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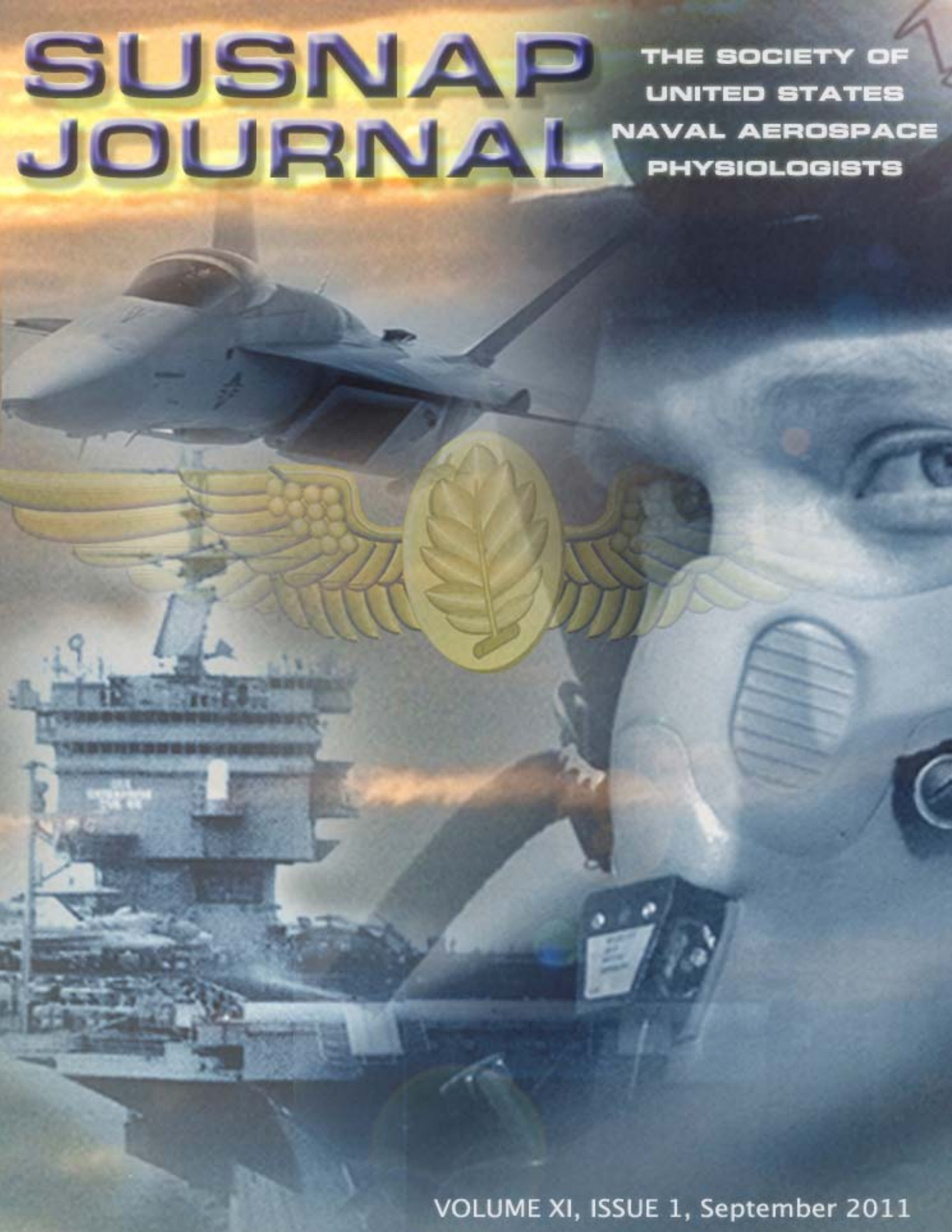
THE SOCIETY OF UNITED STATES NAVAL AEROSPACE PHYSIOLOGISTS



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The Weight Is Over: Part 1

LCDR Tom "VEGAS" Jones

SUSNAP President

Several times over the years the topic of "crew member nude body weight "restrictions has risen to the top of staff level discussions. I'm sure some of you reading this have been a part of those discussions. In 2011 it's once again a hot topic of discussion but for some new reasons.

1. NAVAIR 4.6 recent proposal to shrink the recommended upper weight ranges for NACES from 245lbs to 213lbs based on probable PLF injuries due to excessive parachute descent rates.
2. The reduction in recommended crew member weights for T-6 due to the modification away from Air Force PFE. (NAVY ALSS adds 14 more pounds then the maximum allowable ejection mass of 420lbs).
3. The lower weight restriction for aircrew flying with JHMCS (136lbs).

"So what?" Why would I as the CNATRA AMSO care about those changes? Why is it important for my chain of command? I had a good idea but until I started to dig into the instructions, history and all the data surrounding "crew member nude body weight" restrictions I wasn't 100% sure. So why are we concerned about anthropometric accommodation? Why do we measure our aviators and our aircrew? Who are all the key players in this process? Simply put. It's cheaper to build an aircraft with a certain size range of aircrew in mind vice trying to build one that fits everyone.

Since aircraft are designed with anthropometric accommodation factors then we must use anthropometrics to determine who will fit and who will not. In the past this wasn't conducted as precisely as it could have been. I specifically remember sitting in the bizarre wooden chair during my OCS in-physical at NAMI. I had no idea what it was at the time. All I knew was it must be another test for me to pass in order to make it to the next stage. I sat down and hoped for the best. Of course I immediately wanted to know how I did. I remember the corpsmen giving me the thumbs up and telling me. "You're O.K." "Next!"

Currently this process is conducted at Naval Aviation Schools Command (NASC) during the first week of Aviation Preflight Indoctrination. NASC is the Anthropometric Program Model Manager designated by Commander of Naval Air Forces (CNAF) and their measurement is the official measurement used for aviation pipeline selection. They're not in control of the **selection process** but they are in direct control of the **measurement process**. The wooded chair has since been replaced by an anthropometer and the NASC AMSO who wields it.

Every student is measured and weighted including Air Force students who are trained at Whiting field. All of their measurements are entered into the Naval Aviation Anthropometric Compatibility Assessment (NAACA) data base which produces an Anthropometric Restriction form. This form lists each individual's specific measurements and any aircraft restrictions they may have. However, if a student is outside of a "crew member nude body weight" for any particular platform the NAACA database does not call it out as a restriction. It identifies it as a risk but not as an official restriction. In the past, NASC would resolve the issue by generating an Increased Risk Acknowledgment form for the individual to sign. Both forms were placed in their Aviation Training Jacket and normally not looked at again until the individual was up for pipeline selection at the end of primary flight training.

