

NTSA's Training Industry *news*

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Current *news*

Brazil Outlines Procurement Plans

Reprinted from *Aerospace Daily & Defense Report*

The Brazilian government is spelling out major emerging acquisition plans that include new satellites, an intelligence aircraft, armored vehicles and ships. The broad outlines of the massive spending initiative are presented in a document the Brazilian defense ministry released at the LAAD Defense & Security show. The document also shows that the country is targeting 2019 for development of an indigenous fighter, the F-XBR. The timing of F-XBR could be affected by delays in the F-X2 project, since the acquisition of the latter aircraft will import technology know-how to underpin the indigenous effort. Saab, Boeing and Dassault are competing for F-X2, but are uncertain when a decision will come.

Chinese Government Official Urges U.S.-Chinese Space Cooperation

Reprinted from *Space News*

A top Chinese government space official on April 14 appealed to the U.S. government to lift its decade-long ban on most forms of U.S.-Chinese space cooperation, saying both nations would benefit from closer government and commercial space interaction. He specifically called for cooperation on manned spaceflight, in which China has made massive investments in recent years. Lei Fanpei, vice president of China Aerospace Science and Technology Corporation, which oversees much of China's launch vehicle and satellite manufacturing industry, said China purchased more than \$1 billion in U.S.-built satellites in the 1990s before the de facto ban went into effect in 1999.

Cyberwarriors Worry About Kinetic Effects from Cyberattacks

Reprinted from *Aerospace Daily & Defense Report*

U.S. planners fear physical or kinetic destruction from cyberoperations—a phenomenon demonstrated by a tragic example of cyberfratricide that occurred in Siberia in 2009. An employee of the Shushenskaya hydroelectric power plant used a

cybernetwork to remotely, and accidentally, activate an unused turbine with a few errant key strokes.

The offline turbine created a “water hammer” that flooded and destroyed the plant, killing dozens of the facility's workers, according to Edward Timperlake, a defense analyst and former Pentagon director of technology assessment and international technology security. The ability to turn that kind of mistake into a cyberweapon that can create catastrophic effects is a fear of U.S. specialists. At risk are power grids, oil distribution networks and transportation systems.

Virginia Students Work with Industry in Test

Reprinted from *Aerospace Daily & Defense Report*

Collaboration between students and industry on a project to improve the accuracy of hypersonic engine testing is moving forward with the unveiling at the University of Virginia of a full-scale mock-up of a scramjet experiment to be flown in 2012. Graduate and undergraduate students of the University of Virginia's School of Engineering and Applied Science are working with faculty and industry on the Hy-V program to ground- and flight-test a scramjet to develop improved methods of testing hypersonic engines.

A scramjet payload designed by University of Virginia with Allied Techsystems' GASL division is planned to fly from NASA's Wallops Flight Facility in Virginia in 2012, says Chris Goynes, research assistant professor of aerospace engineering and principal investigator for the flight mission.

Hy-V is being funded by the Defense Department. Because the program involved graduate and undergraduate students at the University of Virginia and Virginia Tech, NASA Wallops is providing the sounding rocket and range services under its university outreach effort.

U.S. Should Update Plan to Fight Pirates

Reprinted from *Aerospace Daily & Defense Report*

While the U.S. government has made progress countering piracy in collaboration with industry, the nation's leaders have failed to update the country's

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A non-profit organization that serves the interest of the simulation, training services, training support, and computer-based training systems industries.

President's *notes*

Rear Adm. Fred Lewis, USN (Ret.)

For NTSA Members:

In June 2011, NTSA President, Rear Adm. Fred Lewis, USN (Ret.), gave the keynote address at the annual Meeting of the Simulation Industry Association of Australia. In his remarks, he summarized his views on the current state of modeling and simulation technology, some of the challenges it faces and what the future may hold. Here is the text of his remarks.

