronaut candidates in May 2009 using psychological testing evaluations in their selection, NASA officials said they cannot yet determine whether the behavioral health information they used was helpful, because the candidates have not yet successfully completed the training and evaluation period prior to becoming an astronaut. Additionally, it can take up to 8 years from the time NASA hires an astronaut candidate to when the astronaut returns from his or her first long-duration mission. Therefore, to determine whether the behavioral health information collected during the hiring process was useful, NASA officials said they will need to observe the performance of the new astronauts for a period significantly longer than the year that has elapsed since their hiring.

Management Action

The Assistant Administrator for Human Capital Management should issue policy establishing a NASA-wide program to test NASA astronauts and other employees for alcohol. We also recommended that Johnson's Space Medicine Division Chief issue a policy requiring newly assigned mission crewmembers to update any medical and behavioral health conditions and treatments received from non-NASA sources since their last annual NASA examination.

In response to a draft of this report, the Assistant Administrator for Human Capital Management nonconcurred with our recommendation to issue an Agency-wide alcohol policy. The Assistant Administrator said that given the press of other priorities, the Administrator and Deputy Administrator have not yet been briefed on the legal issues and complexities involved with establishing an alcohol-testing requirement for NASA civil service employees. However, the Assistant Administrator also said that NASA will "work toward staffing a final Agency decision on alcohol testing of civil service employees."

In light of the Assistant Administrator's pledge to reach a final Agency decision regarding testing NASA employees for alcohol, we are resolving the recommendation. We will close the recommendation when management issues a final decision on the matter.

The Assistant Administrator concurred with the intent of our recommendation to issue policy requiring astronauts to report all medical care received from non-NASA sources. However, rather than issue policy, the Space Medicine Division and Astronaut Office added a requirement to the annual family history form requiring astronauts to acknowledge that they must report to the Flight Medicine Clinic or Behavioral Health Clinic all instances of non-NASA health care that they receive.

We obtained and reviewed the revised annual family history form and have determined that this action is responsive to our recommendation. Accordingly, the recommendation is closed.

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INTRODUCTION

Background

Johnson Space Center is the lead Center for two NASA space missions – the Space Shuttle and International Space Station (ISS). Johnson’s Flight Crew Operations Directorate is responsible for providing trained astronauts for human space flight missions and experienced crewmembers to help resolve developmental and operational issues within the human space flight programs. The Astronaut Office, within the Flight Crew Operations Directorate, is responsible for selecting and training astronaut candidates¹ and civil service and military astronauts detailed from the Department of Defense.

The Astronaut Office is supported by Johnson’s Space Life Sciences Directorate’s Human Adaptation and Countermeasures Division and its Space Medicine Division. The Human Adaptation and Countermeasures Division conducts biomedical research to (1) understand human responses to space flight and (2) develop and test countermeasures to problematic issues that may affect crew health, safety, or performance during or after space flight missions. The Space Medicine Division provides medical and behavioral health services to the Astronaut Corps, such as routine medical care and physicals, behavioral health assessments, and support during missions and training exercises. The Space Medicine Division’s Clinical Services Branch is responsible for six clinics: a behavioral health clinic off-site near Johnson; a flight medicine clinic at Johnson providing health care to astronauts and their dependents; a clinic for Johnson employees; two medical clinics in Russia, which provide health care to NASA astronauts when training in Russia; and a medical clinic at NASA’s White Sands Test Facility in New Mexico.

Astronauts and their dependents receive health care services from 21 flight surgeons,² 2 psychiatrists, and 3 psychologists (referred to in this report as providers). The Space Medicine Division receives medical oversight, including reviews of the services provided by the Space Medicine Division to the Astronaut Corps, from the NASA Chief Health and Medical Officer. The Chief Health and Medical Officer is also responsible for developing NASA medical policies and chairing the Medical Policy Board. The Medical Policy Board is a Headquarters board composed of NASA and Federal physicians with aerospace medicine expertise that is responsible for health care policy, medical policy, and oversight of medical activities related to space flight.

¹ Recent hires who need to successfully complete the training and evaluation period prior to becoming an astronaut.

² A physician trained in aerospace (space aeronautics) medicine. Flight surgeons maintain the health of crewmembers, evaluate the impact of illness or injury on the ability of crewmembers to safely perform their duties, and develop countermeasures to the physiological effects of aviation and space flight.

On February 5, 2007, Lisa Nowak, an astronaut detailed from the military, was arrested in Orlando, Florida, for personal actions that were subject to felony criminal charges. According to the police report, Ms. Nowak was charged with attempted kidnapping, attempted vehicle burglary with battery, destruction of evidence, and battery. As a result of the incident, the Johnson Director began an internal assessment of the Center's behavioral medicine practices to determine whether Johnson personnel observed any behavior that might have indicated a situation existed prior to the incident and whether improvements could be made to the behavioral medicine program. Johnson concluded in a June 2007 report, "Johnson's Internal Assessment of Medical Practices after Nowak Incident," that there were no indications that something could have predicted the events that occurred or that anything could have been done to change them. However, the Johnson Director made three recommendations to improve the Center's behavioral health assessment process for astronauts.

On February 7, 2007, the NASA Administrator directed the Agency's Chief Health and Medical Officer to coordinate a review of the Space Medicine Division's medical and behavioral health services provided to NASA astronauts. The Chief Health and Medical Officer assembled seven physicians and one attorney with military or Federal employment experience in medical, behavioral health, and aerospace (space aeronautics) medicine expertise to form the Astronaut Health Care System Review Committee. The Committee interviewed the Chief Health and Medical Officer and various Johnson personnel, including Space Medicine Division management, flight surgeons, behavioral health providers, astronauts, and astronauts' family members. The Committee also reviewed Headquarters and Johnson medical and behavioral health policies and related documentation. On July 16, 2007, the Committee issued "NASA Astronaut Health Care System Review Committee February–June 2007 Report to the Administrator," which included findings and 29 recommendations related to medical and behavioral health care provided to astronauts and their dependents, employee perceptions, and Astronaut Office operations. During congressional testimony, the Committee Chair added one verbal recommendation – to survey NASA astronauts and flight surgeons – making a total of 30 Committee recommendations.

On July 26, 2007, the NASA Deputy Administrator directed the Chief of Safety and Mission Assurance to review allegations of astronauts' misuse of alcohol raised in the Committee's report. The Office of Safety and Mission Assurance interviewed flight surgeons, astronauts, and managers; reviewed Federal, NASA, and Johnson requirements; and analyzed safety reporting records. The resulting report, "Space Flight Safety Review (Alcohol Use in the Preflight Period)," August 28, 2007, stated: "There was no evidence of alcohol impairment by flight crew astronauts that occurred during the launch period or of alcohol misuse that was brought to management's attention or disregarded by management." However, the report included six recommendations related to NASA policies and procedures.

On September 6, 2007, the NASA Administrator, the Chief Health and Medical Officer, the Chief of Safety and Mission Assurance, and the Flight Crew Operations Directorate

Director testified before the House Subcommittee on Space and Aeronautics regarding the Committee's report and NASA's medical and behavioral health care programs for NASA astronauts. The Administrator stated that the Committee's recommendations would improve the medical and behavioral health care provided to the Astronaut Corps. In February, June, and October of 2008, NASA provided Congress with written documentation on its planned or completed actions to address the 30 Committee recommendations. In addition, Johnson reported to the Medical Policy Board from December 2007 through March 2009 on the status of its actions to address the Committee's medical recommendations.

Objectives

We assessed whether NASA Headquarters and Johnson had taken corrective actions that (1) met the intent of the recommendations in the three reviews related to the Astronaut Corps and (2) whether the actions were implemented. In this review, we did not test the effectiveness of NASA's implementation efforts, nor did we validate the reviewers' underlying findings that led to the recommendations in the first place. See Appendix A for details of the audit's scope and methodology.

NASA TOOK ACTIONS TO ADDRESS 36 OF 39 RECOMMENDATIONS

NASA took actions that met the intent of 36 of the 39 recommendations from the three separate reviews conducted as a result of the Nowak incident. Specifically, NASA officials stated that they implemented changes to address all 3 recommendations from the Johnson review, 28 out of 30 recommendations from the Committee review, and 5 out of 6 recommendations from the Safety and Mission Assurance review.

Three Johnson Recommendations Addressed

The June 2007 report, “Johnson’s Internal Assessment of Medical Practices after Nowak Incident,” included three recommendations to improve the Center’s behavioral health assessment process for astronauts. Specifically, the three recommendations made by the Johnson Director related to improving the behavioral health care provided to astronauts and astronaut candidates. We determined that actions taken by Johnson’s Space Medicine Division in response to recommendations 1ci and 3ci made in the Committee report satisfied the intent of the Johnson report’s recommendations.

Johnson Recommendation 1. The Johnson Director recommended a 30-minute behavioral medicine assessment be conducted in conjunction with annual medical flight physicals.

Johnson Recommendation 2. The Johnson Director recommended that behavioral medicine flight assessments be performed on Shuttle crewmembers.

Audit Evaluation. Actions taken in response to Committee Recommendation 3ci (see page 14) met the intent of Johnson Recommendations 1 and 2. Although we did not review medical records to ensure that they included a psychiatrist’s determination of whether the astronaut was qualified for active flying status, we verified that the Space Medicine Division Chief issued guidance (SD-09-021, “Annual Astronaut Behavioral Health Exam,” March 23, 2009) to the behavioral health providers to institute annual behavioral wellness evaluations for all astronauts regardless of flying status. The guidance includes a requirement for a psychiatrist to determine whether the astronaut is qualified for active flying status.

Johnson Recommendation 3. The Johnson Director recommended that NASA enhance the aeronautical adaptability ratings for astronaut medical selections.

Audit Evaluation. Aeronautical adaptability is the assessment of an astronaut’s fitness for flying duty. The aeronautical adaptability rating covers motivational issues, such as

how a family feels about the astronaut flying, anger, anger management, and achievements in their lives. The Army, Navy, and Coast Guard all use the aeronautical adaptability rating for assessing fitness for flying duty.

Although the Space Medicine Division did not enhance the aeronautical adaptability ratings used for astronaut selections in response to this recommendation, the Johnson Deputy Director stated that the recommendation's intent had been satisfied by changes made to address Committee Recommendation 1ci (see below). We verified that those changes had been implemented; therefore, we agree with the Johnson Deputy Director that NASA took corrective actions to meet the intent of this recommendation.

