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Letter From the President

By LCDR Debra Yniguez

SUSNAP President

Hello and Welcome to our May 2008 SUSNAP Journal!! It's an exciting time to be a Naval Aerospace Physiologist!! As most of you know we are involved in many activities including research, development, training and safety!! As a Naval Aerospace Physiologist you probably wake up every morning knowing that you have the best job in the Navy!

The new SUSNAP board would like to say thank you to last year's SUSNAP Board (LCDR "Littel", LCDR Biles, LT McCarthy, and CDR(ret) Clark for all their hard work! Special thanks to LCDR Balcius for all the time and energy he devoted to publishing the 2007 Journals!

This year's SUSNAP board has big shoes to fill and we've already started a few new projects. Our Historian, LT Tiffany Landis, is working diligently with CDR(ret) Bill Little and CDR(ret) John F. Greear to ensure that "our" history is "electronically" saved for our records. They will be electronically transferring the Physiologists' Scroll. We will post these items when we get the new SUSNAP website up and running via LT Tom Jones who has volunteered to get this project rolling.

The SUSNAP organization hosted this year's Navy Luncheon during AsMA in Boston on 12 May 08. We were well represented by the large number of Naval Aerospace Physiologist in attendance. In addition CAPT Vince Musashe was chosen by SUSNAP as this year's Navy Luncheon guest speaker and he inspired everyone in the room with his brief "Navigating the Chaotic Waters of Transformation." Thank you Capt Musashe for the informative and motivational brief!

This issue is filled with articles from Physiologists around the globe doing great work in their current

billets. In addition to the usual articles that SUSNAP publishes, we have added a few more areas of interests, which we hope you all enjoy!

We'd like everyone to be familiar with the future of our program so we've included two new sections: "Meet the SNAPs" and "Interview with an Intern," hopefully this will give you a name with a face and a little more information about the new individuals you will see around the community! Take some time to read these sections and get to know them.

Since we're saying hello and welcoming the new Physiologists, someone gave me an idea about finding out what the retired folks are up to. So, we've added "Where are they now?" We will focus on one or two of these individuals per journal to give our readers insight into the retired life that awaits us and maybe even give us a few ideas on what to focus on as we get closer to retirement.

Hopefully, you will enjoy this issue and accept the personal flare we'd like to spin on this journal. Let us know what you think; we are always open for new and interesting ideas.

Enjoy your reading!



Message From the Chief Editor

By LT Tim Welsh

Intern ASTC PAX River



As the new Chief Editor of the SUSNAP Journal I would like to introduce myself and detail my vision for the journal over the next year. First, I would like to thank the Society for trusting me with this important responsibility that serves as a key communication tool among our entire community.

Born in Ambridge PA next to the Ohio River a stone throw away from the heart of Pittsburgh steel country, I attended Slippery Rock State University earning a BS in Exercise Science (1997) and a MS in Exercise Physiology (2000). After earning my MS and prior to joining the military, I worked as college instructor teaching anatomy & physiology, human biology, and nutrition. Also during this time, I worked part-time as a strength and conditioning coach and personal trainer. In 2002, I decided to join the Army to gain more research experience as a Biological Research Assistant. After short tours at FT Benning Georgia, FT Sam Houston Texas, and Tripler Medical Center Hawaii, I spent 2.5 years at the United States Army Research Institute of Environmental Medicine (USARIEM) located in Natick Massachusetts. While at USARIEM, I had tremendous opportunities to conduct, present and publish human performance research. Even though the USARIEM research experience was one of the most challenging and gratifying experiences of my life, I felt

my skill set would better serve the NAPP. I received a conditional release from the Army and started my SNAP training in November 2005. After being winged in May of 2006, I was sent to ASTC PAX River and this June will take over as the Training Wing 6 AMSO .

I see the SUSNAP Journal as not only a way to disseminate technical information, but also a way to network with fellow physiologists, whether that it is in a professional manor or on a personal level. I have reviewed many of the past SUSNAP journals all the way back to the first SUSNAP Journal released in April 2000. Within these issues I see a good mix of technical information, humor, and professional development. I plan to continue the journal in that direction and I would like to invite you to help me do the same.

With our community spread out all over the world and performing so many unique and interesting jobs, the SUSNAP journal is one of the best ways we can all maintain NAPP situational awareness.

If you would like to submit an article please forward it to timothy.welsh@med.navy.mil. Instructions for authors are located in the SUSNAP Notes section in this journal.



My First F-18 Ride

By LTJG Christian Rathke

Intern ASTC Pensacola

This past June, I had an experience of a lifetime. Lemoore California was my first exposure to aviation and physiology outside of Pensacola where I'm currently in the early stages of my internship. The first day was spent getting spun up on my AGSM during CFET training with two impressively and personable people (LCDR Kavanaugh & LT Turcotte). The following day was my first FA 18 1-V-1 basic combat maneuver flight (very cool). My pilot, CDR Vanburen, was a former F14 Top Gun instructor and F15 pilot. Our role in the dog fight was that of a simulated MIG (bad guy). We pulled 7.5 G's multiple times and to my surprise found it to be much easier than the centrifuge. At the end of pulling G's for two days I was physically exhausted and mentally stoked. The experience has given me a greater appreciation of the many demands placed on pilots and the critical role physiologists play in equipping pilots to meet those demands. What an incredible experience.

“The experience has given me a greater appreciation of the many demands placed on pilots”



Meet the SNAP

By LTJG Luke Quebedeaux

New SNAP



LTJG Quebedeaux, a native of Marksville, Louisiana, was born on 09 July 1983. He graduated from Louisiana Tech University with a Bachelor of Science in Kinesiology in August 2005, and acquired a Master's of Science in Kinesiology with an emphasis in Exercise Physiology from Texas Christian University in August 2007. LTJG Quebedeaux underwent direct commission into the United States Navy on 12 July 2007 as a member of the Medical Service Corps.

As of 20 August 2007, LTJG Quebedeaux attended Officer Development School in Newport, Rhode Island. He is currently undergoing training as a Student Naval Aerospace Physiologist at Naval Air Station Pensacola. Upon designation as a Naval Aerospace Physiologist, he will report to the Aviation Survival Training Center at Marine Corps Air Station Cherry Point on two year orders.