The theme of this event, as given to me, is excellence and how it may be achieved in the military training context. I would nevertheless like to think that what we strive for in all our common endeavors is perfection—an admittedly unattainable goal in an imperfect world, much like perfect moral virtue. I stand before you as an example of the latter, having been known by the call sign “Bad Fred” in a previous existence. While perfection may be beyond our reach, Henry Royce of Rolls Royce remarked, “strive for perfection in everything. Take that which exists and make it better. If it doesn't exist, create it.” Now, I fully recognize that the pursuit of excellence itself is a worthy and often difficult aim point. But our men and women in the field deserve not only the excellence of the training already provided them, but the constant effort to transcend that level. Mission success, lives and ultimately our national security depend in great measure on our quest for what lies just beyond excellence.

Before addressing the various ways modeling and simulation training contributes to the achievement of excellence and beyond in military operations, it might be useful to briefly review the role the National Training and Simulation Association plays in advancing the industry and community of practice.

Fundamentally, NTSA exists to inform and educate the public about the importance of modeling and simulation training in everyone's daily life and the promise it holds for all our futures. We do this by providing national and worldwide platforms for the entrepreneurial needs of the industry while simultaneously promoting dialogue about future trends and directions. I/ITSEC is of course the annual culmination of these efforts. Our goals at I/ITSEC, broadly stated, are to:

- Establish and maintain a climate which is conducive to successful business contacts and transactions among hundreds of exhibiting entities.
- Provide multiple avenues for in-depth exploration of the present potential and future promise of the industry.
- Involve as wide a variety of persons and organizations in I/ITSEC as possible, mirroring the expansion of modeling and simulation into ever more diverse fields.
- Mesh these elements into a cohesive whole which is truly greater than the sum of its parts and which advances the interests of the entire M&S community.

As we look back over how the technology has progressed as it has manifested itself at I/ITSEC and in the many technical sessions that populate I/ITSEC and advance the state of the art, we see several dramatic developments over the past ten years or so. Some time ago, before computer processing began its steep upward curve, we were limited to simulated environments which were obviously that. Trainees realized they were not in anything very close to real-world environments, but that was acceptable, as they also trained in live environments, which compensated for the shortcomings of the simulators. Then we entered a second phase, in which simulators approached reality more closely, but weren't quite there. Under these circumstances, trainees had difficulty relating to the simulated environment, as they knew they were not in a real world situation, but we were getting close—the “suspension of disbelief” was not quite possible. At this point as well, we were training exclusively in the “man-machine” environment, teaching how to manipulate complex platforms under difficult, challenging circumstances. Now, however, we find ourselves on the verge of a new simulation realm, and in some instances we're already there. Simulation technology has now advanced to the point that the trainee has greater difficulty distinguishing the virtual environment in which he or she is placed from reality. This is a very important development, as, for the first time, we can invoke something close to a the emotions and stress one would experience in a real environment through artificial means. By so doing, we can now come close to preparing our warfighters and anyone else to face stressful, even life-threatening situations and master them, producing optimum outcomes based solely on the virtual training experience.

Even more recently, and as a direct result of the emergence of irregular conflict and asymmetrical threat environments, we have seen the urgent demand for the most complex form of simulation training—what can be called the “human to human” interface. Human to human interactions, as we all recognize, are orders of magnitude more complex than interactions with mechanical devices, regardless of how sophisticated. All the nuances of body language, speech, cultural norms and many other subtle but vitally important clues to attitude and intent must be taken into account. Given the security environments in which we operate today—be it interaction with a tribal elder, a passenger at an airport security checkpoint, or even a visa applicant from a third world country—this new training realm is critically important, if unforeseen only a decade ago. While we are making comprehensive strides toward bringing these training environments up to the level of maturity the industry has achieved in other areas, we still have a considerable distance to go. We are now at the stage where the “suspension of disbelief” is still difficult to achieve, inserting an element of