Twenty-eight Committee Recommendations Addressed

The Committee's report, "NASA Astronaut Health Care System Review Committee February–June 2007 Report to the Administrator," contained 29 recommendations and during congressional testimony the Committee Chair added another recommendation. We determined that NASA took actions to satisfy 21 of the Committee's 30 recommendations and provided evidence of existing policies and procedures that satisfied the intent of 7 additional recommendations. These recommendations included behavioral health for astronauts and astronaut candidates; medical care for astronauts and their dependents; management, supervision, and training of astronauts; conduct of and alcohol use by astronauts; NASA's safety reporting system; and the operation of the medical and behavioral health clinics. To date, NASA had not addressed one of the Committee's remaining two recommendations (see page 30). Finally, NASA was unable to take action in response to the final recommendation for reasons explained on page 34.

Committee Recommendation 1ci. The Committee found that while psychological testing and evaluation is conducted during the hiring of astronauts and is intended to identify applicants who can adapt most readily and perform effectively in the extreme environment of space flight, this information is rarely and inconsistently used. Further, details on the use of psychological testing methods, criteria used for evaluation, and optimal performance data either do not exist or were not made available to the Committee for review. The Committee recommended that NASA charter an expert panel to determine what, if any, psychological testing should be performed and how it should be used to select astronaut candidates suitable for space operations.

Management Actions. To address this recommendation, the Space Medicine Division reviewed the current astronaut selection process. In addition, the Space Medicine Division formed an Astronaut Selection Working Group consisting of eight members selected from a list of credentialed psychologists and professionals with military operational, academic, or consultant experience. The Working Group made the following 10 recommendations.

1. Perform a job/work analysis to verify and modify the appropriateness of 10 astronaut attributes. Ensure coverage of the full spectrum of astronaut training and duties, to include ground and flight performance.
2. Develop a matrix of astronaut attributes by assessment techniques. The matrix should map assessment techniques, tools, and measures to astronaut attributes. Also, perform an evaluation of current assessment tools against the matrix to identify gaps, unnecessary redundancies, and irrelevance.
3. Perform a criterion-related validation to evaluate the evidence base for the evaluation tools currently in use. This process would evaluate the astronauts' scores from selection tools and tests and compare them to scores from training data.
4. Review best practices to ensure optimal effectiveness of the astronaut selection program.
5. Update the Astronaut Selection Board interview process to include an operational psychologist during the interview.
6. Update the Astronaut Selection Board final deliberation process to include an operational psychologist during the deliberation.
7. Analyze the presentation of available data to derive qualitative and quantitative combinations of information to present expected astronaut performance to the Astronaut Selection Board at critical points to assist in its decision making.
8. Upgrade the current astronaut selection interview process to include two behavioral specialists who complete ratings on each applicant, creating anchors for ratings within each dimension.
9. Establish ongoing behavioral science support to astronauts.
10. Change the initial applicant screening process to benefit from best practices within the behavioral health community.

Audit Evaluation. We verified that NASA chartered an expert panel and held a workshop at Johnson in May 2008 and that the Working Group made 10 recommendations. In order to assess whether Johnson implemented the Committee's recommendation, we reviewed details of methods, criteria, and optimal performance data used to identify applicants who can adapt most readily and perform effectively in the extreme environment of space flight. We also reviewed records identifying behavioral health specialists in the interview and the group's final deliberation process to determine that the Space Medicine Division had implemented Working Group Recommendations 2–3 and 5–10.

According to the Space Medicine Division Chief, Recommendation 1 was not implemented because a work analysis must be done when there is a significant mission change affecting the work performed by astronauts. Because there was not a significant mission change prior to hiring the May 2009 astronaut class, the Space Medicine Division Chief said the time was not right to implement this recommendation. In addition, the Space Medicine Division did not implement Recommendation 4 prior to selecting the May 2009 astronaut class because the staff considered the efforts of the Working Group as a best practices review and, therefore, did not require a separate best practice assessment. We agree with the reasoning for not implementing Recommendations 1 and 4. Therefore, we determined that NASA implemented corrective actions that met the intent of the Committee recommendation.

Committee Recommendation 1cii. The Committee recommended that the extensive behavioral health data already collected be analyzed to determine whether the data can be applied to future candidate selection and potentially guide astronaut selection for flight.

Management Actions. The Space Medicine Division behavioral health providers reviewed selection ratings on 53 astronauts from 1998, 2000, and 2003 and placed all selection scores into a database. In addition, they reviewed the need for analyses of different astronaut jobs and worked with Johnson's Astronaut Office, Space Shuttle Program and ISS Program training offices, and Johnson's Human Resources Office to determine whether other data was available for analysis. The Space Medicine Division also met with the Astronaut Office Chief and obtained verbal agreement for the behavioral health providers to spend more time with astronaut candidates to perform testing.

Audit Evaluation. We verified that the Space Medicine Division worked with the Astronaut Office to review the prior years' internal selection ratings and computed correlations on the performance ratings. In addition, we verified that the behavioral health data collected was used to determine whether such data could be applied to future candidate selection and potentially guide astronaut selection for missions. We also confirmed that NASA used this data in the selection of the May 2009 astronaut candidate class. Therefore, we concluded that NASA had implemented corrective actions that met the intent of the recommendation.

Committee Recommendation 1di. The Committee found the use of behavioral health selection and patient data to be a matter of concern for astronauts, family members, and medical health and behavioral health providers. The Committee recommended that NASA ensure that the use of all psychiatric and psychological data, both patient and research related, is explained to astronaut candidates, astronauts, and family members. In addition, appropriate privacy and human subject considerations should apply to use of the data.

Management Actions. To address the behavioral health clinic’s Privacy Act requirements, the Space Medicine Division issued five Behavioral Health and Performance (BHP) policies and procedures on July 31, 2008:

- “BHP Provider Rules and Regulations”
- BHP 3.00, “BHP Patient Access to Clinical Records”
- BHP 4.00, “BHP Patient Rights and Responsibilities”
- BHP 7.00, “BHP Privacy Act of 1974, as amended Operating Plan”
- BHP 8.00, “BHP Release of Privacy Act Information”

Additionally, the Space Medicine Division developed “Protection, Privacy, and Confidentiality of Medical Data,” a training course on providers’ Privacy Act responsibilities, and all Space Life Sciences Directorate personnel completed this course by December 2007. In February 2009, the course was also made available to all Johnson employees through the Center’s online training system. Finally, the Space Medicine Division developed a brochure on the behavioral health clinic and patient privacy rights. The brochure was made available at the clinic and sent to every astronaut in the spring of 2007.

For the protection of human subjects during NASA research, NASA and Johnson already had policies and procedures in place for researchers’ use of an astronaut’s medical and Privacy Act data, as required by Title 14, Code of Federal Regulations, Part 1230, “Protection of Human Subjects,” June 18, 1991. Specifically, NASA Policy Directive 7100.8E, “Protection of Human Research Subjects,” May 2002 (revalidated April 16, 2007), and NASA Procedural Requirements (NPR) 7100.1, “Protection of Human Research Subjects,” March 2003 (revalidated July 7, 2008), require an astronaut’s written consent prior to a researcher accessing medical data. The requirements state that an astronaut’s informed consent and an assurance of confidentiality must be on file in order to prevent the inappropriate release or use of any medical data. Applicable privacy and confidentiality requirements are found in Johnson Policy Directive 1382.5B, “Maintaining the Privacy of Biomedical Research Data,” January 27, 2004.

Audit Evaluation. We did not review day-to-day operations or medical records to ensure that NASA personnel followed the privacy requirements of the July 2008 BHP policies and procedures. However, we verified that the Space Medicine Division issued the five BHP policies related to the Privacy Act requirements, as well as providing astronauts with the behavioral health clinic brochure that discusses privacy rights information. We also verified that the Space Medicine Division created a training course on privacy, that Space Life Sciences Directorate personnel took the course, and that the course was available to Johnson employees through an online training system. In addition, we verified that Johnson had existing policies and procedures for use of

employee privacy data for research purposes. Therefore, we determined that NASA took corrective actions that met the intent of the recommendation.

Committee Recommendation 2ai. The Committee reported that several astronauts expressed concerns regarding the purpose of their medical testing. Therefore, the Committee recommended that NASA ensure that policies and procedures are in place and properly implemented to communicate the purpose of medical tests performed on astronauts prior to, during, and after flight. These policies should clearly indicate which tests are intended for medical or safety monitoring and which are for research purposes. The policies should also require an astronaut's informed consent for gathering data for research. The Committee reported that including astronauts in this process would result in more complete information to enhance cooperation between the medical and astronaut community.

Management Actions. The Space Life Sciences Directorate's Human Adaptation and Countermeasures Division Deputy Chief stated that all research involving astronauts is approved through the Committee for the Protection of Human Subjects. The Space Life Sciences Directorate's Work Instruction SA-WI-007, "Space and Life Science Flight Crew Informed Consent Briefings," September 24, 2003, states that the Directorate conducts briefings to provide information on planned human testing that allow potential subjects to make an informed decision on participation. The briefings establish a nonprofessional's level of understanding on the life science experiments, risks and benefits of obtaining medical and scientific data, and crewmember participation expectation. A consent form and a data-sharing release form are given to the crewmembers to review, sign, and return if they want to participate in the testing. However, crewmembers can elect not to participate in the testing if they later change their mind. The Space Life Sciences Directorate also provides the informed consent briefing package (including the agenda and presentations) before finalizing and presenting it to the Flight Crew Operations Directorate for review.

In addition to this existing process, the Space Life Sciences Directorate's Human Adaptation and Countermeasures Division Deputy Chief said the Directorate enhanced its procedures by implementing a color-coding system to further distinguish medical operational requirements from research.

Audit Evaluation. We verified that the Space Life Sciences Directorate already had procedures in place to communicate the purpose of medical tests performed prior to, during, and after flight, as well as to obtain agreement and consent forms from crewmembers prior to the tests. We reviewed the Work Instruction and verified that it also provides guidance for conducting the informed consent briefings, defines roles and responsibilities, and establishes the implementing authority for each briefing. We also verified that the Directorate uses a color-coded system to distinguish medical operational requirements from research. Therefore, we determined that NASA implemented corrective actions that met the intent of the recommendation.

Committee Recommendations 2bi. The Committee identified alleged cases of inappropriate alcohol use by astronauts in the immediate preflight period. The Committee

recommended that NASA ensure that specific policies, procedures, educational efforts, and disciplinary actions are in place to foster a culture that holds individuals and supervisors accountable for safe and responsible use of alcohol.