NEW JAX Intern

By LT Evan Sleipness

JAX Intern

LT Evan Sleipness comes from Washington State. He received a Bachelor's degree in biology from Whitman College, and earned his Ph.D. in neuroscience from Washington State University. After receiving a direct commission to the Navy Medical Service Corps in August 2007, he was sent to Pensacola for training as a Naval Aerospace Physiologist. In June 2008, he will report to Naval Air Station Jacksonville for his two-year internship. Recreationally, LT Sleipness enjoys flying, SCUBA diving, and skiing.

Interview with an Intern

LTJG Bill Baca current Intern

ASTC Jacksonville



SUSNAP: What's your call sign?

Baca: Chewie

SUSNAP: Where were you born, family size?

Baca: Burbank CA, married with four children 14,12, 9 and 3!!

SUSNAP: Why the Navy?

Baca: I started as an enlisted radio OP Specialist for 4 years and had a 15 year break in service. Then I went to school.

SUSNAP: What school did you attend?

Baca: Palmer College of Chiropractic Davenport, Iowa.

SUSNAP: AWESOME!! Besides trying to keep up with four kids, what do you like to do in your "spare" time?

Baca: I'm a Black Belt 1st degree in Judo and Jujitsu.

SUSNAP: How long have you been doing this?

Baca: I started at age 11, I have been competing for most of my life.

SUSNAP: Well we'll remember that!! Any other interests?

Baca: I'm an outstanding Poker Player!

SUSNAP: We'll have to tell Ormonde about this!

Where would you like to go for your next tour?

Baca: I'd like to go to San Diego, CA.

SUSNAP: Good Luck and take a number!! Is there any special training that you'd like to get while being an Intern at ASTC Jacksonville?

Baca: Yes, I'd like to go out on an Aircraft Carrier.

SUSNAP: I'm sure CDR Jay will arrange that, before you leave! Any last words of wisdom?

Baca: Yes, CDR Sue Jay is an incredible mentor, and I love being a Physiologist!

SUSNAP: O.K. you don't have to convince me, we know that!!

LTJG Baca Thank you for your time, Welcome Aboard!! Congrats on promotion to LT 1 June 08!!



SME Program Update - No, It's Not Dead

By LCDR Rich Folga

Human Performance and Training Technologies, NSTI HQ

Human Performance and Training Technologies (HPTT) Directorate, NSTI Code 022, has traditionally managed the nuts and bolts of the SME program in the form of the Navy Medicine Online (NMO) http://navymedicine.med.navy.mil/default.cfm?NASTP_SME_webpage. As published in previous SUSNAP articles, there is a web link that does not require NMO PKI access <http://navymedicine.med.navy.mil/nastpsme/index.cfm?> that links directly to the SME page. The pages are current as of October 2007, which means I post what I have been given. The contact info for each assigned SME (assigned formerly by BUMED or now informally by consensus) is generally as current as the "Phys list" from CAPT Syring.

The latest model for the SME program structure is to follow OPNAVINST 3710.7 Appendix E adjunctive training topic areas. Since the NAPPPC divested the SME program and assigned oversight to NSTI to at least maintain (in our case, create) a solid database of briefs and support materials for each topic area brief as part of it's NASTP Model Manager responsibilities. This currently does not exist for each brief area at each level. We aim to fix that. A few functional areas carry over just fine from the old SME framework (acceleration SME page works for level D-5 GTIP) however most SME pages carry only briefs and docs for reference. An ideal situation is to have updated briefs with slide notes and instructor guides. One way to tackle the workload is to disperse the tasks throughout our talent pool. The latest version of the Naval Aerospace Physiology Program (NAPP) Internship Guide (07 November, 2006) includes a specific task for developing the instructional materials for these topic areas. For example, the following Interns are assigned to develop training topic courseware: Dustin Huber - SJU-4 AAE; Angie Baker - GTIP; Chewie Baca - F-5 AAE; Clark Griswold - GRU-EA7 AAE; Rat Rathke - T-6 AAE. The theme here

is aeromedical aspects of ejection briefs for each seat. It is Level A-1 required annual training so probably a good place to start. For Level A-2 Sensory problems, we will eventually be using excerpts from the Spatial Awareness Training System (SPATS) courseware to satisfy that requirement. I will provide a brief update on SPATS in the following section. In the meantime, feel free to submit any recommended briefs or supporting documents, web pages, etc. that you feel would help modernize the SME website.

SPATS

SDS International (<http://www.atdlink.com/>) is currently under contract with the Navy to produce SPATS courseware to be used for indoctrination of Aeromedical Officers, annual refresher training (Level A) and mishap lessons learned (MLL) products. All courseware will be NKO capable. The SPATS development effort is currently in Phase III of Small Business Innovative Research (SBIR) project, which in plain language means we are buying stuff. An introduction to SPATS was published in the Vol. VI, Issue 3, January 2006 SUSNAP article titled *Human Performance and Training Technology Update*. In addition to the courseware, an ongoing effort to develop a simulation-based product is accompanied with an instructor scenario authoring capability (ISAC) tool to organically generate MLLs in order to keep our courses current and relevant. Both the SPATS courseware modules and the ISAC tool are Dec 2008 deliverables. For a sampling of the SPATS concepts and products, use the above SME link and go to the Spatial Disorientation and Situational Awareness page. You may obtain the password to the protected documents by emailing Richard.Folga@med.navy.mil from a military account. The courseware development effort began with heavy SME inputs from Dr. Fred Patterson (NAP #142) and will be completed with the assistance of Dr. Robert Kennedy. If you have any questions about the SPATS SBIR program, courseware, ISAC tool or any of the above content, please contact LCDR Folga.



Naval Aerospace Physiologists Leading the Way

New Board Certified Aerospace Physiologists

At the recent 2008 Aerospace Medical Association (ASMA) conference, 3 fellow Naval Aerospace Physiologist became Board Certified Aerospace Physiologists (CAsP):



LCDR Debra Yniguez, CAsP:



LCDR Rob Higgins, CAsP:



LCDR Sue Jay, (CAsP):

This Years Members of the Certification Committee

CDR Tom Wheaton **Certification Committee Chairman of the Board**

LCDR Richard Folga **Certification Committee Examination Chairman:**

Brian Swan (LCDR ret) **Certification Committee Member Examination Board:**

Congratulations To All!