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The Global marketplace

Three Fighters in Japanese FX Competition

Reprinted from *Aerospace Daily & Defense Report*

Japan has issued its much-anticipated request for proposals for FX fighters and three aircraft are in contention: the Boeing F/A-18E/F, Eurofighter Typhoon and Lockheed Martin F-35. The defense ministry disclosed last year that it also would be interested in receiving proposals on the Lockheed Martin F-22 exports. Dassault's spokeswoman in France was unavailable for comment. Japan issued the request for proposal in April. It had been aiming for a release toward the end of March, but there was a two-week delay because government agencies were busy with the relief effort in the wake of the March 11 earthquake and tsunami that devastated northeast Japan. The tsunami swamped the Japan Air Self-Defense's Matsushima air base, causing saltwater damage to 18 Mitsubishi F-2 trainer aircraft. The ministry reportedly has put in a request to Japan's cabinet for funding to repair the aircraft. Japan plans to replace its aging McDonnell F-4s.

Lockheed Signs to Develop Cargo Airships

Reprinted from *Aerospace Daily & Defense Report*

Lockheed Martin has signed a contract to develop a family of commercial cargo airships for a private Canadian company that plans to sell the aircraft to the oil and gas industry and other sectors for heavy-lift transport missions in remote and inaccessible regions. Calgary, Alberta-based Aviation Capital Enterprises will pay the U.S. manufacturer to develop, certify and produce a series of aircraft based on the P-791 hybrid airship demonstrator built and flown by Lockheed's Skunk Works in 2006. "Lockheed Martin has invested over \$100 million in intellectual property over the last decade and will not put in any money going forward. We will fund development and certification," says Kirk Purdy, executive chairman of Aviation Capital.

Indian Foreign Direct Investment Decision is "Under Construction"

Reprinted from *Jane's Defence Weekly*

The Indian government has confirmed that a decision is pending on whether to increase the limit on foreign direct investment in defense beyond its existing 26 percent. In a parliamentary reply on

March 7, India's Minister of State for Defense M. M. Pallam Raja said that the move to increase foreign direct investment in defense "is under inter-ministerial consultations and a final decision will be taken by government thereafter." An increase to the foreign direct investment cap was recommended by India's Department of Industrial Policy and Promotion in May 2010, although whether New Delhi was expected to officially respond to the suggestion was unclear. The Department of Industrial Policy and Promotion said in a discussion paper that foreign direct investment in defense should be increased to at least 74 percent to encourage foreign companies to boost investment and transfer military technologies to Indian companies.

Exports On

Reprinted from *Aerospace Daily & Defense Report*

Based on direct commercial sales data, the U.S. State Department's Bureau of Political-Military Affairs expects little change in the high foreign demand for U.S. military products, an official said May 3. Andrew Shapiro, the undersecretary who heads the bureau, says officials expect to grant about 84,000 export licenses this year, equaling the range of 80,000-85,000 granted annually over the last several years. The total value of authorized direct commercial sales is approximately \$145 billion, or about one percent of gross domestic product. But Shapiro also echoed Wall Street analysts and warned that U.S. sales are not guaranteed.

Upcoming events

Registration is open for these upcoming events.

AUGUST 2-4, 2011 • ADL IMPLEMENTATIONFEST 2011 • ROSEN CENTRE HOTEL • ORLANDO, FL

AUGUST 16-19, 2011 • AUVSI'S UNMANNED SYSTEMS NORTH AMERICA WASHINGTON, DC

OCTOBER 11-14, 2011 • MODSIM WORLD • VIRGINIA BEACH CONVENTION CENTER VIRGINIA BEACH, VA

Please visit www.trainingsystems.org for more information or contact Barbara McDaniel at (703)247-2569 or bmcDaniel@ndia.org

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distraction into the training equation.