Management Actions. The Flight Crew Operations Directorate Assistant Director stated that Flight Crew Operations Directorate management could enforce NPR 3752.1, “Disciplinary and Adverse Actions,” May 7, 1999 (revalidated May 5, 2006), to address the improper use of alcohol by civil service astronauts and refer military astronauts to the respective military entity for disciplinary actions. The Flight Crew Operations Directorate Director stated that a flight surgeon has always been assigned to each mission and the mission-assigned flight surgeon and other NASA managers stay in the Johnson and Kennedy crew quarters during the prelaunch period. Additionally, the flight surgeon and NASA managers are with the crew from wake-up until launch on launch day. The Space Medicine Division Chief added that the mission-assigned flight surgeon performs a visual check of each astronaut prior to launch.

The Flight Crew Operations Directorate created CA-07-28, “Space Flight Alcohol Policy,” on July 27, 2007, and updated the policy under CA-08-20 on June 25, 2008. The policy applies to any person launching on a NASA spacecraft and states that alcohol is prohibited within 16 hours of space flight. Johnson Policy Directive 8710.1, “Alcohol Consumption in the Astronaut Crew Quarters,” October 3, 2007, and Kennedy NASA Policy Directive 1600.4, “Alcohol Consumption in the Astronaut Crew Quarters,” October 18, 2007, identify policies for limited and responsible alcohol consumption in the astronaut crew quarters at Johnson and Kennedy, respectively. The Astronaut Office Chief briefed NASA astronauts in January 2008 to ensure awareness of the new policies and management’s expectations on alcohol use and abuse. In addition, the policies were provided to all astronauts.

Audit Evaluation. We did not visit crew quarters to determine whether the policies were followed. However, we verified that the above-mentioned policies address the safe and responsible use of alcohol within Johnson and Kennedy crew quarters and that the disciplinary policy is applicable to all civil service, military, contractor, or international partner personnel and their guests, to include astronauts. We also verified that the policies are available from the Astronaut Office or on Johnson’s Web site. Finally, we verified that the Space Medicine Division has a flight surgeon checklist that states a visual assessment of the astronauts should occur between 5 and 12 hours before launch. Therefore, we determined that NASA took corrective actions to meet the intent of the recommendation.

Committee Recommendation 2bii. The Committee identified alleged cases of inappropriate alcohol use by astronauts in the immediate preflight period. The Committee recommended that NASA ensure that specific policies regarding alcohol use, including but not limited to a mandatory alcohol-free period prior to flight and the availability and use of alcohol in crew quarters, are in place and enforced.

Management Actions. See Management Actions in response to the previous recommendation (Committee Recommendation 2bi).

Audit Evaluation. We did not visit crew quarters to determine whether the policies were followed. However, we verified that CA-08-20 states that alcohol is prohibited within 16 hours of space flight and that Kennedy NASA Policy Directive 1600.4 and Johnson Policy Directive 8710.1 provide policies for limited and responsible alcohol consumption in the astronaut crew quarters at Johnson and Kennedy, respectively. Therefore, NASA took corrective actions to meet the intent of the recommendation.

Committee Recommendations 2biii. The Committee recommended that NASA institute a mechanism to monitor and ensure that the concerns raised by crewmembers, flight surgeons, and other individuals are evaluated and acted upon.

Management Actions. Both the Flight Crew Operations Directorate Director and Assistant Director stated that NASA has existing policies and procedures that address this recommendation. In February 2008, NASA reported to Congress that since the Columbia accident, NASA leadership has ensured that mechanisms were in place for employees to raise flight safety and mission-success concerns without the fear of retribution. In 1987, the NASA safety reporting system was established for NASA employees to anonymously report safety and hazard concerns to upper management without fear of reprisal. The reporting system has since been expanded to cover all NASA operations, including space flights.

In addition, NASA established a technical authority for engineering, safety, and medical and health in NPR 7120.5D, “NASA Space Flight Program and Project Management Requirements,” March 6, 2007, as another way for people to report safety and mission-impacting concerns. The Astronaut Office Chief briefed NASA astronauts in January 2008 on management’s expectations that employees raise flight safety concerns to Johnson or NASA management.

In addition, the Flight Crew Operations Directorate conducted an anonymous survey of astronauts and flight surgeons from August through December 2007. The survey showed that both astronauts and flight surgeons were aware of the process to raise safety concerns through the chain of command or the NASA anonymous reporting system.

Audit Evaluation. We verified that NASA has an anonymous safety reporting system and that employees have been informed through various means about how to report concerns. We verified that the survey indicated that prior concerns raised were addressed by management and the person raising the concern received feedback. We also verified that NPR 7120.5D requires that a project plan describe a project’s internal processes for handling dissenting opinions. Finally, we verified that the NASA safety reporting system requires an entry documenting the actions taken to address any concerns raised. Therefore, NASA met the intent of the recommendation even though NASA did not institute a new mechanism to monitor and ensure that concerns raised by crewmembers, flight surgeons, and other individuals are evaluated and acted upon.

Committee Recommendation 2ci. The Committee recommended that NASA senior leadership must ensure and support policies and procedures that allow flight surgeons, trainers, astronaut peers, and others to raise concerns to leadership.

Management Actions. As discussed in the previous recommendation's Management Actions, NASA has an anonymous safety reporting system and created safety, engineering, and medical technical authority positions to whom employees can report safety and mission concerns. According to the Flight Crew Operations Directorate Director and the Space Medicine Division Chief, senior Headquarters and Johnson management issued e-mails explaining the reporting process and the importance of employees timely raising safety concerns. Johnson management said they continue to hold periodic employee meetings to emphasize the importance of employees reporting safety concerns and supervisors soliciting employee input. In addition, Johnson hangs safety posters throughout its buildings and provides information on reporting safety issues and concerns on NASA internal Web sites.

Audit Evaluation. In addition to the Management Actions we evaluated in response to Committee Recommendation 2biii, we witnessed posters throughout NASA and reviewed letters from senior management encouraging employees to report safety issues without reprisal. Therefore, corrective actions implemented in response to Committee Recommendation 2biii as well as this recommendation met the intent of the recommendation.

Committee Recommendation 3bi. The Committee found that continuity of care over time with a single provider increases the quality of medical care. However, NASA's health care system is highly fragmented and does not promote continuity of care due to the large number of flight surgeons who can potentially provide care to any one astronaut. The Committee recommended that NASA review flight surgeon assignments and restructure where possible to enhance continuity of care and consider assigning each astronaut to a team of two to three flight surgeons who are responsible for providing or overseeing every episode of care, whether or not they are the mission-assigned flight surgeon.

Management Actions. The Space Medicine Division Chief reviewed the Department of Defense's medical process for assigning pilots to a small team of doctors and reviewed the operations of three prominent non-NASA medical clinics. The Space Medicine Division Chief, who is also a retired military physician, concluded that NASA astronauts and medical personnel could not effectively operate under the Department of Defense's model because NASA's medical operations are not similar to the Department of Defense's medical operations. However, the Space Medicine Division Chief identified opportunities for improvement during his review of the three prominent non-NASA medical clinics' operations, to include identification of strategies to improve the quality of care and astronaut safety. To improve continuity, consistency, and quality of care to patients, each flight surgeon's assignments were reviewed and flight surgeons were permanently assigned to the flight medicine clinic used by the astronaut versus having a rotational assignment through the clinics. This resulted in a smaller group of flight surgeons treating the astronauts. Additionally, a flight surgeon was assigned to review

each astronaut's medical records whenever a medical action was performed. In May 2008, the Space Medicine Division's six clinics were reorganized under one branch to standardize care, improve communications between the providers, and improve the quality of treatment by enhancing primary care provided to astronauts. Five additional Space Medicine Division quality care committees were formed, along with the existing Space Medicine Division committees to assist managers with improving the Space Medicine Division operations.

Audit Evaluation. We verified that the Space Medicine Division reviewed the medical process for the Department of Defense and other external entities, and reorganized the clinics. We agree that organizationally placing all clinics under one branch results in a less fragmented structure. We also agree that continuity of care for an astronaut should be improved by reducing the number of flight surgeons who treat the astronaut and assigning a flight surgeon to each astronaut to review the medical record after each medical action. Therefore, we concluded that NASA implemented corrective actions that met the intent of the recommendation.

Committee Recommendation 3bii. The Committee recommended that psychologists shift from only providing "patient" care for treatment of disease to assist astronauts in assessing areas of strength and weakness and provide skills to optimize mission success.

Management Actions. Space Medicine Division management stated that behavioral health providers were already providing performance enhancement to all astronauts prior to the Committee's recommendation. Specifically, Johnson's "Behavioral Health Performance Program Plan, Definition and Implementation Guide" (JSC 27384, November 1999), states that behavioral health providers concentrate on enhancing employee performance versus identifying mental health problems (diseases). Behavioral health providers conduct operational psychology training of astronauts and their families on the psychological factors of long-duration missions. In October 1999, the providers developed a 3-day training course, "Expeditionary Workshop," for astronauts assigned to long-duration missions. The training course included training on self-care and self-management, conflict management, cross-cultural communication, and leadership. Behavioral health providers also debrief astronauts who participate in extensive training events.

To address the recommendation, the Space Medicine Division assessed the behavioral health services it provides to the Astronaut Office and hired an additional psychologist and a psychiatrist. Additionally, the behavioral health providers reviewed best practices from non-NASA psychologists who work in industrial, organizational, and business industries.

Audit Evaluation. We verified that the behavioral health providers were already providing performance enhancement to all astronauts, according to the training and guidance described in Management Actions, prior to the Committee's recommendation. In addition, the hiring of a psychologist and a psychiatrist should augment the behavioral health services provided to the astronauts. Therefore, NASA met the intent of the

recommendation even though the Space Medicine Division did not change its performance enhancement processes as specifically recommended.

Committee Recommendation 3ci. The Committee found that astronauts do not receive a periodic psychological evaluation after they become an astronaut candidate, unless selected for a long-duration mission. The Committee recommended that behavioral health evaluations be integrated into the annual flight physical for all astronauts, regardless of mission assignment status, whether long-duration, short-duration, or unassigned. These evaluations should include recognized screening instruments for issues such as depression, anxiety, relationship stress, substance use, and the cumulative effects of normal life events and should be conducted by the flight surgeon responsible for the continuity of the astronaut's care in consultation with behavioral health.

Management Actions. In August 2008, the Space Medicine Division Chief directed the behavioral health providers to include a 30-minute behavioral wellness evaluation as part of an astronaut's annual medical examination beginning October 1, 2008. The Chief stated that the behavioral wellness evaluation should encompass the astronaut's NASA career status, professional training and workload, sleep and fatigue, peer and management relationships, social and family life, greatest professional and personal challenges, and primary goals for the coming year.