Hypoxic Hypoxia Below 10K' MSL

By LT Tim Welsh

ASTC PAX River Intern

Is it possible for aircrew in non-pressurized aircraft to suffer hypoxic hypoxia below 10 K' MSL? Technically, the answer is yes. Independent of other forms of hypoxia (i.e. anemic), the current accepted altitude that an individual may be at risk for hypoxic hypoxia is >10K' MSL (4). Data from a recent survey of Australian Defense Force helicopter aircrew supports the possibility that aircrew may experience hypoxic hypoxia below 10K' MSL (5). In that survey, 47 of 53 aircrew respondents indicated that they experienced or knew others who experienced hypoxic-like symptoms while flying below 10K' MSL. The Australian aircrew reported physical symptoms that included headaches, easy tiring with physical work, mental exhaustion, tingling of fingers, communication difficulty, mental confusion, and impaired vision. In addition to the hypoxia survey statistics, narratives written by aircrew were provided describing specific incidences of possible hypoxic episodes at altitudes below 10K' MSL. In these narratives, there were reports of problems with landing, performing mental calculations,

“47 of 53 aircrew respondents indicated that they experienced or knew others who experienced hypoxic-like symptoms while flying below 10K' MSL.”

reaction time, and slurred speech. The mean altitude range of these narratives was ~8460K' MSL. It is entirely possible many of these reported hypoxia episodes were caused by other compounding factors such as inhalation of carbon monoxide, fatigue, stress, dehydration, heat stress or other physiological stressors, but we can not entirely rule out hypoxic hypoxia.

Interestingly, the incidences of hypoxic symptoms among all of Australian aircrew were not distributed evenly between pilot and non-pilot. One or more symptoms consistent with hypoxia were reported by 86.6% of non-pilot aircrew and 60.9% of pilots. This raises the question why would non-pilot air-

crew have a higher incidence of hypoxic episodes? It has been reported that physical activity at altitudes above ~4K' MSL can cause a significant reduction in blood O2 saturation (SpO2) that is below the expected reduction (2, 3, 6). For example, let's say an individual's SpO2 is 89% at 10K'. If that individual becomes physically active at that altitude, SpO2 may fall to the low 80's. In an operational mission in Afghanistan where the mean altitude is ~4K MSL, helicopter operations may require an aircrew to take-off from 4K' and arrive at a 4K' ridge (total of 8K') with the crew performing light to heavy activity such as door-gunning, loading, unloading, and winching. Combine that altitude with light to heavy physical activity, it is possible that SpO2 may drop into the hypoxic range (<87% SpO2). In addition to the possible hypoxic hypoxia, other environmental factors such as inhalation of carbon monoxide from aircraft exhaust could further reduce SpO2. In this example, it would be very possible that many if not all of the aircrew would be close to becoming or would already be suffering from the effects of hypoxic hypoxic.

A recent study by Smith (6) provided evidence supporting the occurrence of hypoxic hypoxia during periods of light (~30 W) to moderate (~60 W) cycling exercise at altitudes <10K'. The researchers reported that during exercise at altitudes of 7-9K' MSL caused SpO2 to drop 4.3-5.5%. This drop in SpO2 was in addition to the de-saturation that occurred due to altitude exposure. The range of the lowest reported SpO2 was 82-94%. This is a significant finding because in susceptible individuals, the first measurable decrements in cognitive function occur at ~87-89% (1).

Since physical workload can be up to 500 W during duties such as, door gunning, winching, or loading (5), operational necessity may push aircrews to fly close to 10K' and in some cases over 10K' (personal communication with refresher helo students), it may be possible that aircrew are performing essential aircraft duties while hypoxic. Of



the studies that attempted to examine the effects of physical activity at altitudes $\leq 10K'$ on cognitive performance, all were relatively inconclusive. There still remains some controversy concerning what is the lowest SpO₂ level an individual can reach without a significant decline cognitive performance (3). Is the risk of hypoxia in aircrew flying in aircraft near 10K' MSL cabin altitude at such a risk that countermeasures be put in place, beyond the current status quo, to mitigate the hypoxia risk?

Based on the objective studies and the subjective narratives reported in peer reviewed research articles, it appears that hypoxic hypoxia may be a possible risk to pilot and non pilot aircrew during missions above 7K' MSL. Does this mean we should add oxygen systems to helos and/or have our refresher helo aircrews participate in dynamic hypoxia low pressure chamber evolutions? Not necessarily, but the helo aircrew should be aware that: just because they typically fly below 10K' MSL doesn't mean that hypoxic hypoxia is a non-issue in their community.

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Aviation Life Support Systems

Virtual Terrain Board "The Future of Night Vision Training"

By LT Kimberly Oelschlager

MAG-39 AMSO

The MAG-39 Aeromedical Safety Team is actively engaged in a joint evaluation project with the USAF Night Operations Center of Excellence from the Air Force Research Laboratory (AFRL) researching the training effectiveness of a Virtual Terrain Board (VTB) to determine its efficacy as a viable training device for the Night Vision Goggle (NVG) aviation training curriculum. The Virtual Terrain Board (VTB) was installed by the Night Readiness Group at the MAG-39 Night Lab in June 2007 and has had over 700 active participants via the MAG-39 NVG refresher course. The system installed contains three training modules depicting terrain scenarios from locations in Florida, Arizona and Nevada. The

three training modules show the differences in illumination and contrast, shadowing, and the effects of natural vs. artificial lighting on the surrounding terrain features. The scene is a 360 degree shot of either an airfield, TERF route or a large metropolitan area, such as Phoenix, Arizona. The AFRL and the Night



readiness group are working to construct a data base containing the airfield at Camp Pendleton along with many different TERF routes and impact areas.

The concept of operations employed by MAG-39 is to evaluate our Pilots and Aircrew utilizing a survey developed by the AFRL via our NVG Refresher classes. MAG-39 was chosen as one of four sites because our volume of NVG refresher classes is greater because we conduct annual NVG refresher classes for all squadron personnel attached to MAG-39. We are utilizing the instructor guide to provide information concerning deficiencies in the VTB



training scenarios compared to the current physical terrain board utilized in the night lab. Feedback has been provided regarding specific scenarios that required us to use the physical terrain board to provide demonstration support for the required topics.