During the week of pipeline selection the squadron student control department lists any and all pertinent information with regard to selection. The student's performance in primary in the form of a score or NSS, the student's pipeline preferences and anthropometric restrictions are annotated on the individual's selection card. If a student is restricted for excessive sitting height for the T-45 then they're limited from selecting Tailhook as a pipeline choice. However, students who were outside the "crew member nude body weight" restriction for T-45 could select the Tailhook pipeline because weight did not show up as a restriction per say. Even if the student control department noticed a problem with the individuals weight compatibility they would usually dismiss it once they noticed the signed risk acknowledgment form in their record. Essentially mistaking it for a waiver. This information is sent to CNATRA N3 for rack and stake and the selection list is posted every Thursday afternoon.

For those student pilots who select Tailhook they head on to Kingsville or Meridian earning wings of gold and eventually move on to fly some variant of the F-18 with JHMCS.

So back to my original questions….

Why would I as the CNATRA AMSO care about those changes? Why is it important for my chain of command? Mainly for the safety related issues surrounding the matter. Some are legitimate, others could be easily debated. But let's go ahead and assume that they are all legitimate.

As an officer assigned to the Safety Department it is our responsibility to identify any hazardous situation to the chain of command. Hopefully you can also provide several courses of action (COAs) to the commander allowing them to choose the best COA to mitigate the risk for the hazard. So what's the hazard associated with the weight changes? The hazards are clearly defined in the T-45 NATOPS manual. For light weight individuals:

1. Excessive pull back forces during the ejection sequence.
2. Poor positioning during ejection
3. Higher parachute opening shock during ejection above 300 knots
4. Seat instability during ejects above 300 knots.

For the CNATRA selection processes the weight change poses several challenges. We thought we had mitigated the risk through the use of risk acknowledgement forms. Not the case. Risk acknowledgement forms are not waivers and are no longer used. We thought we had prohibited lighter individuals from selecting strike however some have slipped through the cracks because of the flaws in the selection process discussed earlier. Unfortunately we have provided the fleet with a fully trained aviator that is not authorized to fly the aircraft without a waiver that only PERS-43 or CMC can grant. Even with a waiver for the seat it still does not remove the 136lbs JHMCS limitation which greatly impacts the readiness and lethality of a fleet squadron.

The largest non safety related issue is the impact on diversity. With the lower limit for MK-16 (Primary T-6) at 103lbs. but a lower limit of 136lbs. for NACES (T-45/F-18) it reduces the number of females available for Tailhook pipeline selection by nearly 50%.

What about the upper limit? 245lbs goes down to 213lbs. What's the risk above 213 lbs.?

1. Poor body position due to insufficient pull back forces during inertial reel retraction.
2. Higher descent rates during parachute landing.

The reduction in the upper limit has a significant production impact for CNATRA that reduces the number of students available that can be selected for Tailhook as well as the poll of instructor pilots available to teach. The possible reduction in fleet readiness has far greater national security implications..

In the past six months several meeting s have taken place as well as several high level phone conferences. Members involved have included NAVAIR 4.6, PMA-202, CNAF, PERS-43, HQ Marine Corps, AIRLANT and CNATRA. It has been determined by this group that a Hazard Risk Assessment (HRA) needed to be conducted. Based on the information provided in the HRA a way forward will be decided upon. More to follow in the next journal.

A New Dynamic Hypoxia Training Low Pressure Chamber Profile For Helicopter Aircrew

CDR Rich "IVAN" Folga

Director, ASTC Whidbey Island

Since 2001, our military has been thrust into routine operations at moderately high altitude (14-18K' MSL) with unpressurized aircraft, consisting mainly of helicopters. It has been suggested by many operators that renewed training for these excursions might be necessary if not required. Evidence of increased attention to hypoxia in helicopter operations was exhibited in a hypoxia-focused scientific panel titled "Out of Breath" at the 2008 meeting of the Aerospace Medical Association in Boston, MA. There were three papers presented regarding helicopter aircrew hypoxic effects, monitoring and aircrew protective equipment. Results of two of these studies described the measurement of hypoxia at moderate altitudes for helicopter aircrew. A US Army Aeromedical Research Laboratory (USAARL) paper was presented on the effectiveness of the Portable Helicopter Oxygen Delivery System (PHODS) mask at protecting aircrew at moderate high altitude. The three helicopter aircrew related studies all looked at SpO2 at altitudes between 16-18K' MSL. In the USAARL study looking at the effectiveness of the PHODS mask, subjects were allowed to remove supplemental O2 for 10 minutes at 10K', 15K' and 18K' MSL. The authors concluded that with proper physiological training the PHODS system will be effective at protecting helicopter aircrew flying at moderately high altitudes. In another recent paper, Smith (2005) studied the effects of altitudes below 10,000' MSL and found that the helicopter aircrew surveyed reported symptoms of hypoxia even at altitudes within the so-called physiological zone. Specifically, it was discovered that loadmasters reported more effects than pilots. Smith concluded that, "it may be inappropriate to emphasize the benign nature of the physiological zone during aviation medicine training of a non-resting population such as helicopter aircrew." Dr. Smith and I were both at that 2008 meeting where we discussed his paper adnauseam. My question on leaving the meeting was "what about training?" Fast-forward 16 months…

The U.S. Army Special Operations Aviation Regiment out of Ft Lewis, WA (now Joint Base Lewis-McChord, or JBLM) contacted me and requested NASTP Dynamic Hypoxia Training (DHT) for helicopter aircrew. The Army POC stated there was no requirement, but it was a local directive that if at all possible this training should be conducted for all aircrew. Ok, so now I have the same question as last year: what about training? What altitude? Do I even have the flexibility to adjust this to meet the customer's needs? Time to start digging.