On March 23, 2009, the Space Medicine Division Chief issued SD-09-021, "Annual Astronaut Behavioral Health Exam," which states that a licensed and credentialed psychiatrist will perform annual exams to assess an astronaut's behavioral health. The psychiatrist will document whether the astronaut is qualified or disqualified from active flying status, and those cases that are disqualified will be brought before the Aerospace Medicine Board.

Audit Evaluation. We did not review medical records to ensure that they included a 30-minute behavioral wellness evaluation as a part of the astronaut's annual medical examination. However, we verified that the Space Medicine Division issued guidance to the behavioral health providers to institute the 30-minute behavioral wellness evaluations. We also reviewed the behavioral wellness evaluation interview questions and determined that the discussion topics should address the Committee's concerns on issues such as depression, anxiety, relationship stress, substance use, and the cumulative effects of normal life events. Therefore, NASA has taken corrective actions to meet the intent of the recommendation.

Committee Recommendation 3cii. The Committee recommended that behavioral health providers provide regular training to flight surgeons regarding behavioral health assessment and treatment.

Management Actions. In response to this recommendation, behavioral health providers stated that flight surgeons have always received general space flight behavioral health prevention and support training even though there was no formal policy to do so. The behavioral health providers conducted behavioral health assessment and treatment

training for the flight surgeons in July 2008 and January 2009. On March 23, 2009, the Space Medicine Division Chief issued SD-09-020, "Flight Surgeon Training in Behavioral Health and Performance," to formally require behavioral health providers to conduct an annual training session for flight surgeons. The training should include a description of the behavioral health services offered, specific stresses known and treated in the Astronaut Corps, and training that will help the flight surgeon identify behaviors that should be reported or addressed.

Audit Evaluation. We verified that the Space Medicine Division Chief issued a policy for annual behavioral health assessment and treatment training for flight surgeons and that the BHP providers conducted the aforementioned training in July 2008 and January 2009. Therefore, NASA implemented actions that met the intent of the recommendation.

Committee Recommendation 4ai. The Committee recommended that the process and medical criteria used to select astronauts for flight be explicit, available to each astronaut, and made as far in advance as possible to decrease the anxiety, speculation, and uncertainty surrounding space flight selection.

Management Actions. The Flight Crew Operations Directorate policy, "Crew Assignment Process," October 2001, defines the Astronaut Office's process for selecting astronaut crewmembers for a mission and informing astronauts of their flight eligibility and mission requirements. Specifically, the Astronaut Office Chief briefs the astronauts on NASA's selection process and the specific criteria for each mission's crew selection. A flight surgeon discusses health issues as well as medical certification for flight with each astronaut during the annual physical examination. In addition, the Flight Crew Operations Directorate had a formal process to inform the astronauts of their flight eligibility status and progress throughout the training process prior to the Committee's recommendation. Specifically, Johnson's Astronaut Evaluation Board reviews each astronaut's flight status and performance after each training exercise and mission. The Astronaut Evaluation Board recommends to the Astronaut Office Chief whether the astronaut should be eligible, conditionally eligible, or ineligible for flight assignments based on the astronaut's level of performance. The Astronaut Office Chief then verbally discusses the astronaut's eligibility with the astronaut. According to Johnson officials, these processes are still in place.

Audit Evaluation. We verified that prior to the Committee's recommendation, the Flight Crew Operations Directorate had formal, documented processes for notifying astronauts of the crew selection process and the medical and performance qualifications for flight. Therefore, NASA meets the intent of the recommendation even though the Flight Crew Operations Directorate did not change its selection and notification process.

Committee Recommendation 4bi. The Committee stated the Flight Crew Operations Directorate is primarily responsible for providing National Outdoor Leadership School and NASA extreme environment mission operations exercises to astronauts that focus on group and interpersonal skills. The Committee recommended that these two programs be evaluated for their usefulness in astronaut selection, evaluation, and training. Behavioral

health experts should be included as part of planning and the astronaut selection, training, and evaluation team for these and other related environment exercises.

Management Actions. The Flight Crew Operations Directorate Assistant Director and the Space Medicine Division Chief stated that astronaut training and exercises, including the National Outdoor Leadership School and NASA extreme environment mission operations exercises, have always been used by Flight Crew Operations Directorate management to assess which astronauts will be selected as permanent astronauts and crewmembers. The Astronaut Office Chief commented that the astronauts enjoy and benefit from such training; however, funding and astronaut time constraints affect the frequency of these two specific courses. Further, behavioral health providers stated that they have always been involved and continue to be involved in the planning, training, and evaluating of analog courses for astronaut candidates and astronauts.

Audit Evaluation. We verified that Flight Crew Operations Directorate management has a process for using various criteria, including performance on training and exercises, to determine whether astronaut candidates will become permanent astronauts and which astronauts will become crewmembers. We reviewed documents that showed that National Outdoor Leadership School and NASA extreme environment mission operations exercises have been used in the past and that behavioral health providers provided briefings to the astronauts involved. Therefore, NASA met the intent of the recommendation even though the Flight Crew Operations Directorate did not change its processes related to analog training and exercises.

Committee Recommendation 6ai. The Committee recommended that NASA develop privacy policies and procedures that ensure that individual astronaut electronic medical records are viewable only on a strict need-to-know basis by clinicians directly involved in relevant aspects of astronaut care. In addition, the Committee recommended that privacy policies related to astronaut medical records should be consistent with civilian standards of practice and Federal privacy laws.

Management Actions. In response to this recommendation, on July 31, 2008, the Space Medicine Division Chief issued “BHP Provider Rules and Regulations” and BHP 1.00, “BHP Documentation Standards.” Among other things, these policies outlined safeguards to protect the privacy of astronaut electronic records. The BHP Provider Rules and Regulations state:

1. Electronic medical records must be filed in a secure area away from the view of non-medical personnel, including patients;
2. Computer screens must be turned so that patient information is not visible to others;
3. E-mails containing confidential patient medical information must be sent encrypted;

4. Each provider is responsible for ensuring privacy during patient appointments by keeping voices low and office doors closed; and
5. When behavioral health examinations of the opposite gender are conducted, an administrative assistant or another provider is recommended to remain elsewhere in the office suite.

In addition, BHP 1.00 states that behavioral health clinical records will be kept in a uniform, legible fashion; available to authorized behavioral health personnel on a timely basis; protected by prudent safeguards from unauthorized inspection; and maintained as a hard paper copy or as a component to a secure electronic medical record. The policy also states that behavioral health providers will transfer clinical information to outside physicians, psychiatrists, psychologists, and hospitals on a timely basis when properly authorized, per the Privacy Act of 1974, or when otherwise required to do so by law.

Audit Evaluation. We did not review astronaut medical records to determine whether they were accessed only on a need-to-know basis. However, we verified that these two policies address the privacy concerns related to access to electronic medical records raised by the recommendation. Therefore, we believe that NASA has taken corrective actions to meet the intent of the recommendation.

Committee Recommendation 6di. The Committee found that the flight medicine clinic has received consultations from the Joint Commission responsible for the accreditation of health care organizations; however, no formal external review or accreditation has been performed. The Committee recommended that NASA establish a program of external peer review of its medical and behavioral health staff.

Management Actions. The Chief Health and Medical Officer stated that NASA clinics are not required to be accredited. Nevertheless, the Space Medicine Division Chief stated that the flight medicine clinic had a procedure for quarterly internal peer reviews involving flight surgeons. However, a similar peer review procedure did not exist for the behavioral health providers. Therefore, in July 2008 the Space Medicine Division issued BHP 5.00, "BHP Peer Review Program," to require quarterly internal peer reviews. The first review was conducted in the second quarter of 2009.

In addition, the Office of the Chief Health and Medical Officer conducted biennial peer reviews of the medical clinics in 2005 and 2007; however, the behavioral health clinic's operations were not reviewed. Therefore, the Office of the Chief Health and Medical Officer developed a checklist of behavioral health issues to be reviewed during the peer reviews. As part of the Chief Health and Medical Officer's review of Johnson in May 2009, an independent, non-NASA behavioral health provider conducted a review of the behavioral health program and provided a written assessment. The Chief Health and Medical Officer reported on September 29, 2009, that Johnson's BHP Program was compliant with NASA requirements.

The Space Medicine Division Chief stated that external (non-NASA) peer reviews will be conducted when needed. For example, prior to the Nowak incident, the Space Medicine Division was in the process of obtaining an external peer review of the behavioral health program. However, he said that a formal policy requiring regular peer reviews does not exist because the reviews are costly, physicians with an aeromedical background are not readily available, and the Space Medicine Division has concerns about the exposure of astronaut privacy information to the public.

Audit Evaluation. We reviewed BHP 5.00 related to internal peer reviews, the results of the last three Office of the Chief Health and Medical Officer reviews, and the written assessments of the last two behavioral health reviews conducted by independent, non-NASA behavioral health providers.. In addition, we reviewed two external reviews of the behavioral health clinic performed since the Nowak incident. We determined that the actions taken address the Committee's concerns. Therefore, NASA implemented corrective actions that met the intent of the recommendation.

Committee Recommendation 6ei. The Committee found that dependents of astronauts have the choice of seeing community providers or NASA providers for medical, dental, and behavioral health care. The Committee recommended that NASA establish policies and procedures that ensure that dependents receive quality care if they see community providers.

Management Actions. The Space Medicine Division Chief stated that NASA could only control the quality of care provided by NASA providers and cannot control the quality of care provided by a community provider that the patient selected. In addition, the Space Medicine Division said it had procedures for patient referrals for medical health issues (Medical Staff Rules and Regulations, February 22, 2006) prior to the Committee's recommendation. A similar patient referral procedure for mental health was issued on July 31, 2008 (BHP Provider Rules and Regulations). The Space Medicine Division Chief stated that beyond the referral process, the Space Medicine Division does not have any control over which community provider a dependent may use.

Audit Evaluation. We agree that NASA has no control over which non-NASA community health provider a dependent may see. We verified that the Space Medicine Division had medical and behavioral health procedures for referring patients to providers not affiliated with NASA. Therefore, NASA met the intent of the recommendation even though the Space Medicine Division did not establish new policies and procedures to address the Committee recommendation.