It might be interesting to note that this is an area where private industry has taken the lead through development of PC-based “first person shooter” and more advanced games. While the military has pioneered development of much of the bedrock of simulation technology, the commercial demand for ever more complex and realistic video games has resulted in remarkable strides in fidelity and in user flexibility that the military is just now beginning to capture in small unit training scenarios. I am pleased to note in this regard that the serious games competition at I/ITSEC is beginning to play a significant role in advancement of military applications for PC-based games, with a number of the games shown and awarded at I/ITSEC being selected for further commercial development and ultimately for full scale utilization as training tools.

I believe that in the not too distant future, we will train with avatars, wholly immersed in a three dimensional alternative world. Creating such environments is in fact the next great technological challenge for our industry. With it, among other precedent-setting applications, we will be able to expose our warfighters to new and unfamiliar cultures, allowing them to learn by immersion, for example, in the middle of a Middle Eastern marketplace. I do not believe this level of technology will be available as we pursue our objectives in Iraq and Afghanistan, but we will nevertheless see it in the not far future, and it will play an invaluable role in many critical areas of national importance. We are for the moment, however, in an interim period, where live training must still remain the order of the day, embracing as it still does all the attributes virtual technology is still groping toward.

As a consequence of the remarkable scientific progress we are witnessing, modeling and simulation technology has begun to infuse itself into many more aspects of human learning. Simulation, for example, is now rapidly becoming an indispensable element in medical and healthcare training. Surgical trainees, not long ago, went from books and lectures straight into the operating theater. What they lacked was the experience of operating on real patients without the risk mistakes could entail. Simulation is now filling that gap by providing experiences close to the real thing. Today, any response the human body is capable of can be mimicked to produce a very rich learning environment. One of the most rapidly growing areas of modeling and simulation, this has remarkable implications for further improvement in the already remarkable strides in battlefield casualty management in the past few years. Provision of artificial environments to aid physical and mental post-traumatic recovery is also now well under development, with promising implications for patient outcomes.

Simulation is also beginning to play an important role in predicting healthcare crises and in training patients to maintain treatment regimes. Virtual ERs train teams in highly realistic, stressful environments, preparing them for the mass casualties natural or man-caused disasters could produce. Healthcare simulation, in

common with all simulation training, is a great cost saver—of obvious importance as the U.S. grapples with spiraling healthcare costs now and for the foreseeable future.

In like manner, simulation technology has lately permeated other areas involving a variety of predictive applications, from complex models of social systems to weather analysis and prediction to a wide variety of stress analysis determinations in construction and other similar applications. Maintenance training is an area which has emerged almost from nowhere in the past few years to being an invaluable tool in cost-effective equipment maintenance, both civilian and military. These applications can only expand, both in accuracy and in range of application, as processing power continues its steep upward curve.

We clearly face constant or declining defense outlays for the next several years at least. The role of modeling and simulation technology in alleviating some of the adverse consequences of this situation becomes even more important and obvious than in happier days. The man-machine interface, as I have mentioned, is now a very mature technology with simulation replicating very closely the sights, sounds and feel of the real thing. This fidelity allows us to supplant, to a great extent, live platform training. Every hour spent in a simulator is an hour's fuel saved, as well as lubricants, and even use of land, in the case of surface vehicles. It also means savings in expensive replacement parts and major overhauls, reducing as it does wear and tear on our already overtaxed equipment. “Down time” is thus reduced, making equipment more mission-available. Less time spent on maintenance translates directly into personnel savings and availability of personnel for other duties.. Simulation thus contributes directly to a reduction in DoD's Operations and Maintenance and Personnel accounts—savings that can be redirected into other critical categories such as R.T.D.&E. and Procurement.