Designing the Profile

It was obvious I would need to get approval to create a new low pressure chamber (LPC) profile if I wanted to do anything except the standard 25K' MSL Type II or Type III. The closest profile and the one we use nearly every week at Aviation Survival Training Center Whidbey Island (ASTCWI) is the Type III. Do I really want or need to go to 20K' MSL? Not if the Army prevented flights above 18K' MSL in unpressurized aircraft without a 30 minute pre-ox. What have other services done? I called an Air Force Physiology counterpart. He said the Air Force scrapped their helo chamber profile a while ago. He felt strongly that a well designed specific profile looking at not only physical symptoms but putting more emphasis on cognitive degradation would be a worthwhile cause. Agreed. I also recalled conducting Reduced Oxygen Breathing Device (ROBD) training on dozens of helo guys as part of the Aviation Commanders Course in Pensacola. They often stated the same thing: this would be great for training for our guys to get re-familiarized with their symptoms. OK, so perhaps we can find something else similar as an example. The Royal Danish Air Force incorporated a specific altitude chamber flight for Navy helicopter aircrew flying the Lynx helicopter over Greenland. The profile only went to 13K' MSL and thus was quite long and the most common symptom of this training was boredom. Aircrew were afforded 30 minutes above 10K' MSL total. The design of the profile incorporated an ear and sinus check and the use of physiologic measurements

during the training. A survey of refresher Indian Air Force aircrew conducted by Joshi and Thakur (2005) indicated that all helicopter respondents believed that hypoxia training should occur below 25K' MSL.

Since not all Army customers would have had a previous chamber flight, and at the time we were in cold and flu season, incorporating a 5K' MSL bounce into the proposed profile seemed to make sense. The proposed profile would simply continue after the bounce from S/L to 18K' MSL at 3K'/min and hold at just shy of 18K' MSL for up to 14 minutes with a total time above 10K' MSL of about 20 minutes. Considering 1 -2 minutes of de-saturation at each stop once O2 was removed in the USAARL study, there is little difference in overall exposure duration with this proposed profile. A good deal of background research on decompression sickness (DCS) and altitude exposure was reviewed by USAARL before conducting this study at the selected altitudes. Additionally, by not breaking the 18K' MSL level, we technically no longer needed the one hour "clean time" to observe the students. This was advantageous for crew requesting only DHT who wished to return back to JBLM the same day.

More Background

In a report by Cable (2003) on actual reported hypoxia incidents in Australian military aircraft, it was determined the "majority of symptoms occurred between 10,000 and 19,000 ft" and the most common cause of hypoxia in the aircraft was the failure of the mask or regulator, or a mask leak. This is precisely why we suggest this training for SOAR customers – this is in their operational range and exactly when they would be relying on that regulator and mask. By Army regulations, unpressurized flights above 18K' MSL require a 30 minute pre-breathe on minimum 90% O2. A realistic suggested ceiling of 18K' MSL meets the well established DCS threshold and matches Army regulation for unpressurized aircraft. Added realism comes from using the LPC possibly with MD-1 regulators set to normal air. Since aircrew will be wearing masks in flight above 14K' MSL, it is suggested aircrew in training don masks and set the regulator to normal air (at 14K' MSL) for the conduct of the demonstration. Once symptoms occur, aircrew simply turn the green regulator switch to the "on" position and select "100% O2" with the white diluter switch. This procedure could effectively provide "mask-on" training which has proven a valid concept with the ROBD.

Having gathered enough background information to pitch my case, I submitted a change request to the Naval Survival Training Institute (NSTI) with a new LPC profile and a brief paper justifying the change. It was agreed that the terminal altitude should be lowered to 17.5K' MSL but as far as courseware materials and the rest of the plan, NSTI and the Specialty Leader/Training Agent granted us approval to go forward.

Results

Sixteen students arrived on 18 November 2009 (eight pilots and eight enlisted aircrew) with Army upchits ready to train. I used a modified version of the DHT curriculum with slides customized for the training and customer mission. We also created a unique critique form and writing demos specific to crew position (pilot or crew chief). All sixteen completed the LPC profile and none of the students went on supplemental O2 before the mandatory call at 20 minutes above 10K' MSL or about 17.5 minutes at 17.5K' MSL. All students wore Nonin pulse oximeters throughout the entire fight above 10K' MSL. On debrief, each student reported having experienced at least one symptom, with some reporting as many as five. At the mandatory call for 100% O2, there were several SpO2 readings in the low 60's and all were well below the clinical hypoxia threshold. This was one of my biggest concerns – not having enough time at altitude to recognize symptoms. Clearly, the altitude was sufficient to produce symptoms at least in sea level dwellers. Had these soldiers come from a higher altitude residence would I have had enough time to cause subjective symptoms in all players? Perhaps the time limit should be extended to use different criteria for termination, such as SpO2 or number of symptoms? In the meantime, I would suggest perhaps extending this to a maximum of 25 minutes above 10K' MSL or mandatory treatment for a steady state reading of below 60% on the pulse oximeter. Also, none of the aircrew in the first few groups we trained had any problems breathing on the MBU-12 with the regulators set to normal air. In fact, most of the students thus far have indicated the mask-on aspect of training to be realistic and relevant. As for the 5K' MSL bounce for ear and sinus check, since these are all experienced aircrew, this may be unnecessary. It was painless and no one complained, but perhaps it is overkill. Suggest the 5K' MSL ear and sinus become an option for the Chief Observer to exercise should they choose to do so.

All Army aircrew are required to do an annual refresher aviation physiology course online. Since we were going to altitude in the chamber, I wanted them to understand potential hazards with exposure both with training and operations so all standard refresher helo aviation physiology and altitude chamber (hypoxia laboratory or O2 brief) objectives were covered via customized briefs. Additionally, all the objectives for DHT are required to be covered to give them the "Q" for the course. No complaints were observed from the students.

A second group of soldiers (Army Reserve) from JBLM were trained in May 2010 using the Army DHT method as previously described here. This group was not 4/160th SOAR but mixed CH-47 pilots, rated and non-rated aircrew. A new generic writing demo was developed from the MH-47 version that asked general questions that all CH-47 crewmembers were expected to be familiar with. The results were very similar to the first group. During this evolution, several soldiers elected to go on supplemental O2 before the mandatory call and all experienced at least one symptom of hypoxia including all participants having SpO2 readings below 87% at the conclusion of the demonstration. These students felt the hypoxia exposure was much more realistic than simply taking off the mask at 25K' MSL. These soldiers fly with the old-school, semi-portable Helicopter Oxygen System (HOS) and MBU-12 masks attached to feeder hoses from a cylinder/regulator feeder in the main cabin. These aircrew complained the regulators on the HOS were somewhat unreliable and they were actually removing their masks at times on flights because of faulty operation even during high task load and challenging mission stages such as a mountain rescue at Mt. Rainer. Acceptance of the training, both quality and content, was very high.