Committee Recommendation 6fi. The Committee recommended that all behavioral health providers have access to the patient's electronic medical records. A patient in the behavioral health clinic should have the visit recorded in the electronic medical record, and a disposition should be made by a flight surgeon. The full behavioral health note does not need to be included in the electronic medical record. The behavioral health provider can discuss the case by phone or in person with the flight surgeon.

Management Actions. The Space Medicine Division Chief developed “BHP Provider Rules and Regulations” to ensure that astronaut visits are recorded in the electronic medical record and that all medical and behavioral health care providers have access to appropriate medical records. BHP 1.00, “BHP Documentation Standards,” requires that the flight surgeon record every patient contact and any aeromedical disposition in the electronic medical record; however, the specifics on the behavioral health condition and services provided do not need to be detailed in the electronic record. The Division Chief said that when needed, the behavioral health provider can discuss specific cases that affect the mission with the responsible flight surgeon. The Space Medicine Division Chief stated that all behavioral health providers have been briefed on this process. In addition, access to medical records by providers is managed through the established flight medicine clinic’s records access application process.

Audit Evaluation. We did not review medical records to ensure that behavioral health visits were recorded or that they included a disposition by a flight surgeon. However, we verified that “BHP Provider Rules and Regulations” addresses electronic record privacy and confidentiality. We also verified that BHP 1.00 requires that flight surgeons record every patient contact and any disposition in the electronic medical record; however, as indicated above, specifics on the patient’s behavioral health do not need to be detailed in the electronic record. Therefore, NASA has taken corrective actions to meet the intent of the recommendation.

Committee Recommendation 7a(1). The Committee found that Johnson had well-defined procedures for the flight medicine clinic; however, a documented credentialing and privileging process did not exist for the behavioral health clinic. Primary source verification occurs during the hiring process for flight surgeons, when the original source is contacted to verify the accuracy of the provider’s qualifications. The Committee recommended that NASA establish one credentialing and privileging authority for both flight surgeons and behavioral health providers, with documented processes for accountability, primary source verification, and peer review.

Management Actions. The Space Medicine Division Chief stated that all NASA health care providers are licensed by a Government agency to practice medicine by the applicable medical association (American Medical Association or American Psychiatric Association). In addition, the State of Texas requires licenses for health care providers. Therefore, all NASA providers have a medical or psychiatric license.

On July 31, 2008, the Space Medicine Division issued BHP 2.00, “BHP Initial Appointment to Medical Staff”; BHP 5.00, “BHP Peer Review Program”; BHP 6.00, “BHP Psychiatrists and Psychologists Primary Source Verifications”; and BHP 9.00, “BHP Clinical Staff Reappointment,” that address hiring, credentialing, and privileging of health care staff. In addition, since October 1, 2007, all Space Medicine Division behavioral health providers have had their credentialing and privileging authority updated.

Audit Evaluation. We did not review the credentialing and privileging authority for the behavioral health providers. However, we verified that these four procedures are in place to ensure that behavioral health providers' licenses, training, and qualifications are authenticated prior to hiring; clinical privileges are determined and reassessed periodically; and other Johnson providers randomly review behavioral health providers' records each quarter. Therefore, NASA has taken actions to meet the intent of the recommendation.

Committee Recommendation 7bi(1). The Committee stated that there are no standard operating procedures for the behavioral health clinic and no standard operating procedures for the flow of information regarding astronaut care or how information is used. In addition, the Committee stated that no written procedures exist to explain how mission readiness is determined or how it is communicated to the clinic. The Committee recommended that NASA develop written procedures in these areas.

Management Actions. The Space Medicine Division used the existing flight medicine clinic's procedures to develop 10 standard operating procedures for the behavioral health clinic that were issued on July 31, 2008. The specific procedures are "BHP Provider Rules and Regulations"; BHP 1.00, "BHP Documentation Standards"; BHP 2.00, "BHP Initial Appointment to Medical Staff"; BHP 3.00, "BHP Patient Access to Clinical Records"; BHP 4.00, "BHP Patient Rights and Responsibilities"; BHP 7.00, "BHP Privacy Act of 1974, as amended Operating Plan"; BHP 8.00, "BHP Release of Privacy Act Information"; BHP 9.00, "BHP Clinical Staff Reappointment"; BHP 10.00, "BHP Suspected Family Violence Management"; and BHP 11.00, "BHP Suspected Abuse and Neglect or Exploitation Management."

Audit Evaluation. We did not review medical records or day-to-day operations to ensure implementation of the standard operating procedures. However, we verified that these 10 procedures provide documented guidance for the behavioral health clinic's operations as well as the flow of information regarding astronaut care and how information is used. In addition, BHP 1.00 documents how mission readiness is determined and communicated to the clinic. Therefore, NASA has taken corrective actions to meet the intent of the recommendation.

Committee Recommendation 7di. The Committee found inconsistent attendance at Johnson's Aerospace Medicine Board meetings by its members, which may result in members making decisions without considering all applicable information. Therefore, the Committee recommended that NASA restructure Board membership to ensure depth of experience and consistent attendance.

Management Actions. During the Committee's review, the only NASA guidance applicable to Board operations was NASA Charter 1000-12, "NASA Medical Policy Board and Aerospace Medicine Board," July 25, 2007. NASA Charter 1000-12 stated that the Board, a clinical and implementation body at Johnson for addressing crew medical qualifications, was composed of five flight surgeons (a chair and four members),

with one having an aerospace medicine certification. Under the charter, the chair and three members constituted a meeting quorum.

To address the Committee recommendation, the Space Medicine Division Chief developed “Johnson’s Aerospace Medicine Board Policies and Procedures Manual,” which outlines the process for ensuring that astronaut program applicants and astronauts are medically fit for assigned training and flight duties, referred to as fitness for duty. The Manual defines the Board’s authority, responsibilities, membership, meeting quorum, reporting, decision making, and waiver requirements. Board membership now consists of a chair, alternative chair, an executive secretary, and four additional members for a total of seven members. At least two of the seven members must have an aerospace medicine certification and all seven must attend every Board meeting or send a replacement. All members in attendance have input on agenda issues; however, the chair makes the final determination on all actions. The chair implemented the changes to the Board’s organization and attendance, as stated in the Manual, on December 17, 2009.

In addition, the Chief Health and Medical Officer revised NASA Charter 1000-12 to ensure the requirements in the Manual and charter did not conflict. The Chief Health and Medical Officer made changes to the charter related to Board operations and issued the revision, Charter 1000-26, “NASA Medical Policy Board and Aerospace Medicine Board,” on December 15, 2009.

Audit Evaluation. We reviewed and compared the old policy to the revised NASA Charter and Johnson’s policies and procedures manual. In addition, we compared the new and revised documents. Both documents addressed the Board membership’s restructuring, expertise required, and meeting attendance rules. We also confirmed that at least two of the current members had certifications in aerospace medicine and that four physicians were appointed as members and a permanent alternative chair was designated. Therefore, NASA implemented actions that met the intent of the recommendation.

Committee Recommendation 7ei(1). The Committee stated that the astronauts’ concern about the protection of their privacy prevents effective communication regarding patient status between behavioral health and other medical providers and limits the ability of the flight surgeons to appropriately assess an astronaut’s medical eligibility. The Committee recommended open and regular communication between flight surgeons and behavioral health officials. While appropriate confidentiality must be maintained, the Committee stated that collaboration between all health care providers must take place to ensure the highest quality of care, optimum mission support, and consistent astronaut performance.

Management Actions. The Space Medicine Division Chief found that the behavioral health clinic lacked operational procedures; therefore, his office issued five BHP procedural documents on July 31, 2008, to address privacy, confidentiality, and patient and provider rights requirements. Specifically, “BHP Provider Rules and Regulations” requires that behavioral health providers complete a medical record for all visits or encounters to improve the continuity of care provided by the medical and behavioral health providers. In addition, BHP 3.00, BHP 4.00, BHP 7.00, and BHP 8.00 address

patient rights to (1) have an explanation of the diagnosis and treatment plan, (2) process a complaint regarding their care, (3) appeal a behavioral health decision, (4) have their medical records safeguarded from those without a need to review, and (5) obtain their medical records. Additionally, the behavioral health clinic and the five medical health clinics were reorganized under the Clinical Services Branch (within the Space Medicine Division) to provide consistent management and improved communications between providers. Branch personnel attend monthly meetings where operations and policies are discussed. In addition, the Space Medicine Division Chief stated that medical and behavioral health providers meet as needed to discuss specific patient information that is pertinent for patient care or NASA's mission (see the discussion of Recommendation 6fi, page 18).

Audit Evaluation. We did not review astronaut medical records to ensure implementation of the five BHP procedural documents. However, we verified that the Space Medicine Division Chief developed behavioral health clinic procedures that address patient privacy, provider's roles, and the completion of medical records. We reviewed the Space Medicine Division's Quality Committee's meeting minutes, which documented attendance by both medical and behavioral health providers and discussions regarding various clinical issues. We believe that reorganizing the clinics into one branch should improve management oversight, consistency of operations for the clinics, and the ability of the medical and behavioral health providers to share pertinent patient information that would enhance quality of care and optimize mission support. Therefore, NASA has taken actions to meet the intent of the recommendation.

Committee Recommendation 9ai. The Committee recommended that NASA establish and enforce a formal, written astronaut code of conduct.

Management Action. In response to the Committee's recommendation, the Astronaut Corps developed a code of conduct: "Astronaut Code of Professional Responsibility." The code was posted on the Home Page of the Astronaut Office's Web site on February 25, 2008, and is displayed in meeting areas throughout the office space of the Flight Crew Operations Directorate. The Astronaut Office Chief also conducted a briefing with the astronauts in January 2008 to discuss the Astronaut Code of Professional Responsibility.

Audit Evaluation. We reviewed the code of conduct and verified that it is on the Astronaut Office's Web site and displayed throughout the Flight Crew Operations Directorate office space. Therefore, NASA implemented actions that met the intent of the recommendation.

Committee Recommendation 11ai. The Committee expressed a need to identify and share human factors concerns or issues among all organizations involved in astronaut activities. Human factors are personal and professional circumstances, such as low proficiency or stressors related to a medical condition, psychological or social adjustment, or professional problems, which may interfere with an individual's ability to aviate effectively. The Committee recommended that NASA create a human factors council, patterned after the

Navy's model, to identify and mitigate astronaut human factors concerns. This council could bring together the multidisciplinary representation from all organizations involved in astronaut activities and enhance leadership's knowledge of how an astronaut is functioning in a variety of settings.

