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**Statement of
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before the

**Subcommittee on Space and Aeronautics
Committee on Science and Technology
U. S. House of Representatives**

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to address the Subcommittee on the subject of flight crew safety.

My name is Bryan O'Connor, NASA's Chief, Safety and Mission Assurance. I report directly to Dr. Griffin on matters dealing with ground and flight safety, and I have policy and functional oversight responsibility for the safety organizations assigned to each of the Centers across the Agency, as well as to all Agency programs. My counterpart for health and medical matters is Dr. Rich Williams, NASA's Chief Health and Medical Officer, as well as the Agency's Designated Safety and Health Official. He has policy and functional oversight over of all health and medical activities at NASA. We both have oversight of astronaut-related activities; my emphasis is on safety and his is on health. I have a close relationship with the Johnson Space Center Director, Mike Coats, who is responsible for the health and safety of the astronauts. We and our delegates all share seats at readiness reviews and management councils as the agendas dictate. I have no direct oversight over health or behavioral issues except as they become or threaten to become safety issues. We ensure that appropriate safety and medical experts are members of human experimentation safety reviews, and we require medical or human factors professionals on all of our mishap investigation boards. Finally, following a recommendation from the Challenger accident, there is a standing flight safety panel chaired by an experienced astronaut who supports my human spaceflight activities, including selected assessments and readiness reviews.

There are several high level directives outlining NASA's health and safety programs, the highest being NPD 8710.2, NASA Safety and Health Program. Below that policy directive are other policy documents that outline responsibilities and contain requirements and standards for our programs. Examples are directives on occupational health and safety, emergency preparedness, and mishap reporting. Under our program management policies is the NASA Human Rating Requirements directive. All of these directives outline responsibilities for people in operations, medical and safety organizations. My organization has the authority to assure compliance with these policies and requirements. When we conduct audits, we always include appropriate operational and medical professionals to evaluate compliance with requirements in their areas of expertise.

The Astronaut Health Care System Review Committee Report

In its final report, dated 27 July, 2007, the Astronaut Health Care System Review Committee found the following: “Interviews with flight surgeons and astronauts identified episodes of heavy use of alcohol by astronauts in the immediate preflight period, which has led to flight safety concerns.” Specifically, the report noted that “Two specific instances were described where astronauts had been so intoxicated prior to flight that flight surgeons and or fellow astronauts raised concerns to local on-scene leadership regarding flight safety. However, the individuals were still permitted to fly.” The report findings, if true, describe a serious close call. NASA takes this matter very seriously as it represents a threat to our mission, and is a clear affront to NASA’s core values of safety, integrity, teamwork and mission success. To address this potentially serious safety risk, NASA decided that a review of the events and circumstances was required. The Deputy Administrator chartered me to conduct a review that would evaluate the Committee’s finding related to the inappropriate use or abuse of alcohol by astronauts in the immediate preflight period. My charter further calls for a review of existing policies and procedures related to alcohol use and space flight crew medical fitness during the immediate preflight preparation.

The Committee report offered three recommendations related to their alcohol abuse finding which cover policies dealing with alcohol use and abuse as well as communication management of safety concerns by crewmembers and flight surgeons.

My approach to the review was to learn as much as I could about the reported allegations in order to establish the nature and scope of any flight-day impairment and subsequent override of legitimate flight surgeon or crew objections. This would enable a more informed course of action in our policies, procedures, risk mitigation strategies and communications systems. This review would be supplemented by ongoing safety and health actions responsive to other parts of the Committee report, an anonymous survey being prepared for distribution in September, as well as the several open and anonymous safety reporting systems already in place.

Scope and Method

Consistent with the serious implications of the Committee’s report, my focus was on alcohol use or abuse that would have resulted in impairment on the day of launch. Equally important in my review was the reported disregard by management for the flight surgeon’s or crew’s recommendation against flight. I did not review alcohol use in general or as an aircraft safety issue, although I did review relevant policies to ensure that they are or will be consistent for spaceflight, aircraft flying and other mission critical activities. My question was, “did we actually have a case where we strapped, or almost strapped, an impaired astronaut into a spacecraft over the objections of his or her flight surgeon, and if so, how did we get to that point, and what policies, procedures, risk mitigators do we need to change to avoid such an event in the future?”

The Committee Chairman provided a few important details about these incidents in his press conference, and a subsequent discussion with me, but he was unable to give us more information, references, timelines or sources for the reported allegations due to promised anonymity for witnesses. Therefore, I resorted to investigation techniques consistent with our other anonymous reporting systems. I reviewed relevant policies, procedures and near-launch timelines and staffing. I inspected the crew quarters facilities at both Johnson and Kennedy Space Centers, and interviewed managers familiar with the Cosmonaut crew quarters in Kazakhstan. I reviewed results from the Johnson Space Center and Space Shuttle Program hotlines, the NASA Safety Reporting System (NSRS), and NASA’s close call and mishap reporting systems for evidence related to astronaut alcohol abuse and space or aircraft flight. My data search went back 20 years, a time-span where U.S. astronauts flew 94 Shuttle missions and 10 Soyuz missions.