After training, several of the pilots expressed interest in using the ROBD in the future. It is a three hour drive from JBLM so the day could be really long if we had to break up the training into two blocks, especially since we would require a new ROBD profile that could take approximately 25 total minutes (hookup, train, debrief) per student. Unfortunately, we do not have the staff to support both ROBD and LPC operations simultaneously at ASTCWI so it would be advantageous if the Army could send aircrew and pilots separately should ROBD training be requested. Identifying and validating a good simulator flight model needs to happen before we go that far. A recommendation was made to NSTI Human Performance Training Technologies to develop a new ROBD profile that could be used for helicopter pilots should the Army request the ROBD option. It would be advantageous to have SH-60, MH-47G, CH-47 or similar cockpits for use with Laminar X-Plane.

Working directly with our JBLM customers we came up with some improved training realism by making aircraft and crew position specific writing demos. Looking at how well the writing demos were completed by hypoxic students I realized the data collected would be less than scientific, but still valid as to determine training effectiveness when combined with detailed critiques. One thing that seemed universal: all the Army customers felt they received quality training that was relevant to their mission.

We expected JBLM units would be requesting to send more folks our way to complete this training. In fact, by February 2011, we consistently had approximately one helo DHT course per month held in conjunction with underwater egress and underwater breathing training. At this point, the Army CH-47 mountain SAR crews from Lewis-McCord were stating they were transitioning to the PHODS nasal cannula system. For the latest training sessions in March/April/May 2011, we opted not to conduct mask-on training since the cannula is arguably not a mask. We used HGU series helmets and MBU-12 O2 masks but left those hanging until the students treated themselves. All students held out until near the mandatory call for treatment with supplemental O2. As stated previously, most of the soldiers have never had any form of DHT before and very few had ever worn an oxygen mask. The mask-on training component was well received with no complaints of air hunger or difficulty breathing as one might have expected. From this observation we can conclude that mask-on training for novel hypoxia familiarization in an LPC is viable and realistic.

The results from this entire effort were presented at the 2011 meeting of the Aerospace Medical Association in Anchorage Alaska. The title of the poster presented is *Development and Initial Validation of Dynamic Hypoxia Training for U.S. Army Helicopter Operations*.

A quick rundown of the products created or modified for this course:

Army helo DHT specific course evaluation

Army helo DHT specific Welcome Aboard, Altitude Threats and O2 briefs

Army helo DHT MH-47G aircrew and pilot specific writing demos/charts

Army helo DHT CH-47 generic writing demonstration

Helo DHT LPC profile as described above

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Helicopter Hypoxia: A True Story

ENS Chris Murr

Intern, ASTC Patuxent River

Is hypoxia training relevant for “rotorheads?” This was a question I considered while preparing for my initial Aviation Physiology brief for a refresher Naval Aviation Survival Training Program (NASTP) helicopter class. Instead of acting on my intuition, I decided to reach out to a former Navy H-60 pilot for an additional perspective. As I thought, we both came to the conclusion that the current NASTP brief is adequate in its coverage of altitude threats to include hypoxia, gas expansion, and decompression sickness. Case closed, or so I thought.

Five minutes into my discussion on hypoxia, all of my assumptions were shattered. While explaining the NATOPS oxygen usage rules, I casually asked, in a smirking manner, “Has anybody really flown above 10,000’ for an extended time without supplemental oxygen?” Out of the three hands that went up, one in particular began narrating an incredible story of human performance limitations. This is his story…

During a deployment to Afghanistan with a UH-60 Assault Battalion, I had to go on a recovery mission into the Hindu Kush Mountains which reach an altitude up to 24,000’. Prior to our deployment we knew that we would be working in this region. Therefore, all flight crews received high altitude training from the High Altitude Aviation Training Site (HAATS) in Colorado. This training ensured that we were familiar with the effects of flying at altitude above 10,000’ and the effects it had on aircraft and human performance. The rules the Army had set in place stated that you could fly up to 14,000’ for a period of 30 minutes before you either had to descend or use supplemental oxygen. HAATS instructors taught that the human body is capable of flying up to 18,000’ for up to 30 minutes or more before you degraded Effective Performance Time (EPT). There are many factors which factor into a pilot’s EPT but the two major factors are physical conditioning and the rate of ascent.

I was on a five minute emergency recall with a quick reactionary force. It was early in the morning so the temperatures were not at the day’s peak. We received a call that there was a Special Forces Team in need of immediate extraction. We did not have a specific grid to the team’s location and were only told what firebox the team was located. This meant I would have to search the entire area to find them. When I looked at the position on the map I realized that the altitudes ranged from 15,000’ up to 20,000’. I knew that we did not have any supplemental oxygen on our aircraft and we would be limited on the time we would have to search. After discussing the situation with my Company Commander and Battalion Commander, we decided to take on the mission with all associated risks. We did make one crew change concerning our crew chief because he was a smoker and we feared he would suffer from hypoxia before any other member of the crew. The second major factor that benefited us was that we were based at an altitude of 6000’and we were over two months into my 4th deployment. I was running an average of 20-25 miles a week at this altitude which I attribute to the ability to get up to 19,000’. In reality my body only assumed it was at 13,000 feet because I was conducting the same PT at 6,000’ that I normally conducted at sea level.