If we take a look at modeling and simulation applications in force structure determination, we see a dramatic increase in the role played by the technology. A good example of this is the JTLS—the Joint Theater-Level Simulation, which has become an important tool for training across services, distance, and time. While the JTLS focuses primarily on the operational level, it incorporates significant tactical level capabilities, making it uniquely suited to modeling multi-sided coalition warfare. JTLS, by modeling air, ground and naval elements with special operations and logistical support, incorporates all elements of simulation—live, virtual and constructive—into a seamless, distributed learning environment. The JTLS also incorporates links to most in-use C4I environments and other models through customized interfaces, allowing maximum flexibility, including high-level architecture applications. A further recent refinement of JTLS has been the development of JCATS—the Joint Conflict and Tactical Simulation, which provides the lower, or entity-level representation with JTLS integrating the JCATS into the higher-level aggregate representation. By constantly updating the interactions of all elements and inserting them into a matrix, the interplay of force

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Training & Simulation *report*

Australian Firms Prepare to Vie for Training Work

Reprinted from *Defense News*

Australian defense and aerospace firms are forming teams and picking platforms as they gear up to compete for a pair of military training deals valued at almost 3 billion Australian dollars (\$3.1 billion). First up is a program to provide platforms, simulators, courseware and instructors to train rotary-wing crews of all three military services. Dubbed Project AIR 9000 Phase 7 (helicopter aircrew training system), the program is expected to issue a request for proposals in late 2011, and aim for initial operational capability in 2016 or 2017. The program's value is expected to be nearer the high end of a range from 500 million to 1 billion dollars.

Lockheed Martin announced a teaming agreement with Bristow Helicopters at the March 1-6 Australian International Air Show, but has yet to pick a training aircraft or to decide whether to add a provider of synthetic training devices to the team. Lockheed's Simulation Training & Support division is part of a consortium that provides flying training to the Singapore Air Force, and it is part of a 25-year deal, along with Britain's VT Group, to train U.K. military aviators. Bristow has major civilian helicopter presence in Australia and provides rotary-wing assets to the U.K. military.

RAN's New Simulator

Reprinted from *Defense News*

Junior officers in the Royal Australian Navy will learn to pilot the next generation of warships in an upgraded 10 million Australian dollar (\$10.2 million) training facility at HMAS Watson Maritime Warfare School, Sydney. The simulator uses virtual-reality software to simulate a working warship's bridge. "Our Navy is the first in the world to use multiflex touch screens in a warship bridge simulator," said Rear Adm. Steve Gilmore, commander of the Australian Fleet, in a Defence Materiel Organisation news release. The simulators replicate the full range of maritime operations likely to be experienced while on the bridge of a warship, and they can be reconfigured to match most classes of ships in the fleet. Functions include boat operations, interdiction, and docking and beaching ops.

Iraq Takes Delivery of Mi-17 Helo Simulator

Reprinted from *Jane's Defence Weekly*

Slovakia formally handed over an Mi-17 CT FTD helicopter simulator to the Iraqi Armed Forces on March 16. The simulator was commissioned by the U.S. Defense Department for the Iraqi Air

Force, which operates a fleet of Mi-17 medium multirole helicopters. It was produced in a joint venture by Virtual Reality Media of Dubnica nad Vahom, Slovakia, and the U.S.-based Fidelity Technologies Corporation. Iraq operates a fleet of eight Mi-171E and 16 Mi-17 helicopters, purchased mostly from Russia and upgraded in the United Arab Emirates. Most of these aircraft were purchased in coordination with U.S. Forces Iraq's Iraqi Security Assistance Mission.

Lockheed Martin Unveils Orion Simulation Center

Reprinted from *Aerospace Daily & Defense Report*

Lockheed Martin unveiled its suburban Denver Space Operation Simulation Center (SOSC) on March 21, a large development, evaluation and testing facility for NASA's Orion/multi-purpose crew vehicle. Lockheed hopes to launch Orion on its first test flight in 2013 and prepare for congressionally-mandated operations by the end of 2016.

The 41,000-square foot environmentally friendly SOSC was constructed on deep Colorado bedrock, isolated from regional seismic disturbances, to provide a stable testing environment for the evaluation of precision instrumentation. Located at Lockheed Martin's Waterton Facility, the new center hosts the first Orion ground test article, which was shipped from the company's Michoud Assembly Facility in New Orleans in early February.