I also reached out to people who spent time as crewmembers or in support roles in the crew quarters at the Kennedy Space Center and the Baikonour Cosmodrome in Kazakhstan. This included current and former astronauts, flight surgeons, research and operations support nurses, Shuttle suit technicians, close-out-crew technicians, and the managers and staff of the crew (quarantine) quarters. I asked them to volunteer any information they could give me about this matter. Consistent with safety investigation techniques, I avoided leading questions, and medical privacy matters not directly related to flight safety, allowing the individuals to give me whatever information they considered relevant. I heard from more than 90 individuals representing all of the groups mentioned. Although I received a good response, there are, understandably, still some who might be reluctant to come forward without a guarantee of anonymity. Therefore, I made it clear to all possible witnesses that they could use the confidential hotline or the anonymous NASA Safety Reporting System to tell me their story. In summary, this was a safety review, not a disciplinary investigation. The NASA Inspector General has announced his intent to review the results of this review, and if necessary to follow as appropriate to his authority and oversight responsibilities.

Results

The results of my inquiry and data search to date are as follows:

1. Alcohol, mostly wine and beer, is available in the crew quarters quarantine facilities for use by astronauts during off-duty hours. This practice exists under a combination of societal norms and local standard operating procedures.
2. Of the thousands of government mishaps and close calls recorded since the inception of our electronic mishap databases in the late 80s and early 90s, none involved alcohol or drug use or abuse by an astronaut.
3. Of the 680 anonymous safety concerns reported to and investigated by the NASA Safety Reporting System since its inception in 1987, none involved astronaut alcohol or drug use or abuse.
4. Of the 863 Safety Hotline reports recorded since its inception in 1991 to the present, none involves alcohol or drug use or abuse by an astronaut.
5. Although Johnson Space Center does not reveal the identities of personnel involved in disciplinary actions, the most recent report to OSHA covering the years 2002 through 2006 includes a total of 7 such actions related to alcohol or drugs at the center. Informal input from Flight Crew Operations was that none of these involved astronauts.
6. Of the more than 90 individuals who answered my call for information, not one offered any evidence of alcohol use or abuse in the immediate preflight timeframe: Shuttle, Soyuz, or T-38, and none revealed any cases where management disregarded flight surgeon or crew concerns about crew alcohol and spaceflight.
7. Regarding relevant policy, there are some gaps in scope, and some areas in need of clarification.

My review revealed that, although alcohol is available to crewmembers, it is not known to be used during work hours or beyond the start of the mandatory sleep period, which begins at about 18 hours prior to launch for rendezvous missions (i.e. Space Station), and 12 hours before launch for other missions. Most people involved in the day of launch activities in crew quarters found it hard to imagine that a crewmember would put his/her mission and fellow crewmembers at risk by reporting on the day of launch impaired for space flight. Crewmembers reminded me that each one of them must be fit enough for an unaided emergency pad egress should there be a fire or other major emergency before liftoff. They practice this drill in the simulator and in the actual vehicle in the Terminal Countdown Demonstration

Test normally held a couple of weeks before scheduled launch. Even a few seconds delay in unstrapping and egressing from the Shuttle could cost lives, and executing this demanding task while wearing heavy flight equipment takes the speed, coordination, judgment, and situational awareness that only exist in a sober crewmember.

Then there is the lack of privacy. From the time the crew wakes on launch morning until they lift off, they are surrounded by crewmembers, managers, support crew, television crews, still photographers, crew quarters staff, etc. Breakfast, the first scheduled event, normally half a hour after wakeup, is in a room shared by their managers and other crewmembers. Shortly after breakfast, each crewmember receives a short final visit from the flight surgeon. Although this last medical checkup is limited, the doctors tell me that it is adequate to reveal signs of alcohol impairment. Lunch is in front of live television cameras and, after lunch, the live television cameras are there for close-ups as the suit technicians, one per crewmember, work closely with them through donning and system integrity checks. The doctors observe this activity as well. Walkout to the Astrovan is on live television and, when they reach the launch pad, the Close Out Crew helps the crewmembers don their parachute harnesses and strap them into their seats. These highly supervised, very public activities offer many opportunities to spot an impaired crewmember, whether from alcohol or some other sudden medical problem, before their impairment could affect the mission. Finally, the crew commanders know that they are responsible for the performance of their crew in the training and flight environment. They know that thousands of people and millions of dollars are involved in getting a Space Shuttle to this point in the countdown, and they know the challenges and risks inherent in space flight. They know that if one of their crewmembers reported for work on launch morning impaired by alcohol, and a crew commander failed to report that and take other appropriate actions, that they would be held accountable nearly as much as the offending crewmember.