As we departed the airfield I plotted a course that would allow us to jump a few of the mountains at the lowest possible altitudes and get us to the target region before we had to break out above the 10,000' level. Once we arrived close to our destination we made a slow circling ascent up to the lowest mountains which were already above the 10,000' mark. I started a clock just so I knew how long we were above this altitude because at the 30 minute mark I was planning on descending below this point to ensure aircraft and crew safety. As we continued our search, our altitude continued to climb and the first signs of hypoxia were starting to set in after about 15 minutes and an altitude over 15,000'. At this altitude the entire crew stated that their breathing was becoming labored and we were all short of breath. We discussed our situation and decided to press on until we needed to depart the area. We did discuss a plan to escape the altitude by dropping off a steep cliff on the east side of the mountain and descending to the lowest altitude possible. We also decided to start transferring the flight controls after no more than five minutes to allow one pilot to take a break before they made a mistake on the controls. After 25 minutes we were at an altitude of 17,000' and I was having trouble controlling the aircraft. Not only had the aircraft performance degraded but my own ability to make the proper adjustments was becoming difficult. Had I been at normal altitudes I feel like I would have had no problem controlling the aircraft but my lack of concentration and degraded motor skills at this altitude were part of the problem. It was also at this time that my co-pilot stated that he was starting to feel nauseous. At this point we had decided that we would search for 5 more minutes then depart the area for lower altitudes. We continued up to 18,000', and at some point I realized I was having trouble putting my thoughts into words. I was starting to get a little bit confused. I was attempting to explain this to the crew, and I knew they were having trouble understanding what I was saying. I am not sure if they were in the same situation I was in, or if I just could not explain myself very well. It seemed that one of my crew chiefs was not really feeling all the effects that I was, so I asked him to help out and monitor systems such as altitude, airspeed and other cockpit instruments when possible. Flying was becoming a group effort. It was around the 35 minute mark or so that we came into radio contact with the ground forces. They tried to give me directions to their position but I was having trouble plotting it on my map. Luckily the UH-60 has an FM homing antenna that will direct you to a position with the use of a radio frequency. After speaking with the ground troops it seemed that I momentarily lost the signs of hypoxia and my adrenaline was running the show. We were close to an altitude of 19,000' when we arrived on the scene and landed the aircraft. After landing I transferred the flight controls to my co-pilot, opened my door and started to vomit. I knew we needed to depart the area as soon as possible. We picked up everyone that we could and marked the site for a follow on aircraft to come and pick up everyone else. We picked up the aircraft and left the area. Upon departure my co-pilot started to vomit as well. Our descent down the mountain was not as fast as I would have liked because simple tasks were becoming very difficult to perform. I remember wanting to turn the aircraft but the effort it took to make the aircraft turn was so difficult it was just easier to go straight down the mountain. I had to really think about any action I wanted to make the force myself to make it.

Once we were down below 10,000' for some time I remembered to stop my clock where I had been tracking our time at altitude. The clock was above the 50 minute mark, so I assumed we were at altitude anywhere from 40-50 minutes. It was also at this time I realized I had a pounding headache. Upon our arrival back home everyone in the crew felt horrible. We were forced to go see the flight medic who evaluated our status for the next few days. At some point during the day everyone got sick and my headache remained for three days. I also noticed that for the next few days I was tired and just not my normal self.

After the class, a Marine Colonel came up to me and said, “Son, you better not waste that nugget of information.” So here I am. Not wasting. This anecdotal account is now threaded into my briefs and has received high marks. I try to stress the Operational Risk Management strategy used and the physiological limitations associated with this type of environment. Of course this is an extreme scenario; yet, aviators never know when they may find themselves forward deployed and working in an environment in which they have never trained.

A motivated ENS Murr; leading the charge for the title of Bull Ensign among the Physiology community.

Editor’s note: The story contained has been left in it’s unedited version. SUSNAP has not validated the arguments contained within and does not endorse flying outside of limitations delineated in OPNAVINST 3710.7U.

Naval Aviation Survival Training Program Technology Update

LCDR Christopher "COOP" Cooper

Director, Human Performance and Training Technology

Overview:

Housed in the remote building 3226, behind the infamous "Malaria Wall" on NAS Pensacola, the Human Performance and Training Technology (HPTT) Directorate leads the development and implementation of new training technologies throughout the Naval Aviation Survival Training Program (NASTP). Responsibilities include investigation and application of new and innovative technologies, development of new aviation physiology and water survival curriculum and training supporting materials, and in-water operational risk management assessment of new, improved and modified survival equipment and procedures. The directorate is currently filled by myself, Dr. Fred Patterson, Mr. Ray Smith and Mr. Thomas Prettyman, combining well over 70 years of knowledge in their respective areas of expertise.

History:

The development and integration of the Reduced Oxygen Breathing Device (ROBD) into NASTP training is what put HPTT on the map. This has been a hugely successful program for the Navy and has taken hypoxia awareness and emergency procedures training to the next level. Nearly every hypoxia related hazard report released by the fleet acknowledges the usefulness of ROBD training. Currently, each Aviation Survival Training Center (ASTC) has 3-4 ROBD trainers that it uses for all TACAIR hypoxia training. Utilizing X-Plane software, we have full 3D cockpits for the FA-18, EA-6B, AV-8B, T-45C, T-6A and T-6B, adding to the realism for the students. Also, ROBD training has been implemented inside the fleet flight simulators by the Aeromedical Safety Officers (AMSOs) at COMSTRKFIGHTWINGPAC, COMVAQWINGPAC, COMSTRKFITWINGLANT, COMTRAWING SIX, 1st, 2nd, 3rd, and 4th MAW. In addition, the U.S. Air Force, U.S. Army and many international armed forces have purchased these devices for their training programs. I receive calls on a monthly basis from foreign services requesting information regarding the ROBD and our NASTP.

Future:

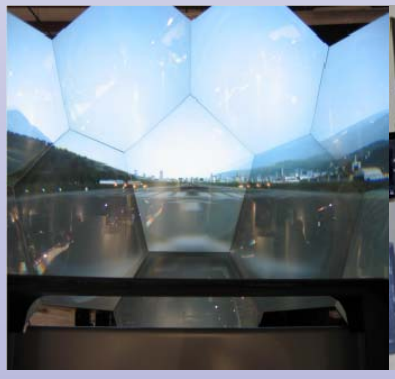
What is next? Building upon the success of the ROBD, we are developing a training device using similar technology for multi-place aircraft aircrew. Hypoxia tents have been used for years by runners, cyclists and triathletes. These enclosures have the capability to create a normobaric environment with an equivalent altitude up to 30,000 feet while completely removing the risks associated with a hypobaric environment such as barotrauma and decompression sickness. By placing configurable flight stations representing the Navy/Marine Corps multiplace aircraft inside the enclosure, we will be able to create the same high fidelity training scenarios currently enjoyed by TACAIR pilots and aircrew while significantly increasing the safety compared to the Low Pressure Chamber. ASTC Miramar is currently being outfitted with the first hypoxia room and HPTT is scheduled to receive their room for evaluation and continued development in January 2012.