The flightworthy test article will undergo performance testing at SOSC to recreate the conditions experienced during the ascent, launch abort, in orbit, re-entry, descent, parachute and water recovery regimes. Orion would be restricted to crew rescue duties at the International Space Station under the strategy outlined by President Obama last year. However, Congress favors the deep-space exploration mission designated by the NASA Authorization Act of 2010. The facility's capabilities include Orion space station docking as well as asteroid encounter simulations.

Simulator Delivered

Reprinted from *Defense News*

IFAD, Odense, Denmark, has delivered to the Danish Army Fire Support School its IFAD forward air controller training solution (IFACTS), a deployable, PC-based system for training and practicing close air-support direction. IFACTS is networked with the Army's joint conflict and tactical simulation system, which generates and controls training scenarios, IFAD said. Intercom and radio communication is handled by IRAS, a radio communications simulator provided by IFAD.

November 28 - December 1, 2011 • Orange County Convention Center • Orlando, FL
Interservice/Industry, Training, Simulation and Education Conference (I/ITSEC)

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structure decisions can be observed and adjustments toward the optimum force mix made. JTLS is also an enormous money-saver, as by creating artificial conflict environments across continents, it can supplant highly expensive, time and resource-consuming live exercises. An additional learning outcome is that it inculcates in the participants the habit of thinking in a joint operational context.

I have been asked to say a few words about efforts we at NTSA are making in concert with our elected representatives on behalf of the industry and community we represent. While it would be inappropriate and presumptuous of me to suggest ways you at SIAA could interface with the government of your country, perhaps I can provide some information that might be applicable in your context. For a number of years, NTSA has enjoyed a close and very productive working relationship with the Congressional Modeling and Simulation Caucus, ably headed by Representatives Randy Forbes and Solomon Ortiz. We worked in concert with them to develop House Resolution 487, which designated modeling and simulation as a national critical technology. Recently and again with the active participation of the Caucus, we convened a meeting of key industry stakeholders and others deeply involved in the simulation community to establish the goal of having modeling and simulation recognized as a discipline, a profession, and an industry and market with its own identity and one that is critical to meeting the socioeconomic and technological challenges facing our nation. Modeling and simulation's very success in permeating much of human technology may have created a problem here, as it may well have become so embedded in all technology and human learning that its signal, individual contribution has been obscured.

NTSA and the Modeling and Simulation Caucus also collaborate in presenting an annual exhibition of M&S technology on Capitol Hill each year, with the aim of raising awareness among our elected representatives and their professional staffers of the vitality of the industry and the significance of its contribution to the national welfare.

I would be remiss if I did not touch on another area in which modeling and simulation can play a vital role. We must, with urgency, develop an effective national defense against cyber terrorism that protects our communications infrastructure—including military and other national security assets—as well as our civilian emergency response infrastructure and our economic and commercial networks. Much attention and effort, at the national, regional and local levels, is now being directed against this challenge, with good reason. A successful cyber attack could cause cataclysmic and long-lasting damage to each of these vital nodes. While technology has made us much more vulnerable to cyber threats, simulation can play an important role in preparing for such an onslaught, through its ability to replicate complex theoretical events and train for optimum outcomes. This is a challenge of utmost national concern, and one I call on industry to meet. Modeling and simulation has unique attributes that can very significantly reduce the conse-

quences of a wide range of cyber aggression if we use it promptly and appropriately as an integral part of our preparations.

In closing, it might be instructive to note the advantages and limitations of training technology as it exists today in the recent dramatics surrounding the dispatch of Osama bin Laden to his virgins in the sky who have undoubtedly been waiting patiently all these years. While it has rightly been pointed out that bin Laden's demise may not have signified a turning point in our efforts against global terrorism, it nevertheless demonstrated the reach and power of we Western infidels to those who would establish the worldwide Califate.