The idea of the VTB is bringing us into the potential future of Navy-Marine Corps aviation following the tenets of Sea Trial. This system could be utilized along with simulator training as a complete night vision goggle mission rehearsal system. The result of this type of scenario based training would greatly enhance the Aircrew's overall situational awareness and competency giving us an edge in the battle against human error as a causal factor in night related aviation mishaps. Since it is very young in its development the concept of fly through technology would greatly enhance the training provided by the VTB. Additional, considerations to increase the quality of training would be to build a variety of data bases containing all the specific routes flown by squadron aircraft either INCONUS or OCONUS. This would benefit the Aircrew by allowing the further development of familiar cueing of terrain features associated with the specific TERF route under the illumination conditions of the mission prior to launching of the aircraft.

This past September MAG-39 DOSS, AFRL, Nite Readiness and Skypix utilized a UAV at Camp Pendleton taking real time pictures and video of our operational ranges and landing zones in an effort to build a Camp Pendleton database for the VTB. As of January 2008 the Camp Pendleton database will be installed and fully functional with the anticipation of its incorporation into the NVG Refresher curriculum especially targeting the post-deployment personnel from the standpoint of "back in the saddle training." Also, we will have the Camp Pen-

leton database copied in the "simulated" load for the flying squadrons to possibly utilize as part of their night systems instruction potentially gaining heavy usage at our training squadrons. Other expected updates for the VTB will be the addition of obscurations and ordnance depicting their effects on the performance of the goggles. Recommendations by the Aircrew from MAG-39 via the surveys supplied from the AFRL include the addition of "fly-through" capabilities coupled with changing environmental variables throughout the course of a mission profile. The only drawback the virtual terrain board presents visually is the lack of depth perception which was picked up while having the students compare both the physical and virtual terrain boards. MAG-39 DOSS shop believes we can use both as effective training devices in an effort to increase the Aircrew's situational awareness in the night environment.

As our concept of operations continues to evolve we have incorporated the use of the VTB to enforce the terrain features found in two rotary wing NVG related mishaps. The data base contains the type of terrain features and illumination levels depicted with the mishaps



that resulted in loss of situational awareness and degraded visibility because of the flight conditions. We heavily emphasize the need to always use their on-board sensors to validate all perceptions especially those derived from degraded visual conditions. Eventually, incorporation of FLIR technology with the Vir-

tual Terrain Board would provide tremendous training for our FLIR equipped AH-1 and UH-1 platforms.



Hottest ALSS Topic in USMC Rotary Aviation

By LT Kimberly (Cutter) Oelschlager

MAG-39 AMSO

The hottest ALSS topic in USMC aviation is “body armor”. Since the concept of the “single integrated vest design” started in 2003 with a point paper to NAVAIR by then MAG-39 AMSO LCDR Jim Balcius tremendous progress has been made on the design over the last 5 years culminating with the final prototype projected for early Spring 2008. The initial design started with IRAC 22 (Figure 1-1 and 1-2) in 2006 that was an O-level project calling for



Figure 1-1 (IRAC 22/25)



Figure 1-2 (IRAC 22/25)

the modification of the PRU-60A soft armor fitted into outer vest casings secured with Velcro on both sides. Across the front of the vest is Type-17 webbing allowing for the attachment of survival items in addition to the creating of inside pockets for the placement of the PRU-61 or ESAPI hard armor. Since its inception in 2006, MAG-39 has submitted double digit In-service Management Panel (IMP) chits along with additional pressure applied by LCDR Ellis Gayles forward deployed to Iraq in 2006 resulting in the following changes to the IRAC 22 design and use of the Desert Warfare Configuration:

- a. Modification of PRU-60A soft body armor to eliminate the interference in neck and throat area and elimination of excess bulk in shoulder areas...can be used for the hard to fit female / male torso...listed as IRAC 25 incorporated as a change to manual 13-1-6.7-4 paragraph 3-114A.
- b. The PRU-60A soft armor and PRU-61 hard armor will be available in 4 sizes to assist in the fitting of personnel outside the 95% size range.
- c. Side enclosures attached from the back carrier over the front carrier with a securing strap fastened on either side on the front using a snap fastener.
- d. Look at Table 3-3 Land Based Desert Configuration and Table 3-4 Armor Modification and Desert Warfare Configuration. This in-



forms you as to what is carried on the vest. (IRAC 28 Changes the name of this vest)

- e. Read the 13-1-6.7-4 manual paragraph 3-15 regarding the wear of the Desert Warfare Configuration overland only provided there are not any over water flights or cyclic shipboard operations. This has allowed rotary squadrons to continue the “train like we fight mentality” following Desert Talon to their scheduled deployment.
- f. Outer casings made of either a heavy cordovan or curihee material as opposed to the current Nomex material that last for one 6 month deployment requiring repair by the FE shops. (More man-hours and money)
- g. Universal Camouflage color in ALSS gear. The Aviation green provides a great contrast in the desert for a sniper so there is a need to have a color for ALSS gear that matches the operating environment.
- 1. IRAC 28 calling for the addition of the LPU-34 to the USN/USMC Armored Survival Vest with an added provision that a water rescue will require the strop since there is not a D-ring attached to the vest. In Iraq the rotary squadrons are not hoist capable because of the danger of sniper fire.

MAG-39 squadron Flight Equipment (FE) shops have produced a total of 640 vests constructed either in house or out in town using an outside vendor that was approved by Navair via an Interim Flight Clearance. Since MAG-39 is the largest deploying USMC rotary MAG supplying squadron detachments for 4 MEU’s and 2 squadrons to Iraq every 6-7 months. As a result the Pilots / Aircrew have supplied tremendous feedback over the last 2 years regarding the single integrated body armor configuration. The result of this feedback is the final product design pictured in Figure 2-1, 2-2 and 2-3 that is waiting for a bid to be placed on contract.



Figure 2-1



Figure 2-2



Figure 2-3

Hopefully, enough pressure can be applied to PMA-202 to get these outer casings in the supply system starting FY 09. The amount of man hours on a Flight Equipment shop to produce and maintain these vests averaged out to be 5.5 hours along with their required other jobs such as maintenance of the CSEL radio. That is a lot of tasking placed upon operational squadrons.



What is it that the Marines want in body armor?