Hypoxic Hypoxia Happenings

The next aeromedical threat being addressed is spatial disorientation. HPTT will be receiving and evaluating three different visual displays this fall to be used in conjunction with the new customizable cockpit. The cockpit will have configurable oxygen panels, hot-swappable flight controls, and a touchscreen heads-down display. With the turn of a few screws, the FA-18 can become a H-60! The trainer will come with an Instructor Operating Station that is fully integrated with the ROBD. The station will control the training scenarios from a touchscreen display as well as provide instant feedback of physiological factors to the instructor and the student. The DS4 flight simulation software will be a major upgrade from X-Plane, as it is the same software used in the fleet simulators. The initial purchase that will outfit each ASTC with at least one unit will take place in FY12.

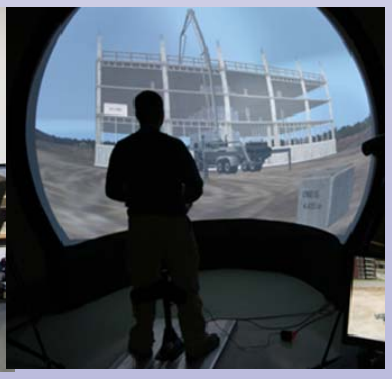
With the assistance of Dr. Fred Patterson, we have developed test plans to evaluate the rate of success recreating various spatial disorientation scenarios with several visual display systems. The first display is from Bugeye Technologies and is called the Virtual Mosaic Display (VMD) visual system. This visual display system is capable of presenting the pilot with a high-resolution, collimated, immersive virtual image throughout a full field of view. The second system is a consolidated effort between many companies with Man Flight Simulator (MFS) at the helm. This display is made of three vertically mounted LCD screens and will provide a 100x50 degree field of view (FOV) to provide an immersive experience for the student sitting in the seat. The last display is a rear projection based display. While lacking in resolution compared to the others, it will provide up to 180 degrees horizontal FOV. Once the evaluation is completed and a visual system is selected, a hands-on, scenario based curriculum will be developed to compliment the new Sensory Physiology curriculum being rolled out to the ASTCs.

With the speed of technology development and an open-minded vision of the future, HPTT Directors will have many high tech systems (i.e. virtual reality, galvanic stimulation) that already show a lot of promise to evaluate and continue to take NASTP training to a higher level. Annual attendance to the Interservice/ Industry Training, Simulation & Education Conference allows continuous insight into the applied and industrial research and contact with businesses involved with new simulation hardware and software. As the “NSTI action officer” for the Trainer Management Team (TMT), the HPTT Director works closely with PMA-205 and makes recommendations for the future of the NASTP. Current TMT action items that will involve HPTT include a new hoist/parachute trainer with the first article being delivered in 2012, upgrades to the Virtual Reality Parachute Descent Trainer, and the next generation portable hypoxia device based on molecular sieve technology. The job is as big or as small as the Director can imagine. I look forward to the day when the fleet is training on all these devices at the ASTC and the next Director is making his or her own visions of NASTP’s future come to fruition.



Bugeye VMD

MFS Display



Projection Display

Writing Good FITREPS

CDR Mike "CHOW" Prevost

Director, ASTC Miramar

Promotion boards do not promote the best officers. They promote the best records. The most important part of your record is your FITREPs. You can be a great officer, but if your FITREPs are poorly written, you will not get promoted (Ask me how I know this.). A few short paragraphs, hardly enough to fill one page, can determine the course of your career. Writing good FITREPs is difficult, and especially difficult is writing your own. I have looked at probably 200 or more FITREPs and have drafted and chopped at least 50. Even with that experience, I am not comfortable writing my own FITREPS. I will always get some help, and you should too. You already know all of the obvious things like getting an EP in a summary group is good, soft breakouts are a must for 1 of 1 FITREPs, 1 of 1 FITREPs should always be an EP, and avoid excessive jargon. Even if you do all of that, there are some mistakes that can keep your FITREPs from having the impact that you want. Below are some of the common mistakes I have seen over the years, along with some suggestions.

Not telling a compelling story. This is **THE** most important thing to achieve. Every FITREP should tell a story about you as an officer. Before you write down any bullets, you should figure out what that story is. For example, perhaps the story is that you were hand selected among the best for some special billet, or that you hit the ground running, really impressed the boss and were given more responsibility than he had planned due to your stellar performance. Can you figure out how to make your FITREP say that in a crystal clear manner? If so, you have a winner. Maybe you were selected for DUINS because you are considered a rising star in the community. Perhaps you were given an ASTC because you are recognized as a good leader who needs little supervision. Maybe you were hand selected among a pool of dozens of excellent candidates, by a rigorous screening and interview process for one of only two available lateral transfer quotas. You should figure out what your storyline is, make it compelling, and support it with clear FITREP bullets and statements by your reporting senior. The FITREP should clearly build the story. If the pharmacist or physical therapist cannot pick up on your story after reading your FITREP the first time, it will probably, at best, be neutral and not really help you get promoted. Take advantage of opportunities as they arise. For example, selected for DUINS (rising star, being groomed for bigger things), selected for MAWTS/NSAWC (selected for top warfighter schoolhouses, only the best and brightest are chosen), ASTC Director (hand picked for remote leadership assignment), PMA 205 (hand picked for the community's most critical money management billet). A series of unrelated cause and effect bullets with an opening and closing statement does not tell a story and it does not make the board's job any easier. Paint a compelling picture for your briefer and make it easy for the board to select you. Stories move people much more than facts and figures.

Not only should your FITREP build a story, but you whole record should build a story. In some ways, our line counterparts have it easier than we do. Their promotion paths are often much clearer. For example, if you are an aviator and you pick up squadron AMO and then OPSO, you have it made. You will probably get XO and then CO. For a diverse corps like the MSC, there is no clear path that sets you apart. You have to build that path and sell it to the board by building a story across several FITREPs. A good story might be something like, "Hand selected for one of only X available slots because he was the best available. He hit the ground running and impressed early. He was given the hardest jobs and was put on the fast track for CAPT." If you can build a compelling story across 5-6 FITREPs, and build that story clearly, how can you not get promoted?