The operation in Kazakhstan is similar to that at Kennedy Space Center, with some small differences. The crewmembers typically go to the Cosmonaut Hotel for quarantine two to three weeks before launch. Again, alcohol is available for off-duty hours, and there is a special ceremony held before the crew goes to the launch pad that involves a champagne toast. Those who have participated in this event told me that the amount of alcohol is very small, and most of the time, the crewmembers, Russian and American, only touch the glass to their lips. NASA flight surgeons did not express any concern to me about this ritual, even though it does violate the letter of most aviation alcohol policies. Another important difference in the Soyuz operation is that either the Russian or the U.S. flight surgeon has the authority to pull an impaired crewmember from the flight up to and including launch morning. The Soyuz crews have fully trained backups for just such emergencies. One area of concern was that there is not always a room for the NASA flight crew management representative, who must then live across the street with the crew families in another building. This could limit crew management presence in off hours. My report recommends that NASA work with the Russian Space Agency to ensure full time accommodation for crew operational manager(s) in the Cosmonaut Hotel, thus duplicating the full time oversight situation at KSC.

As for T-38 and other aircraft flight activities, astronaut pilots come to NASA only after years of operational and flight test experience. Any pilot with a prior record of poor judgment would not be competitive in the selection process. So, it is commonly expected that those selected for the astronaut corps have a reasonable level of maturity as well as flying skill. They are trusted implicitly to fly professionally, and the relatively low mishap rate of NASA T-38 operations speaks to that (no class A mishaps in over 20 years and nearly 160,000 flying hours). Technically, it would not be difficult for a crewmember to drink and fly impaired, especially when he or she is flying solo cross country. NASA's T-38 policy calls for 12 hours between the last drink and takeoff, and prohibits flying impaired. Also, most NASA astronaut T-38 pilots are active duty military detailees, and thus subject to the Uniform Code of Military Justice. They know that flying impaired, or acting in any manner unbecoming an officer on or off the job could be the first step to a court-martial. Having said that, some whom I interviewed admitted

that it is possible that someone could have inadvertently violated the 12 hour rule by a small amount at some time in their military or NASA flying career (note: the FAA imposes an 8 hour restriction on airline pilots). However, none of them admitted to ever violating or witnessing a violation of what is arguably the more important part of any alcohol policy – that flying while impaired is prohibited.

As I looked at our policies regarding alcohol and flight, I found several areas where they conflict with one another, or are lacking in scope, specificity or clarity. For example, shortly after the Committee report was published, we realized that there is no specific “bottle to throttle” rule for spaceflight, as had been in place for many years for T-38 operations. As an interim step, and while we review all our policies and procedures in this area, we have since applied the T-38 rules to space flight.

Summary

Although my review by nature was not, and probably could never be, exhaustive, it represents a great deal more investigation than what I would normally do in response to an anonymous safety concern. I received over 80 percent participation of the astronaut and 100 percent participation of the flight surgeon communities. These are high percentages of survey participation, considering the substantial numbers who were engaged in the recent Shuttle mission, training in all corners of the globe, or on summer leave.

I cannot say conclusively that none of the incidents reported to the Committee ever happened. However, I was unable to verify that they did. I am confident that there are enough safeguards in the form of doctors, managers, and witnesses in place to prevent an impaired crewmember from being strapped into a spacecraft. As for the relationships among flight crews, flight surgeons and operations and medical managers, I found as good a situation as I personally have seen in many years. The flight docs point with pride to the fact that, in over 25 years of Space Shuttle operations, including 119 Shuttle flights, not one has had to be terminated early for a crew medical problem. Although there may be occasional disagreements, I found that all parties understand their roles and authorities and the multiple safety reporting and appeal paths. Some or all of the reported incidents could possibly have happened during earlier times in the countdown where there are fewer witnesses and, if so, they would represent ground safety and flight schedule threats. Moreover, disregarding duly assigned flight surgeons on crew health matters is a serious matter, but the flight surgeon community was unanimous in their assurance that they have never been overruled or disregarded on a spaceflight safety call at launch time. This review was a focused look at the most serious implications of the Committee report. We will continue to monitor our anonymous reporting and other systems for indications of these kinds of problems. And, the safety community will continue to support the agency as it moves forward on the Health Committee’s recommendations.

I will be happy to answer any questions you may have.