The biggest need is for the armor to be modular and configurable in design to allow the Aircrew to change configurations based on their Area of Operations (AOR). Another need is the design should decrease bulk and weight affording the Aircrew increased mission endurance and ease of mobility for all mission tasking while not sacrificing ballistic and fragmentation protection. If the need for over land / over water egress should occur then applicable flotation and ease of hard armor plate divestment is a concern so they can run or swim to evade the enemy and have confidence all their gear will work as advertised.

Other concerns: the body armor configuration must meet NAVAIR guidelines concerning ballistic protection, flammability, compatibility with the different T/M/S rotary platforms, and compatibility with the CBR gear ensemble (a.k.a. JPACE/JSAM). Additional, compatibility concerns are with future cooling systems such as the Air Warrior Cooling system that is currently being looked at in the CH-53 community and/or phase change cooling system.

Throwing a wrench into the convoluted minds of the Aviation Life Support System (ALSS) world, the clothing team has embarked into the realm of body armor with a re-design of the single integrated armor vest concept from the ground up. Wendy Todd from the clothing team visited MAG-39 in the Fall 2007 to work with the Aircrew and Flight Equipment personnel in a focus group setting soliciting information concerning the current system configuration. The MAG-39 Aeromedical Team will keep everyone updated as the clothing team progresses on their design of the single integrated body armor vest concept.

It was the spirit and intent of this article to update and educate interested parties on the status of the single integrated body armor concept affecting USMC rotary and soon the USN rotary communities. The goal of MAG-39 is to provide enough information to NAVAIR PMA-202 Dick O'rourke and Wendy Todd as to the needs and desires USMC rotary. The Marines desire a modular integrated

body armor system that is easily configurable to their specific theater of operations. The design should afford the proper ballistic and flammability protection allowing the Aircrew effective mobility and increasing their endurance without sacrificing mission effectiveness. We realize that there is not a perfect solution to the body armor situation but the concept of development is to minimize the little things to increase effectiveness of the gear and get the best possible workable configuration to the Aircrew.



IRAC 36: From the Drawing Board to the Fleet



By LT Heath "Red Dog" Clifford MAG-29 AMSO

and

HM1 Jason Verneir MAG-29 AMC

A true team effort was demonstrated by LCDR Lee Anne Vitaoe and her staff, lead by Mark Mergard at NAVAIR in the quick response to a potentially deadly situation involving the LPU-32/P, passenger flotation device. According to MNF-W flight operations and in accordance to the OPNAV3710T, combat troops involved in over-water flight shall wear passenger flotation. However, the problem faced by these troops was the improper fit of the LPU/32P. While wearing their OTV/MTV vests and associated battle gear, the length of the waist belt did not allow the troops to make the connection around the waist. If waist belt extensions were simply added, a secondary problem of not being able to shed the body armor after emergency egress could not be performed due to interference from the waist belt strap. In order to reduce the snag hazard from a dangling waist strap, a decision was made by 1 MEF to instruct troops to wear the LPU-32P underneath the OVT/MVT. NAVAIR inflatable subject matter expert Mr. Mergard and his team quickly identified a design solution by adding a 12" adjustable vertical strap that would allow the waist strap to fasten below the OTV/MTV and also allow unobstructed doffing of the vest as well. NSTI's tests and evaluation team led by Mr. Ray Smith give it the thumbs up after rigorous testing and IRAC 36 was subsequently issued to the fleet by NAVAIR. However, to cover the immediate needs for operational troops in Iraq, LCDR Vitaoe and her staff, spent countless hours making over 1000 modification kits and sent directly to LT Heath Clifford, MAG-29 (REIN) AMSO for distribution to squadrons F/Es for immediate O-level implementation. The following safety brochure was put together by HM1 Jason Vernier and LT Heath Clifford referencing the previous safety passenger safety brochure by LCDR Ellis Gayles.

LPU-32/P (IRAC 36) LIFE PRESERVER



The LPU-32/P Life Preserver Assembly is authorized for use by passengers and troops in helicopter or transport type aircraft for emergency water survival situations. It is designed such that one size fits all.

The LPU-32/P consists of a Life Preserver Yoke assembly and a survival pouch with following survival items: sea-dye marker, whistle, & ChemLite. The LPU-32/P weighs approx. 4 pounds and provides a minimum of 40 pounds of buoyancy. It consists of a floatation assembly, two inflators, and a casing cover assembly, which includes the belt assembly, vertical adjustment strap, and the survival items pouch. Donning or doffing does not require the removal of personal effects such as helmets or eyeglasses.

DONNING PROCEDURE

1. The LPU-32/P shall be worn as the outermost layer of clothing and/or over the armor/tactical vest.
2. Unzip the LPU-32/P and place over head.



3. Adjust the vertical adjustment strap so that is below the armor/tactical vest if worn. Fasten plastic buckle and adjust waist strap belt. For passengers not wearing the OTV or MTV the vertical adjustment strap should be adjusted so the waist belt sits at the waist. Zip up all the way.



4. Wear the LPU-32/P over the armor/tactical vest as shown.



5. When embarked on a helicopter, buckle seat belts and visually identify emergency aircraft exit hatches, windows, and doors.



PASSENGER BRIEF GUIDE

1. SEATBELTS. Passengers will be seated with seatbelts on/buckled from take-off to landing.



2. EMERGENCY PROCEDURES. Remain seated, and follow all of the directions and instructions from the aircrew. REMAIN CALM, DO NOT PANIC.

3. CONTROLLED DITCHING. Follow directions from the Aircrew. Brace for impact and remain seated until directed to egress the aircraft.

4. UNCONTROLLED DITCHING. Follow directions from the Aircrew. Hold a reference point and orient yourself towards closest aircraft exit. Place your free hand on your seat restraint release, but do not release restraint. When all violent motion stops, and while maintaining reference point, release seat restraint.

EGRESS

1. Follow all directions from Aircraft Aircrew.

2. Grab a reference point and orient yourself towards closest aircraft exit.

3. When all violent motions cease, and while maintaining a reference point, release seat restraint.

4. Proceed hand over hand to nearest exit, without kicking feet. Exit aircraft with a strong arm pull through exit opening.

5. When clear of the aircraft, pull beaded handles to inflate the LPU-32/P and swim to surface. If the LPU-32/P fails to inflate, swim to the surface and manually inflate.