Too much emphasis on quantified bullets. The most common FITREP advice is to try to quantify your achievements and show cause and effect. If this is the sole focus of your FITREP, you may end up selling yourself short. Never forget that you are writing for a MSC board, and the board members probably have no idea what you do. In many cases, numbers will not mean anything to the board. For example, "Provided 35 briefs to over 350 personnel, improving MAG aeromedical readiness and safety." I don't know if that is good or bad. Maybe the last guy gave 60 briefs to 600 people. This "quantified" bullet is mostly a waste and does not really do anything for you. It is simply a white space filler. Even worse would be, "Submitted 5 IMP action chits, resulting in the modification of 4 different ALSS items." A pharmacist or a physical therapist will not know what that means. Even if they know what an IMP action chit is, will they be impressed by 5 of them? I doubt it. How about 10 of them? 15? Probably not, because they will have no idea if 15 is impressive or mediocre. However, some quantified bullets are good like, "Effectively managed a $10 million budget, delivering exceptional value, on time, on budget." The difference in this bullet from the previous bullets is that $10 million is a lot of money from anybody's perspective (even the pharmacist and physical therapist). Consider your quantified bullets carefully and figure out how to make them have an impact, or don't use them.

Forgetting whose words are on the FITREP. Never forget that the FITREP is supposed to be the words of your reporting senior. The board is very interested in what your reporting senior thinks of you. Don't make them guess or try to read between the lines, tell them clearly and directly. If you think they will just figure it out based on a series of quantified cause and effect bullets, you are wrong. Clear, simple statements about you as an officer from your reporting senior can have an even greater impact than cause and effect bullets. Consider some of the following:

> A proactive, hard working officer who makes good decisions. My best staff officer.
>
> An energetic self starter who hit the ground running. I've continued to give him more responsibility and he has performed flawlessly.
>
> A front of the pack performer. #1 out of 15 LTs.

Many times I have heard officers (sometimes reporting seniors) say something along the lines of, "the board will figure out....or the board will recognize.....the board will understand....etc." Never assume that the board will figure out anything. If you have something to say, say it clearly. Hit them over the head with it. If you got an MP because you are the newest member of the summary group but were performing at the EP level, say it. If you got an EP in a summary group on the first shot because you are simply that exceptional, that should be said plainly. The board might not recognize either of those situations (or any other situation). Don't make them figure things out on their own.

Forgetting who the FITREP is written for. The FITREP is not written for your reporting senior and certainly not for you. It is written for your briefer and for the board (specifically, a diverse MSC board). The board has a tough job. All of the records seem to represent good officers and it is hard to rack and stack them. Don't make the board's job harder than it has to be. A series of nice statements about you from your reporting senior, just to make you feel good, may have little impact. Again, the FITREP is written for your briefer, the pharmacist and the physical therapist.

The bottom line is that the board is made up of people like you and I, who are doing the best they can to rack and stack all of the records from top to bottom with very little information, in a short amount of time. It is a tough job. Don't make it harder on them than it has to be. Tell a compelling story. Say it clearly. Ensure that the pharmacist and physical therapist will understand your story the first time they read it. Every bullet should support your story. Your reporting senior should leave nothing to be assumed and should speak clearly about his assessment of you as an officer. Finally, DO NOT write your FITREPs all on your own. Get some help! Find some mentors both in and outside of this community and get their chop. Every time I have had others chop my FITREP, the final product was always better. Don't just assume that good performance and a good community reputation will get you selected. Your record gets you selected. Don't be a stellar officer with a mediocre record!

Additional comments from CAPT Bill Davis:

“There are a few others points that I have held to over the years.

1. Never state something quantifiable in a FITREP unless you can back it up with documentation, i.e. don't lie, falsify or fabricate. That includes training numbers, money, or soft break outs.

2. Write several drafts of block 41 until it fits in the space. Once it fits, start chopping out excess words and build in some white space.

3. Big (fancy) words can be dangerous. If I was a recorder and had to pull out a dictionary to interpret block 41, it would probably piss me off and my pissed off-ness could bleed through the 30-60 second brief in front of the board.

4. As a JO, I always tried to incorporate a bullet about my "active" involvement with the local MSC association to show that I was part of the MSC team.

5. Knowing that our AMSO jobs are out of the MSC mindset, I always tried to put a spin on bridging the gap between Fleet and Navy Medicine or being a front line supporter of the Fleet. Today, this is almost imperative with the rest of our MSC Officer Corps being heavily involved in OIF & OEF.

Hope this helps.”

A Better Aerospace Physiologist

LCDR Mike "CHUNKY" Kavanaugh

AMSO, RAF Centre of Aviation Medicine

"Life is about Passion"

"To fully grasp and bite into the very marrow of your life", you need to get passionate about all aspects to include your career. In the first ten years of my career, I had been loosely associated with and not passionate about AsMA, AsPS and SUSNAP. It wasn't that I was necessarily wrong, but rather that I now see the value of camaraderie, professional reward and opportunity present in these organizations. It was due to the prompting of several officers to include Air Force LtCol Lance Annicelli, who all showed me and inspired me to get **passionate** about our community for many reasons. So, get excited and get involved! The Aerospace Medical Association (AsMA), the AsMA subspecialty society, the Aerospace Physiology Society (AsPS) and the Society for US Naval Aerospace Physiology (SUSNAP) memberships are Win-Win for you.

"Why should I join AsMA, AsPS and SUSNAP...? Chunky, listen.... Navy, Joint Program Military Education (USAF, Command and Staff College) as well as other official coursework, specializations and qualifications are much more important for my career", as stated to me by so many colleagues of mine. The senior leadership in both the Air Force and Navy will tell you that yes, there are several career milestones that are necessary, and I agree. "*So will my active participation in these organizations also help me get promoted?* Most definitely, these organizations can have a positive effect on your chances of getting promoted.

"*Excited about flying and working with aircrew? Of course!"* We're all enthusiastic about flying and doing our jobs in the form of teaching LASERs, NVGs, ALSS gear etc... to the warriors of VFA, VR, HMH, VMGR squadrons and the list goes on. But remember you also need to share your knowledge and help grow your community.

"Make you a better Aerospace Physiologist....? Yes, absolutely." (Aerospace Physiologist and Commanding Officer, Captain Rich Jehue, USN) Active membership in AsMA, AsPS, SUSNAP and the AP certification process will increase your knowledge and teach you things you thought you knew. AP Certification will also give you a USN BUPERS Subspecialty Code (1836K) or a USAF Personnel Certification Code. Association with International Aeromedical Experts and their parent organizations will broaden your knowledge, create liaisons and open career opportunities to you. Approximately 25% of the AsMA membership is international.