Management Actions. The Flight Crew Operations Directorate Assistant Director said that it uses Johnson's Astronaut Evaluation Board to address human factors issues. This Board was established in April 2000 to assist Flight Crew Operations Directorate management in providing competent and technically proficient astronauts who are ready for mission assignment. The Astronaut Office reviewed the Navy's human factors council model as suggested by the Committee. In addition, the Flight Crew Operations Directorate examined incorporating the model into all crewmember evaluations and operations within the Directorate and has an effort underway to incorporate the model into normal operations within other Flight Crew Operations Directorate divisions, as appropriate.

In addition, behavioral, conduct, and other personal issues are addressed by the Astronaut Office Chief and the Flight Crew Operations Directorate Director. Astronaut medical issues affecting flight status are addressed during biweekly meetings between the Space Medicine Division Chief and the Astronaut Office Chief. The Flight Crew Operations Directorate also performs a Crew Resource Management Review to summarize the current state of crew resource management training across the aviation community. This includes a review of NASA's status compared to the Navy, Air Force, and Continental Airlines with regard to training. Based on the review, the Flight Crew Operations Directorate developed a Crew Resource Management Implementation Plan for developing standards and simulations.

Audit Evaluation. We obtained a copy of the policy and procedures document for the Navy's human factors council,³ which provides a formal process for communicating human factors issues to the commanding officer. The Navy's Human Factors Board is convened whenever a crewmember's or pilot's ability to perform flight duties safely is in question. The Navy Board provides an individual plan of action to mitigate identified problems and reintegrate the individual to full performance of assigned duties. The commanding officer can then use the information for risk assessment and subsequent decisions regarding safety of flight issues.

We determined that the Navy Board operates similarly to the Astronaut Evaluation Board. Specifically, Johnson's Astronaut Evaluation Board determines the flight status of each astronaut as eligible, ineligible, or conditionally eligible; decides upon corrective action, if necessary; and passes recommendations of flight status and corrective actions to the Astronaut Office Chief for final disposition. The Astronaut Office Chief or the Flight Crew Operations Directorate Director may convene an Astronaut Evaluation Board at any time to review cases. In addition, an Astronaut Evaluation Board will normally

³ "Human Factors Council and Human Factors Board Policy and Procedures," available online at <https://www.netc.navy.mil/nascweb/sas/files/5420-2.pdf> (accessed May 14, 2010).

convene to review astronauts completing flight assignments and astronaut candidate training or other astronauts recommended for review by their branch chief. Because the purpose of Johnson's Astronaut Evaluation Board is similar to the Navy Board, we concluded that NASA met the intent of the recommendation even though the Flight Crew Operations Directorate did not change its processes.

Committee Recommendation 11bi. The Committee recommended that NASA ensure that the Astronaut Office is structurally and functionally organized to provide enduring supervisory relationships that extend over years and are not limited to technical or mission assignments. Supervisors should be senior astronauts, and each should have a manageable number of astronauts to supervise. These supervisors should report to the Astronaut Office Chief.

Management Actions. Flight Crew Operations Directorate management stated that the current structure of the Astronaut Office is optimized to provide quality supervisory relationships while meeting mission requirements of the Space Shuttle and ISS programs. The Astronaut Office is organized into branches by technical and operational areas of expertise with experienced astronauts as branch chiefs. The branch chiefs are not formal supervisory positions in the NASA human resources system due to the astronaut mix (civilian, military, and international) and the rotation between technical and flight assignments that are expected during an astronaut's career. In the traditional role, formal supervisors usually stay in their positions for several years. Designating astronauts in supervisory positions limits an astronaut's ability to receive future flight assignments. In addition, military astronauts cannot be permanently placed in a position that is not actively involved in training for flight missions. The branch chiefs are rotated every 2 years to assist the Flight Crew Operations Directorate in training the astronauts for leadership positions. To ensure continuity, the Flight Crew Operations Directorate maintains a civil service chief engineer's position in each branch.

Audit Evaluation. We believe that Johnson management's decision to have nonsupervisory astronaut branch chiefs is justified, because permanently assigning astronauts to supervisory positions would limit an astronaut's availability to train for future missions. In addition, we agree that necessary continuity can be provided through a chief engineer's position. Therefore, we concluded that NASA met the intent of the recommendation even though the Flight Crew Operations Directorate did not change the management structure.

Committee Recommendation 11ci. The Committee recommended that Astronaut Office supervisors be trained in the same or similar manner as other NASA supervisors, with added training and support for issues specific to astronaut functions.

Management Actions. The Flight Crew Operations Directorate reviewed the training completed by each Astronaut Office supervisor and determined whether additional training was needed on a case-by-case basis. The Flight Crew Operations Directorate had the "Human Resource Management for Leaders in the Flight Crew Operations Directorate" course developed based on an existing Johnson human resources

management class offered to supervisors. This course was offered on May 7, 2007. The Flight Crew Operations Directorate Assistant Director stated that additional training of the leadership team will be provided as needed and new astronaut supervisors will be given appropriate leadership and management training.

Audit Evaluation. We verified that leadership and communication training courses were provided to astronauts, including those in supervisory and nonsupervisory positions. Therefore, NASA implemented actions that met the intent of the recommendation.

Committee Recommendation 11di. The Committee recommended that NASA ensure that all astronauts undergo comprehensive annual and mid-year evaluations by line supervisors that integrate all available work-related information in addition to task-specific technical assignment evaluations.

Management Actions. NPR 3430.1C, "Employee Performance Communication System," May 1, 2007, requires that performance planning discussions, mid-term, and year-end appraisals be conducted for all employees, including astronauts. The Flight Crew Operations Directorate branch chiefs have face-to-face performance discussions with astronauts in their respective branch, and the Astronaut Office Chief is responsible for ensuring the discussions have occurred.

The Flight Crew Operations Directorate surveyed the Astronaut Corps in January 2008 and found that the civilian astronauts were satisfied with the performance evaluations and feedback received; however, the military astronauts wanted more performance feedback from the Astronaut Office. The Astronaut Office Chief stated that he subsequently implemented the same performance feedback process for the military astronauts; however, the formal performance evaluation is not completed by the Astronaut Office, but rather the military.

Audit Evaluation. We did not review performance records to ensure that Flight Crew Operations Directorate supervisors conducted mid-year and year-end appraisals. However, we reviewed NASA's process for astronaut evaluations and verified that the Astronaut Office Chief requires comprehensive annual and mid-year evaluations. In addition, NASA developed a task-specific assessment tool, the Astronaut Personal Feedback form, to address the recommendation. Therefore, NASA has taken actions to meet the intent of the recommendation.

Verbal Recommendation. During congressional testimony, the Committee Chair recommended that NASA conduct a thorough, anonymous survey on the relevant issues in the Committee's report.

Management Actions. The Flight Crew Operations Directorate management used NASA and academic specialists to develop, conduct, and analyze results of a survey of Astronaut Office personnel and flight surgeons in January 2008. The survey focused on four areas: the relationship between astronauts and flight surgeons; raising and responding to issues of flight safety and crew suitability for flight; astronaut

understanding of performance expectations, crew assignments, and space flight alcohol use policies and procedures; and astronaut understanding of how to report a flight safety risk due to alcohol use on launch day. NASA collected data anonymously from flight surgeons and astronauts to determine whether current policies and procedures should be changed. Survey results identified organizational strengths, such as the ability to raise safety concerns to managers, as well as areas for improvement related to astronaut performance evaluations and transparency of crew selection.

Audit Evaluation. We verified that NASA conducted a survey of Astronaut Office personnel and flight surgeons. We reviewed the survey results to identify whether the survey results affected any of the Committee recommendations and determined that NASA made changes in policies and procedures in response to areas identified as needing improvement. We also verified that the Astronaut Office Chief briefed the astronauts on the survey results. Therefore, we concluded that NASA implemented actions that met the intent of the recommendation.

Five Safety and Mission Assurance Recommendations Addressed

The report issued by the Chief of Safety and Mission Assurance, “Space Flight Safety Review (Alcohol Use in the Preflight Period),” August 28, 2007, included six recommendations. We determined that Johnson and Kennedy either took actions or had processes in place that satisfied the intent of five of the six recommendations related to procedures on launch day, alcohol use by crewmembers, and conduct of crewmembers on the ISS. NASA did not take action to address the remaining recommendation related to alcohol testing of its employees (see page 30).

First Recommendation. The Chief of Safety and Mission Assurance recommended that a flight surgeon be located in the suit room during suit-up to allow more direct contact with the crewmembers on launch day and to reduce the reliance on a suit technician (non-clinician) to identify any last-minute medical issue.

Management Actions. Both the Flight Crew Operations Directorate and Space Medicine Division management stated that NASA already had processes in place that address this recommendation. The Assistant Director of the Flight Crew Operations Directorate stated that the mission-assigned flight surgeon and astronaut supervisor are with the crew on launch day from wake-up in the crew quarters until launch. Further, NASA documents the suit technicians assisting the astronauts with their space suits during each launch via video recording and displays the video on NASA television. Since the suit-up room can only accommodate the crew and suit technicians, a flight surgeon cannot be located in the room. However, the flight surgeon and astronaut supervisor can view the activity from outside the room or on monitors that record the activity. The Space Medicine Division Chief added that a visual check of each astronaut is on the flight surgeon’s checklist.

Audit Evaluation. We verified that the flight surgeon's checklist includes a visual assessment of the astronauts up to 9 hours before launch. We found that CA-08-14, "Kennedy Astronaut Crew Quarters Policy," April 14, 2008, states that the mission-assigned flight surgeon, astronaut supervisor, and other managers stay in Kennedy's astronaut crew quarters prior to launch. Therefore, NASA has met the intent of the recommendation, even though it does not intend to locate a flight surgeon in the suit room during suit-up.

Second Recommendation. The Chief of Safety and Mission Assurance recommended that NASA expand the existing NASA policy, CB-91-111, "High/Medium Risk Activity Policy," June 1991, to include drinking to excess as one example of a high-risk activity.

Management Action. The Flight Crew Operations Directorate Director revised the policy and issued CA-07-43, "High/Medium Risk Activity Policy," on August 31, 2007, to state that astronauts should use good judgment and that even low-risk recreational activities, when combined with too much alcohol, can be a high risk that could affect the mission. The policy was distributed to all astronauts and Astronaut Office management and is posted on the Astronaut Office Web site.

Audit Evaluation. We verified that the policy included the risk of drinking to excess and that the revised policy was distributed to the astronauts and available on the Astronaut Office Web site. Therefore, NASA implemented actions that met the intent of the recommendation.