6. If necessary, the armor/tactical vest can be easily manipulated and discarded.



ACTIVATION

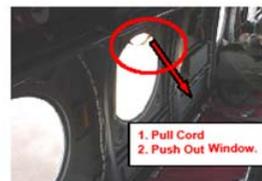
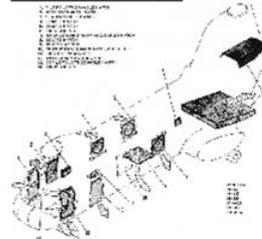
The LPU-32/P is auto-inflated by pulling both of the beaded handles down and away from the body as shown.



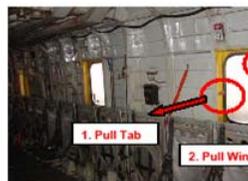
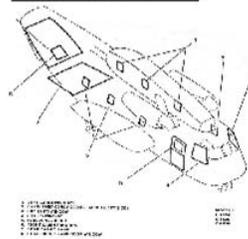
If the LPU-32/P fails to auto-inflate, manual inflation is accomplished by using the oral inflation tube, located in-between the inflation lobes, as shown below. The oral inflation tube can also be used to top-off an inflated preserver and to maintain inflation of a leaky preserver.



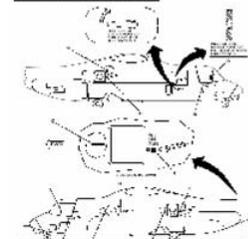
CH-46 SEA KNIGHT EXITS



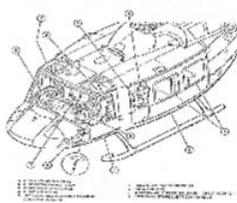
CH-53 SEA STALLION EXITS



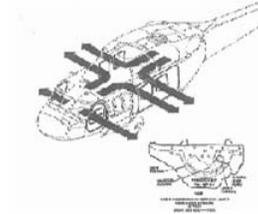
MV-22 OSPREY EXITS



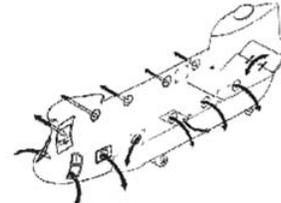
UH-1N HUEY EXITS



UH/SH-60 BLACK/SEA HAWK



CH-47 CHINOOK EXITS



HELICOPTER SAFETY BRIEF

- 1. SEATBELTS.** Passengers will be seated with seat belts unbuckled from take off to when signaled to release by the aircrew. Visually locate emergency exits.
- 2. MOVEMENT INSIDE AIRCRAFT.** Due to sudden movements of the aircraft, there is no passenger movement inside the aircraft while in flight.
- 3. SMOKING/DIPPING.** No smoking and/or dipping any tobacco products inside the aircraft at any time.
- 4. EMERGENCY PROCEDURES.** Follow all directions and instructions from the aircrew during emergencies. Remember to **REMAIN CALM, DO NOT PANIC.**
- 5. FIRE ON GROUND.** When directed, release seat restraint and egress the aircraft via the most viable emergency exit.
- 6. FIRE IN FLIGHT.** Remain seated; aircrew members will move passengers as required to fight fire.
- 7. FORCED LANDING/CONTROLLED DITCH.** Brace for impact and remain seated with seat restraint fastened until ALL violent motion stops. While maintaining a hold of a reference point, egress via the nearest exit.
- 8. UNCONTROLLED DITCH.** Follow directions from the aircrew. Brace for impact, hold reference point, and orient yourself towards exit. When all violent motion stops, proceed hand over hand to nearest exit. Exit aircraft with strong pull, pull beaded handles, and swim to surface.

For full size version of brochure, you can contact LT Heath Clifford





LTJG Syring testing new ejection seat trainer...circa 1908

LTJG Norton testing new centrifuge...circa 1911



60 sec after LT Welsh's final board question



Our new Specialty Leader: CAPT Syring



Aerospace Physiologists Helping to Protect the Blue Angels' Hearing



LCDR Peterson at El Centro helping the Blues with custom MAX40 hearing protection

FAILSAFE Social 2008



LT Clifford and LCDR Biles



CDR Hebert with some JO's at FAILSAFE social





LT Heath Clifford Outstanding Aerospace Physiologist



ND2 Nathaniel Young
Jim Janousek Jr. Enlisted Award
accepted by LCDR Lando



HM 1 Vernier
Bob Graham Sr. Enlisted Award



Mr. Robbie Powell
Outstanding Civilian



LCDR Brian Swan (Ret.)
Special Recognition Award accepted by CDR
Leland



CDR Russ Lawry
Special Recognition Award accepted by CDR
Wheaton



Website Gouge!

Acquisition Training: <https://www.atrrs.army.mil/channels/registernow/rnswitch.asp>

NOMI: <http://navmedmppte.med.navy.mil/nomi/nsti/index.cfm>

Joint Medical Executive Skills Institute (JMESI): <http://jmesi.army.mil/>

Joint Medical Executive Skills Program (JMESP): <http://nshs.med.navy.mil/eme2/home.asp>

Aviation Books Online: <http://amelia.db.erau.edu/ec/raconline.htm>

Aerospace Physiology Society: <http://www.aspsociety.org/index.php>

Navy Personnel Research, Studies, and Technology: <http://www.nprst.navy.mil/>

Navy Subspecialty System (need CAC Card for LOGIN): <https://navprodev.bupers.navy.mil/nss/>

Navy Officer Manpower and Personnel Classification: http://buperscd.technology.navy.mil/bup_updt/508/OfficerClassification/i/officerClassOneMenu.htm

Naval Aviation Survival Training Program SME: <https://nmo.med.navy.mil/nastpsme/index.cfm>

Verification of Military Experience and Training: <https://www.dmdc.osd.mil/appj/vmet/loginDisplay.do>

General Education and Training Module (NASA/AMES Fatigue Countermeasures): http://human-factors.arc.nasa.gov/zteam/webETM/GA_ETM/

Navy FITREP and Evaluation Resource: <http://www.navyfitrep.com/index.html>

Directions for Authors

1. Submit articles as Word documents only
2. 10 font Times New Roman
3. Single spaced justified text
4. List your name, rank, and current billet. Your picture is encouraged but optional.
5. If using references use the following style:

Gore C.J., Hahn A.G., Scroop G.C., et al. (1996). Increased arterial desaturation in trained cyclists during maximal exercise at 580 m altitude. *Journal of Applied Physiology*, 80, 2204-2210.
6. When submitting photo or image, make sure the pictures are in the order you wish them to be presented and list them with a figure number (i.e. Figure 1). **No PDF images please.**
7. It is your responsibility to ensure spelling, grammar and style issues are resolved prior to submission. SUSNAP Journal Editors will review your article for errors to the best of their ability, but there is no guarantee that they will catch all mistakes.
8. Once your article is submitted changes may be made concerning grammar, spelling or cosmetic issues, but content will not be modified
9. Articles can be submitted via email to LT Welsh. timothy.welsh@med.navy.mil (valid only through 15 June 2008).
10. Please provide email address



BY-LAWS OF THE SOCIETY OF U.S. NAVAL AEROSPACE PHYSIOLOGISTS

Article I.