"*Open doors and broaden horizons....? Yes."* An important facet of your profession is to publish professional articles, give presentations to professional organizations and / or be a committee member that organizes panels with AsMA, SUSNAP and of course with the FAILSAFE Conference. With AsMA you can become a presenter on a number of professional panels such as the Aerospace Physiology Education / Training Panel or any number of the other operational Aerospace Medicine panels for the AsMA conference each year. At AsMA both this year and last year several Navy and Air Force Physiologists gave presentations within these panels, as well as worked as organizing committee members. This is rewarding and, frankly, fun. LT Cheryl Griswold, for example, was published May 2009 in the AsMA Journal, Aviation, Space and Environmental Medicine Journal. The process of publishing and presenting your work before your peers or organizing professional panels "*Will make you a better Aerospace Physiologist".*

"Give you a greater chance for promotion and career advancement....? Yes." As advice to fellow Aerospace Physiology professionals, especially to USAF Captains / Majors and USN Lieutenants / Lieutenant Commanders, your membership will have a holistic affect on your professional career. It's not just the AsMA certification subspecialty/personnel code recognized by USAF and USN that will benefit you.

The knowledge garnered, association with professional organizations, and publication of your work in the AsMA journal (through your efforts) as well as association with international experts on our field that can increase your chance of promotion. CDR Artino and CDR Folga, two exemplary Officers, have truly made the most of these professional organizations in every aspect to include their contributions to our aerospace physiology community as well as international organizations.

As you know, the NPC Promotion Selection Boards each year are given a Navy wide Selection Precept and a Corps specific Precept (Sec Nav Promotion Guidance Order). From the 2012 Medical Service Corps Specific Precept: ORDER CONVENING THE FY 2012 PROMOTION SELECTION BOARD TO CONSIDER MEDICAL SERVICE CORPS OFFICERS ON THE ACTIVE DUTY LIST OF THE NAVY FOR PROMOTION TO THE PERMANENT GRADE OF COMMANDER in the body of the precept under the headings: C. Additional Considerations, (2) Education and Professional Development it reads as follows:

(a.) Obtaining and applying advanced education in specialized competencies that result in designation as a Proven Subspecialist or award of Additional Qualification Designation (AQD) codes are significant career achievements.

"*Will you reap career benefits? Yes."* A few months of dedicated study of our profession's fields of expertise and a score of 70% will garner you this subspecialty code and the advantage of greater professional knowledge. The subspecialty code is: 1836K, which is also designated by: CAsP (Certified Aerospace Physiologist) attached to your name as a specialization title. Yes, other operational communities such as Physicians, Optometrists, Physical Therapists and HCAs have a more recognized certification and recertification process accompanied by a CME or CE point system (Aerospace Physiology Certification through AsMA is working towards this). Five of this year's Commander selects are AsMA Certified Aerospace Physiologists. Is your Certification as important as documenting **Leadership** on your FITREP in Block 41, as well as earning a *soft break out* or competitively ranked MP or EP in Blocks 42-45? Of course, not. Is it as important as JPME Phase I? Most likely, not. Is it as important as the Executive Medicine AQD? Possibly. So does it matter? I say, yes, for several reasons listed in this article. I will also tell you that at the very least, it could matter on your.... promotion board if you're in Crunch Zone. Overall for your career will the certification and involvement in AsMA help you get promoted? Several more senior Officers, all smarter than me, will say yes, because: "*It will make you a better Aerospace Physiologist.*"

"Our Program Leaders made a difference. Their pro-activity and dedication to excellence in many arenas including involvement in professional organizations has championed our community's strength and credibility over the years." Hard work from some of the senior leaders in the recent past, such as retired Captains Musashe, Patee, and Eichner, as well as several other currently active duty OICs, XOs, COs and Specialty Leaders have made our Aerospace Physiology community the program that so many other MSC Corps communities emulate for our robust structure of mentorship to our officers. Specifically their leadership in the arena of professional involvement should inspire you to become more active with your Aerospace Medicine Community at large. Share this passion with your community of Aerospace Medicine experts.

Can you make a difference? We all know JFK's immortal words. *"Ask not what your country can do for you, ask what you can do for your country."* In the light of these profound words I would sincerely state that it really is our responsibility to contribute to our professional community. You can make a quantifiable impact on our professional community through AsPS, AsMA and SUSNAP. You can and need to help with the growth of our newer Aerospace Physiologists through these professional organizations. You can and we all need to contribute to the growth of our community and the future viability/survival. Our involvement can and will help to grow our community's strength, credibility and enhance the promotion chances for our younger officers. *Ask what you can do for your Aerospace Physiology community.*

Enrich your life, your career and have fun....? Of course. You will meet fellow professionals and make lifelong friendships. In many aspects you will reap the benefits of your career by what you put into your career. It's frankly that simple. It is now I see the **Win-Win** side of getting actively involved with AsMA, AsPS and SUSNAP.

Carpe Diem, friends, "Seize the Day", and get passionate about your career's communities: AsMA, AsPS and SUSNAP. It's a win - win proposition. Get involved and be passionate!

Advancements

O-4 Promotions

Tom Jones
Angela Baker
David McEttrick
Johnathan Swiger

O-5 Promotions

Alfred Bransdorfer
Richard Folga
Paul Hauerstein
Leslie Kindling
James Linderman
Meredith Yeager

Reserves
Kelly Johnson

O-4 Selections

Heath Clifford
Austin Latour
Kimberly Maryman
Amy Hendrix
Daniel Immeker
John Cooke

O-5 Selections

Michael Kavanaugh
James Balcius
Amber Biles
Brian Bohrer
Nick DiMaso
Ellis Gayles
Robert Higgins
Sean Lando
David Peterson

Reserves
Dave Buzzetti

Awards

Outstanding Civilian Award	Mr. Richard MacCrone
James Janousek Junior Enlisted Award	HM1 Brandon McMahan
Robert Graham Senior Enlisted Award	HM1 Shane Prybylski
Special Recognition Award	CAPT Keith Syring
	CDR Joe Essex
Oustanding Naval Aerospace Physiologist Award	LT Kim Maryman
The Wiley Post Award	LT Kim Maryman
The Paul Bert Award	LCDR Tyson Brunstetter
Aerospace Physiology Society's "President's Award"	LCDR(ret) Brian Swan

Board Certifications

LT Heath Clifford

LT Tim Welsh

LCDR Mike Kavanaugh

LCDR Nick DiMaso

Snapshots

CDR Joe Essex's Retirement

LT Tim Welsh being drug 1 foot for every minute spent sleeping on the job. Needless to say, the truck ran out of gas.

LT John Cooke (Dual Designated) Sometimes captions aren't needed when the picture already says everything.