Third Recommendation. The Office of Safety and Mission Assurance found that the General Services Administration (GSA) had regulations governing alcohol use but that non-GSA NASA facilities had no similar regulations. Therefore, the Chief of Safety and Mission Assurance recommended that Johnson finalize its draft policy, "Alcohol Use in the Astronaut Crew Quarters." Further, once completed and approved by the Johnson Director, this document should be filed with the highest-ranking law enforcement organization at the Center.

Management Actions. Johnson Policy Directive 8710.1, "Alcohol Consumption in the Astronaut Crew Quarters," finalized on October 3, 2007, states that astronauts can use alcohol in the crew quarters when off duty and that any NASA employee in the crew quarters should act responsibly when using alcohol. In addition, the assigned supervisor is responsible for monitoring alcohol use within the crew quarters. The policy also states that persons violating this policy can be subject to disciplinary action. The directive was published in the NASA Online Directives Information System (NODIS) and on the Astronaut Office Web site. According to Johnson's Protective Services Chief, once a directive is online, Johnson's highest-ranking law enforcement official is responsible for complying with and enforcing the directive.

Audit Evaluation. We determined that Johnson Policy Directive 8710.1 defines the responsibilities for crewmembers' alcohol use while in the crew quarters and the fact that violating this policy can result in disciplinary action. We confirmed that the policy is

available to all Johnson employees from NODIS and through the Astronaut Office Web site. Therefore, NASA implemented actions that met the intent of the recommendation.

Fourth Recommendation. The Chief of Safety and Mission Assurance recommended that Kennedy complete a policy document on alcohol use in the astronaut crew quarters and the astronauts' recreational activities at the beach house⁴ similar to Johnson's policy. Once approved by the Kennedy Director, this document should be filed with the highest-ranking law enforcement organization at Kennedy.

Management Action. Kennedy NASA Policy Directive 1600.4, "Alcohol Consumption in the Astronaut Crew Quarters," was revised on October 18, 2007, to mirror Johnson's policy. The revised policy states that astronauts can use alcohol responsibly in crew quarters and the beach house when off duty, astronauts and employees should act responsibly when using alcohol, the supervisor should monitor the use of alcohol, and violating the policy can result in disciplinary action. The directive was published in NODIS and on the Astronaut Office Web site.

Audit Evaluation. We determined that Kennedy NASA Policy Directive 1600.4 defines the responsibilities for alcohol use while in the crew quarters and the beach house and that violating this policy can result in disciplinary action. We verified that the policy was available to NASA employees and accessible from the Astronaut Office Web site. Based on the Johnson Protective Service's Chief's response to the previous recommendation, we determined that Kennedy's highest-ranking law enforcement official would be responsible for enforcing the directive. Therefore, we concluded that NASA had implemented actions that met the intent of the recommendation.

Fifth Recommendation. The Office of Safety and Mission Assurance found that the ISS Multilateral Crew Operations Panel (the Panel) had not developed the details of the disciplinary policy as stated in the "Code of Conduct for the ISS Crew," issued in September 2000. The Chief of Safety and Mission Assurance recommended that NASA work with the Panel to assess and document the need for additional details in the disciplinary policy.

Management Actions. The Panel is composed of representatives from ISS international partners, including the United States, Russia, Canada, Japan, and participating European countries who make international policy decisions for the ISS. The Flight Crew Operations Directorate Assistant Director stated that NASA provided its disciplinary policy to the Panel; however, all ISS partners must agree to the final policy. He added that NASA has input on the ISS disciplinary policy for crewmembers and can always take disciplinary actions against NASA crewmembers. Therefore, as an ISS partner and member of the Panel, NASA officials said they will continue to work toward finalizing a disciplinary policy for ISS crewmembers.

⁴ A Kennedy facility located on the beach but within the Center's grounds that is used for training and business-related functions.

Audit Evaluation. We reviewed the Panel’s meeting minutes from October 2007 through October 2008, which verified that the disciplinary policy is in development. We also reviewed NASA’s charts used to brief the Panel on NASA’s disciplinary policy and determined that NASA has worked with the Panel to finalize a disciplinary policy. Therefore, we determined that NASA took steps to meet the intent of the recommendation.

NASA HAD NOT COMPLETED OR TAKEN ACTIONS TO ADDRESS TWO RECOMMENDATIONS

We found that NASA had not addressed 2 of the 39 recommendations made by Johnson, the Committee, and the Office of Safety and Mission Assurance. First, NASA Headquarters had not issued a NASA-wide policy to test NASA astronauts and other employees for alcohol. Second, NASA had not addressed whether astronauts should be included in NASA's Personnel Reliability Program, nor had NASA addressed the finding that NASA civil service and military astronauts are not required to report all illness, injuries, or medication use so that the responsible NASA entity can determine whether the astronauts are fit to perform their assigned duties.

NASA Had Not Addressed the Recommendation on Alcohol Testing

In August 2007, the Chief of Safety and Mission Assurance reported to the NASA Deputy Administrator that NASA has the authority under Title 42, United States Code, Section 2473c (42 U.S.C. 2473c), "Drug and Alcohol Testing," December 1991, to test civil service employees in safety-sensitive, security, or national security functions for alcohol. According to 42 U.S.C. 2473c, the testing program should provide for pre-employment, reasonable suspicion, random, and post-incident testing for use of alcohol or a controlled substance. The Office of Safety and Mission Assurance found that the NASA Administrator, when implementing this authority, had established a drug-testing program but not an alcohol-testing program. In "Space Flight Safety Review (Alcohol Use in the Preflight Period)," August 28, 2007, the Chief of Safety and Mission Assurance recommended that NASA evaluate the implications of implementing the authority to test employees, including astronauts, for alcohol and make a decision. The Chief of Safety and Mission Assurance added that post-mishap testing and testing based on reasonable suspicion would be prudent for all flight safety critical employees, including astronauts, but he did not specifically recommend that NASA take this action.

The Office of Human Capital Management began drafting a policy addressing alcohol testing of NASA employees in the second quarter of FY 2008 in response to a recommendation issued to NASA in the Aerospace Safety Advisory Panel (Panel) Annual Report for 2006, dated June 19, 2007. This report was issued prior to the initiation of the Safety and Mission Assurance review. The Panel found that there was not a NASA-wide requirement for random drug and alcohol testing of contractors and recommended that NASA expand testing to contractors, as well as to employees. When we met with the Office of Human Capital Management in July 2009, they were unaware of the recommendation made by the Chief of Safety and Mission Assurance regarding

alcohol testing. Based on our review of the proposed policy, we believe that the new policy will address the Chief of Safety and Mission Assurance's recommendation. However, since the Office of Human Capital Management has not finalized the draft policy for issuance, the Safety and Mission Assurance review recommendation remains open.

NASA Had Not Taken Action to Ensure Astronauts Report All Health Care Issues

The Committee found that NASA civil service and military astronauts were not required to report illness, injuries, or medication use unless the astronaut determines the information to be significant. The Committee stated that this practice is a major deviation from the military's Personnel Reliability Program, where the military physician, who is qualified to make a determination as to whether an individual is fit for duty, must evaluate every episode of illness, injury, or medication. Therefore, the Committee recommended that NASA astronauts be included in NASA's formal Personnel Reliability Program.

According to Title 14 of the Code of Federal Regulations, Subpart 1214.5, "Mission Critical Space System Personnel Reliability Program," December 1990, NASA's Personnel Reliability Program is designed to ensure that civil service personnel assigned to mission-critical positions or duties meet the screening requirements for background checks. However, NASA's Personnel Reliability Program did not require employees to provide information on their illnesses, injuries, or medications. Even though the NASA Office of Protective Services suspended NASA's Personnel Reliability Program on June 10, 2009, we determined that including astronauts within NASA's Personnel Reliability Program would not have addressed the Committee's finding that astronauts were not required to report illnesses and non-NASA care. The Assistant Director of the Flight Crew Operations Directorate and Johnson's Space Medicine Division Chief concurred with our analysis.

NASA requires that astronauts receive an annual physical examination from a NASA flight surgeon. During this examination, the astronaut is required to report all medical and behavioral health conditions and treatment provided by non-NASA providers. Moreover, the astronaut is required to sign a form certifying that the information provided is complete and accurate. However, an astronaut assigned to a flight mission could receive medical and behavioral health care services from providers not affiliated with NASA without NASA's knowledge in the period between annual certifications. Therefore, to fully address the Committee's finding, NASA should establish a requirement that astronauts, upon assignment to a mission, certify that all episodes of health care received from providers not affiliated with NASA have been reported and that they will continue to report such care until the mission is completed. We discussed this revised recommendation with the Assistant Director of the Flight Crew Operations Directorate and the Space Medicine Division Chief, who both agreed that this type of

action would better address the Committee's finding and could be implemented by NASA. As of April 2010, however, NASA had not taken actions to address the Committee's finding. Therefore, the recommendation remains open.

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

In order to close outstanding recommendations, we recommend the following:

Recommendation 1. The Assistant Administrator, Human Capital Management should issue policy establishing a NASA-wide program to test employees, including astronauts, for alcohol.

Management's Response. The Assistant Administrator for Human Capital Management nonconcurred with the recommendation. She stated that while an Agency-wide team has worked hard since late 2006 in response to the Panel recommendation, changes in Administration and the Agency's senior leadership and subsequent changes in direction to the Agency's mission and budget, as well as various new initiatives of the new Administration that significantly impact the incoming, current, and outgoing workforce, has prevented the current Administrator and Deputy Administrator from being briefed on the various legal issues and complexities relative to the establishment and implementation of a requirement to conduct alcohol testing of civil service employees. However, she stated that the Office of Safety and Mission Assurance, the Office of Human Capital Management, and the Office of General Counsel will work toward staffing a final Agency decision on alcohol testing of civil service employees.

Evaluation of Management's Response. In light of the Assistant Administrator's pledge to reach a final Agency decision regarding testing NASA employees for alcohol, we are resolving the recommendation. We will close the recommendation when management issues a final decision on the matter.

Recommendation 2. Johnson's Space Medicine Division Chief should develop and implement a policy that requires newly assigned mission crewmembers to provide an update on any medical and behavioral health conditions and treatment received since their last annual examination. The policy should also require the crewmember to certify in writing that (1) the information provided on the form is true and accurate, (2) every instance of medical and behavioral health care received by non-NASA providers has been reported, and (3) every medical and behavioral health care condition and treatment received from non-NASA providers will be reported until the mission is complete.