Name

The name of this Society shall be the Society of U. S. Naval Aerospace Physiologists.

Article II.

Object

The object of this Society shall be to advance the science, art, and practice of Aerospace Physiology and its application to Naval Aviation and the mission of the U.S. Navy; to foster professional development of its members and enhance the practice of Aerospace Physiology within the Navy; to strengthen professional and fraternal ties; and to optimize solidarity and the professional standing of U.S. Naval Aerospace Physiologists.

Article III.

Membership

1. The membership of the Society will consist of those U.S. Navy Medical Service Corps officers who have been designated U.S. Naval Aerospace Physiologists, and all others who shall meet the qualifications of various types of membership as set forth in the By-laws of the Society.
2. General membership in the Society shall be open to all designated U.S. Naval Aerospace Physiologists:
 - a. Who are currently on active duty with the U.S. Navy.
 - b. Who have served at least 2 years of active duty with the U.S. Navy as Aerospace Physiologists, and were separated under honorable conditions, or
 - c. Who are members of the U.S. Naval Reserve in a selected or inactive status.
3. Charter members shall be those members joining the Society prior to 01 July 2000.
4. Members have the right to seek and hold office in the Society; to nominate and vote for officers; to initiate and vote on constitutional amendments and changes to the By-laws; and have such other rights and privileges as are set forth in the By-laws of the Society. Members have the obligation of service to and financial support of the Society.
5. Membership shall be of the following classes:
 - a. Members. Those individuals meeting the above qualifications, but not eligible for Emeritus status (as defined below) shall be considered members of the Society upon application for membership and payment of the first year's dues.
 - b. Emeritus Members. Those individuals meeting all requirements of membership, and who have retired from active or reserve service by reason of age, length of service, or physical disability. Members will automatically become Emeritus members upon the effective date of such retirement. Emeritus members hold full membership rights and responsibilities.
 - c. Honorary Members. The Board of Governors may, by a two-thirds majority, elect to provide Honorary Member status any individual who has given noteworthy support to Naval Aerospace Physiology and its related fields. This membership is considered perpetual (lifetime) and free of dues, but does not allow the member the right to hold office or vote on Society issues.
 - d. Auxiliary Members. The husbands and wives of members and Emeritus members are considered auxiliary members. Membership is free of dues and remains in effect for the duration of the spouse's membership. This level of membership does not allow for the holding of office or voting on Society issues.

Article IV.

Officers

1. General. The officers of the Society shall consist of a President, Vice-President, Secretary, Treasurer, and a Historian, Emeritus member, and 5 Members-at-Large. Collectively, the officers shall constitute the Board of Governors. The Board of Governors shall be elected from members and Emeritus members of the Society, subject to the limitations contained in Article II. The President Elect and Past President may participate in Board of Governors activities, but are not considered voting members of the Board.
 - a. Election shall be by blind written ballot mailed to the members and Emeritus Members at least 30 days prior to the annual membership meeting. The incumbent President is responsible for the tallying of votes and reporting the results.
 - b. The Presidency shall be transferred from the standing President to the President Elect during the annual meeting,



and other offices shall be transferred as soon as practical following the conclusion of the annual meeting. Newly elected officers shall be responsible for the conduct of the affairs of the Society for the next succeeding year, and for the planning and conduct of the next annual membership meeting.

2. Officers

President. The President Elect shall succeed to the office of President the year following his election. The President shall direct the activities of the Society and preside over the annual membership meeting. He/she shall appoint all committees on advice from the Board except the nominating committee, and shall be an ex-officio member of all committees, including the nominating committee. His/her term of office shall be 1 year. An individual may not serve more than 2 consecutive terms in this position. The immediate past President may be retained as a consultative (non-voting) member of the Board, at the discretion of the President.

President Elect. The President Elect is considered a non-voting member of the Board of Governors. The President Elect will automatically succeed to the office of President the year following his election. The President Elect is a one year term. The President Elect is considered a non-voting member of the Board of Governors.

Vice-President. The Vice-President shall assist the President in directing the activities of the Society. He/she shall act as President in the event of that officer's absence or temporary disability. If the President becomes permanently unable to discharge the duties of his/her office, as determined by a two-thirds majority of the Board of Governors, the Vice-President shall immediately succeed to the Office of President, serving as President for the remainder of the unexpired term of the predecessor. A President, who succeeded to the Office due to the disability of the preceding President, will discharge all powers of the Office of President. The term of Office of the Vice-President will be 1 year. An individual may not serve more than 2 consecutive terms in this office.

Secretary. The Secretary shall be responsible for the minutes of the annual meeting, the meetings of the Board of Governors and, all other general correspondence of the Society and the Board of Governors. The Secretary term will be 1 year. The Secretary may be re-elected to succeed in office for up to 2 terms (3 years total).

Treasurer. The Treasurer shall be responsible for the receipt, disbursement, and accounting of the Society's funds. A financial report for the preceding year will be prepared and presented at the annual membership meeting. The Treasurer's term will be 1 year. The Treasurer may be re-elected to succeed in office for up to 2 terms (3 years total).

Historian. The Historian shall be responsible for the investigation, updating, archiving and chronological documentation of the Aerospace Physiology community history. Specific emphasis will be put on efforts and contributions provided during heightened operational readiness. The Historian term will be 1 year. The Historian may be re-elected to succeed in office for up to 2 terms (3 years total).

Emeritus Member. The Emeritus member shall be responsible for representing the Emeritus community in Board of Governor and Society activities. The Emeritus member will be elected for a 1-year term. There is no limit to the number of consecutive terms that the Emeritus Member may serve.

Member-at-Large of the Board of Governors. Five members will be elected to the Office of Member-at-Large of the Board of Governors. Term of Office for Members-at-Large is 2 years. Elections shall be held so that no more than 3 Members-at-Large change on any given year. In the case of the first year, two members will serve only one year terms, in order to establish the appropriate rotation of elections.

Article V.

Meetings

1. A general membership meeting shall be held annually. The President, with concurrence of a majority of the Board, may defer or postpone a meeting for just cause such as a National Emergency. A Quorum at a general membership meeting shall be 25% of the membership in good standing.

Article VI.

Board of Governors

1. General. The interim governing body of the society shall be a Board of Governors which shall consist of 11 voting members as described in Article III. The immediate past President and President Elect may be retained as consultative (non-voting) members, at the discretion of the President.



2. Duties and Powers. The Board of Governors shall be empowered to transact all business whatsoever in the name of the Society between general membership meetings, as provided in Article V of the Constitution, except that the Board cannot increase dues or levy assessments.

3. Meetings. The Board of Governors shall meet at least once in each calendar year. Special meetings of the Board may be called by the President, who shall function as the Chairman of the Board, or by written request of at least 4 members of the Board. All meetings shall be conducted following standard Parliamentary Procedures.

a. Five of the Board members shall constitute a quorum. Board members may appoint proxies to act and vote in their behalf, and these shall be counted in determining a quorum.

b. The President shall communicate in writing with all members of the Board within 90 days of a previous meeting of the Board, and within 90 days of any previous written communication, submitting for approval any business of the Society requiring approval of the Board.

c. The President in any communication with the Board members shall forward formal motions submitted in writing by any Board member to the President for approval.

d. The letter from the President, combined with the written replies of the members, shall be considered to constitute a meeting of the Board.

e. The Chairman may request approval of specific proposals by Board members by electrical means (various internet methodologies).

f. In the event that the President is unable to function as Chairman at a Board meeting, the Vice-President, Secretary, Treasurer, or Historian shall assume the Chairmanship, in that order.

4. Reports. The Secretary, or in the Secretary's absence, any Officer appointed by the President, shall prepare minutes of all Board meetings, which shall be distributed to all members of the Board. A summary of these minutes shall be prepared by the Secretary covering the period between general membership meetings, and be read by the Secretary at the next meeting.

Article VII.

Committees

1. There may be standing committees or ad hoc committees.

a. The President of the Board, may establish such committees as are deemed appropriate, appoint a chairman, identify members for such committees, and establish rules and guidelines for such committees.

b. The President will be an ex-officio member of all committees.

c. The special conditions relating to the Nominating Committee membership are set forth in Article VIII.

Article VIII.

Nominations and Elections

1. Nominating Committee. The Nominating Committee shall consist of the President of the Society, and 4 members/Emeritus members not currently serving on the Board of Governors, and selected by the Board of Governors.

a. Membership on the Nominating Committee shall be for 1 year.

b. Members of the Nominating Committee may themselves be nominated by the Committee for election to an office within the Society; however, prior to being placed on the ballot, such a nominee must be approved by a simple majority of the Board of Governors.

2. Nomination. The Nominating Committee shall select at least 2 but no more than 3 nominees for each office to be filled at the next election, taking into consideration the length of terms for current Members-at-Large of the Board, and any requirements specified in Article IV. Nominated individuals must verify their willingness to serve in office prior to finalization of the ballot. Individuals may be elected to only 1 office.

c. Procedures

(1) At least 90 days prior to the next scheduled annual membership meeting, the Nominating Committee will submit to the Secretary the names of nominees for the various offices to be filled.

(2) The Secretary shall ensure that the nominees are members/Emeritus members of the Society in good standing,



and that the Board of Governors has approved any nominee who is also a member of the Nominating Committee.

(3) The Secretary shall prepare a ballot listing the names of nominees, as well as space for write-in vote's equivalent to the number of officers to be elected, and shall mail such ballot to all members at least 1 month prior to the annual membership meeting.

3. Election. Ballots shall be returned to the Secretary by mail or by hand prior to a time announced by the President and/or on the ballot. Ballots shall be in a sealed envelope marked "Ballot" with the name of the voter clearly marked on the envelope, but not on the ballot. Prior to the announced close of voting, a member may request the return of a previously submitted ballot, so that a substitute new ballot may be submitted. Following the close of voting, the Nominating Committee shall count the ballots and certify the results to the President who shall announce them as soon as possible.

4. Criteria for Election

a. The incumbent President shall vote only in the event of a tie for any office.

b. The nominee with the greatest number of votes for each office is considered the elected officer. Whenever more than 1 officer is being elected to Member-at-Large status, those receiving the highest number of votes will be considered elected in sequence to the number of vacating offices.

Article IX.

Dues

1. Annual membership dues, for all dues-paying classification of members, is \$10.00. Lifetime membership is \$200.00 for Members, and \$100.00 for Emeritus Members. Dues, once paid, are non-refundable.

2. Changes to dues, and special assessments, may be levied and be effective immediately by simple majority vote of all members casting a mail ballot or a majority of voting members voting at the annual meeting where a quorum is present.

3. Annual dues are due by the close of the annual business meeting. Members who fall more than 1 year in arrears in dues will be suspended from the Society.

Article X.

Finances

Funds shall consist of annual dues and assessments as determined by the Society, other

fees received by the Society, and such income as may be derived from interest, donations, and other sources.

The fiscal year shall begin on the first day of the calendar year.

Article XI.

Conduct of Meetings

1. In all matters not covered by these By-laws, the provisions of *Robert's Rules of Order* shall apply.

Article XII.

Amendments

1. Proposed amendments to the By-laws must be made in writing and require the endorsement of 10 or more members, or two-thirds majority of the Board of Governors.

2. All proposed amendments then will be submitted to the general membership of the Society for ratification. Ordinarily, the business of ratification will take place at the annual meeting; however, a mail vote may be taken on urgent issues, with the approval of a majority of the Board of Governors.

3. Regardless of the voting medium, there shall be a 60-day interval between sending notification to all members regarding the proposed formal amendment and the final tally of approval/non-approval votes. The Secretary shall inform the membership about the proposed amendment(s) at or before the annual meeting.