Management's Response. The Assistant Administrator for Human Capital Management concurred with the intent of the recommendation. She stated that having astronauts sign an agreement upon assignment to a mission does not satisfy the intent of the Committee's original recommendation, as astronauts are assigned years before flight, not between the

annual physical and the actual mission. The astronauts currently sign a standard form (SF-93, Report of Medical History) during their annual physical. The SF-93 contains a certification that the information provided is true and complete to the best of the signor's knowledge. In addition to the SF-93, the Space Medicine Division and Astronaut Office have added a statement to the annual family history form that states: "I understand that I am required to report all medical and behavioral health care received outside of NASA in the interim period between annual physicals to the flight Medicine Clinic or Behavioral Health Clinic as soon as possible."

Evaluation of Management's Response. We obtained and reviewed the revised annual family history form. Management's actions are responsive to the recommendation. Accordingly, the recommendation is closed.

NASA WAS UNABLE TO ADDRESS ONE RECOMMENDATION

NASA was unable to address one Committee recommendation concerning psychological testing evaluations. The Committee recommended that NASA fully integrate behavioral health information derived from psychological testing evaluations into the final selection process of astronaut candidates if the information is found to be useful. Although NASA hired nine astronaut candidates in May 2009 using psychological testing evaluations in their selection, NASA cannot yet determine whether the behavioral health information was helpful. Specifically, it can take up to 8 years from the time NASA hires an astronaut candidate to the time the astronaut returns from his or her first long-duration mission. Therefore, to determine whether the behavioral health information collected during the hiring process was useful, NASA will need to observe the performance of the new astronauts for a period of time greater than the year that has elapsed since their hiring.

Committee Recommendation

The Committee found that while psychological testing evaluation is conducted during the hiring of astronauts and is intended to identify applicants who can adapt most readily and perform effectively in the extreme environment of space flight, this information is rarely and inconsistently used in the hiring of astronauts. Further, details of methods, criteria used, and optimal performance data for psychological testing either do not exist or were not made available to the Committee for review. Therefore, the Committee recommended that NASA make the use of this information in the astronaut hiring process (see Recommendation 1ci, page 5).

The Committee also recommended that if the behavioral health information is found to be useful, it should be fully integrated into the final selection of astronaut candidates. Although NASA addressed and implemented recommendations to use psychological testing evaluations during the hiring process for the May 2009 astronaut candidate class, NASA concluded that it cannot yet determine whether that information was useful. Specifically, the Space Medicine Division Chief stated that although the recommended psychological testing was implemented, it would be some period of years before NASA will know whether the testing was successful or whether changes are needed. NASA officials said it can take up to 8 years from the time NASA hires an astronaut candidate to the time the astronaut returns from his or her first long-duration mission. The officials said that they will measure the outcomes from the data collected in the years ahead. Further, the Space Medicine Deputy Chief stated that progress made toward implementing this recommendation would be included in the reviews performed by the Office of the Chief Health and Medical Officer every 2 years.

RESULTS

We reviewed the report of the most recent review, performed in May 2009. The report stated that those responsible for behavioral health were in full compliance with the tool used to determine implementation of the Committee's recommendation. However, we found that the tool does not yet include a specific determination of whether behavioral health information used to identify applicants who can adapt most readily and perform effectively in the extreme environment of space flight was useful. Therefore, NASA needs additional time to assess its progress in implementing this recommendation, and we are not making a recommendation at this time.

Scope and Methodology

We performed this audit from February 2009 through May 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Scope Limitation. Our fieldwork was limited to the review of NASA's actions to address the recommendations. Therefore, we did not attempt to validate the findings made by Johnson, the Committee, or the Office of Safety and Mission Assurance. In addition, verifying implementation of the recommendations in some instances would have required entering the astronauts' preflight quarantined environment, reviewing documentation containing personally identifiable information, or reviewing medical records, which are subject to the privacy rules of the Health Insurance Portability and Accountability Act of 1996. Finally, we did not test the effectiveness of NASA's actions taken to implement the recommendations.

Work Performed. To identify the 39 recommendations, we reviewed congressional testimony and the three reports of the reviews performed by Johnson, the Committee, and the Office of Safety and Mission Assurance:

- "Johnson's Internal Assessment of Medical Practices after Nowak Incident," June 2007.
- "NASA Astronaut Health Care System Review Committee February–June 2007 Report to the Administrator," July 16, 2007.
- "Space Flight Safety Review (Alcohol Use in the Preflight Period)," August 28, 2007.

We performed fieldwork at NASA Headquarters and Johnson. We conducted interviews with managers and personnel located at Headquarters in the Office of the Chief Health and Medical Officer, the Office of Safety and Mission Assurance, the Office of Human Capital Management, and the Space Operations Mission Directorate. In addition, we conducted interviews at Johnson with Flight Crew Operations Directorate managers, the Director of the Space Life Sciences Directorate, Space Medicine Division managers and behavioral health professionals, and the Human Adaptation and Countermeasures Division manager. We analyzed Headquarters, Johnson, and Kennedy documentation to

determine whether NASA had taken actions or had processes already in place that met the intent of the recommendations. Additional details on the work we performed are included in the finding discussions.

Use of Computer-Processed Data. We did not use computer-processed data to perform this audit.

Review of Internal Controls

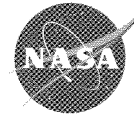
Our review of internal controls consisted of a review of Headquarters, Johnson, and Kennedy policies and procedures that existed, were developed, or were revised as a result of the three reviews. We identified a need for additional controls related to an alcohol testing policy and the reporting of health care services provided to astronauts by providers not affiliated with NASA. See page 30 for a discussion of these issues.

Prior Coverage

During the last 5 years, the NASA Office of Inspector General and the Government Accountability Office have not issued any reports of particular relevance to the subject of this report. The reports from the three NASA reviews are listed earlier in this appendix.

MANAGEMENT COMMENTS

National Aeronautics and
Space Administration
Headquarters
Washington, DC 20546-0001



June 16, 2010

Reply to Attn of: **Office of Human Capital Management**

TO: Assistant Inspector General for Audits
Office of Inspector General

FROM: Assistant Administrator for Human Capital Management

SUBJECT: Response to Draft Audit Report, "NASA's Astronaut Corps: Status of
Corrective Actions Related to Health Care Activities" (Assignment
No. A-09-005-01)

We appreciated the opportunity to review this report and acknowledge the Office of Inspector General's (OIG) concurrence that our actions were responsive to the recommendations of the various reports you reviewed as part of your audit work. The subject draft audit report had two remaining recommendations to which we wish to provide additional information on actions taken or underway to address the findings.

The recommendations read:

Recommendation 1: The Assistant Administrator, Human Capital Management should issue policy establishing a NASA-wide program to test employees, including astronauts, for alcohol.

Response: The Agency non-concurs with the OIG's recommendation. Since late 2006 under the leadership of then Deputy Administrator, Shana Dale, an Agency-wide team of representatives from the Offices of Safety and Mission Assurance (OSMA), Human Capital Management (OHCM), Procurement (OP), General Counsel (OGC), Protective Services (OPS), and the Chief Health and Medical Officer (OCHMO) has worked very hard to address a similar recommendation from the Aerospace Safety Advisory Panel (ASAP) (ASAP 2006-03-04), Random Drug and Alcohol Testing – *Recent mishap investigation revelations indicate that there does not seem to be an Agency-wide requirement for random drug and alcohol testing among contractors.* ASAP recommends that expanding both random pre-incident and targeted post-incident testing would be well advised for contractors as well as NASA civil service.

Significant progress was made and specific actions have been taken to address this recommendation, as outlined in the Agency's response to ASAP 2006-03-04. However, with the change in Administration and the Agency's senior leadership and the subsequent change in direction to the Agency's mission and budget; various new and aggressive initiatives of the new Administration that significantly impact the incoming, current, and outgoing workforce; and other Agency priorities, there has not been an opportunity for the current NASA

Administrator and Deputy Administrator to be briefed on the various legal issues and complexities relative to the establishment and implementation of a requirement to conduct alcohol testing of civil service employees. OSMA, OHCM, and OGC will work toward staffing a final Agency decision on alcohol testing of civil service employees.

Recommendation 2: Johnson's Space Medicine Division Chief should develop and implement a policy that requires newly assigned mission crewmembers to provide an update on any medical and behavioral health conditions and treatment received since their last annual examination. The policy should also require the crewmember to certify in writing that (1) the information provided on the form is true and accurate, (2) every instance of medical and behavioral health care received by non-NASA providers has been reported, and (3) every medical and behavioral health care condition and treatment received from non-NASA providers will be reported until the mission is complete.

Response: Concur with the intent. Having astronauts sign this agreement upon assignment to a mission as suggested in your draft report does not satisfy the intent of the original recommendation, as astronauts are assigned years before flight, not between the annual physical and the actual mission. The astronauts currently sign the SF-93 form during their annual physical that contains the following:

"I certify that I have reviewed the foregoing information supplied by me and that it is true and complete to the best of my knowledge. I authorize any of the doctors, hospitals, or clinics mentioned above to furnish the Government a complete transcript of my medical record for purposes of processing my application for this employment or service. I understand that falsification of information on Government forms is punishable by fine and/or imprisonment."

The Space Medicine Division and Astronaut Office concurs with the intent of the recommendation and in addition to the SF-93 above, have added the following to the signed interim history form, so that both retrospective and prospective care is reported:

"I understand that I am required to report all medical and behavioral health care received outside of NASA in the interim period between annual physicals to the Flight Medicine Clinic or Behavioral Health Clinic as soon as possible."

The action was completed as of June 8, 2010, with a copy provided to the OIG staff. We will consider this recommendation closed on issuance of the final report.

If you have any questions regarding this response, please contact Steve Golis, OHCM audit liaison representative at 202-358-1211 steve.golis@nasa.gov. For technical issues related to Recommendation 1, contact Cathy Dunwoody at 202-358-2451 cathy.dunwoody@nasa.gov and for technical issues related to Recommendation 2, contact Mark Weyland at 281-483-6193.



Toni Dawsey

cc:
HQ/Chief, Safety and Mission Assurance/Mr. O'Connor
HQ/Chief Health and Medical Officer/Dr. Williams
HQ/General Counsel/Mr. Barrett
HQ/Executive Officer/Space Operations Mission Directorate/Mr. Allen
JSC/AA111/Center Director/Mr. Coats
JSC/SD111/Chief, JSC Space Medicine Division/Dr. Polk
JSC/CA111/Director, Flight Crew Operations Directorate/Mr. Jett
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JULY 6, 2010

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NASA Headquarters
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