It seems clear from what we know of the operation that both virtual and live training were utilized in its preparation. While the stealth helicopter crews very likely rehearsed their mission repeatedly in a virtual simulation environment, their colleagues no doubt trained in "shoot houses" specially constructed to replicate all observable features of Osama's residence, gathered from both human and signal intelligence. Each training environment, I submit, was best suited to the differing nature of the two operational environments—the delicate and stealthy air insertion of the SEALs and the rapid neutralization of the building's inhabitants and exploitation of its contents. I also might point out that the construction and use of the actual replica of Osama's house probably pointed up a few of the limitations of live training—it was relatively expensive and time consuming to construct and would have required some effort to modify had new or more complete information concerning the physical structure of the target come to light under further examination. None of these drawbacks would have been a problem with the virtual training environment of the helicopter crews. Had new information emerged concerning possible Pakistani air defenses, or, more probably, about the physical grounds of the compound itself, the simulation could have been adjusted practically in real time and at minimum cost to take these into account. This is emphatically not to discount the value of live training—it is irreplaceable and will remain so for the foreseeable future for actions like the bin Laden takedown. But, as virtual worlds become more of a possibility, some of the limitations of live training will become more apparent and will likely slowly yield to the inherent advantages of the virtual world.

All these remarkable developments in the way we prepare for dangerous, complex tasks are allowing us to approach new levels of excellence in how we train. This in turn means more assurance in mission achievement. As our challenges become more complex and nuanced, training of course must adjust accordingly. The remarkable fluidity of modeling and simulation technology—its ability to rapidly respond to new and unexpected training requirements—has been in ample evidence over the past decade and shows no signs of diminishing. Quite the contrary—the pace of the technology's development assures that excellence in how we prepare will continue to be the bedrock of our defense capabilities.

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Contracts

Three Firms to Design Advanced Interceptor

Reprinted from *Space News*

The U.S. Missile Defense Agency on April 7 awarded contracts totaling \$127 million to three firms for trade studies and initial designs for a new interceptor intended to defeat long-range missiles, according to a Pentagon announcement. Lockheed Martin Corporation of Bethesda, Maryland, received a \$442.2 million study contract for the standard missile (SM)-3 Block 2B interceptor; Raytheon Missile Systems of Tucson, Arizona, was awarded a \$42.7 million contract; and Boeing Defense, Space & Security of St. Louis was awarded a \$41.2 million contract.

The SM-3 Block 2B interceptor is planned to be deployed in 2020 as one of the later elements of the United States' so-called phased adaptive approach for European missile defense. It will be designed to destroy long-range ballistic missiles—with ranges of up to 12,000 kilometers—in the early stages of flight.

Raytheon is the incumbent contractor, having developed the SM-3 Block 1A interceptors that are deployed today on U.S. Navy ships and the more capable SM-3 Block 1B interceptors that are expected to begin flight testing this summer. Raytheon also is the prime contractor for the larger SM-3 Block 2A interceptor that the United States and Japan are co-developing.

Army GD and Iridium to Build Battlefield Handheld

Reprinted from *Space News*

General Dynamics C4 Systems of Scottsdale, Arizona, said March 18 it won a \$2.3 million U.S. Army contract to build a prototype handheld battle command system that gives dismounted soldiers and Marines the ability to securely communicate, share information and collaborate while on the move. General Dynamics is partnering with mobile satellite services firm Iridium Communications of McLean, Virginia, on the prototype system, a GD3000 body-worn tactical computer that weighs around 225 grams and hosts an app-friendly operating system.

When connected to a networked device, such as the mili-

tary's Joint Tactical Radio System Handheld, Manpack, small form fit rifleman radio or Iridium satellite telephone handset, the GD3000 will be able to make voice, video or data contact with other users in close proximity or kilometers apart. The contract, which calls for General Dynamics to deliver 40 prototype devices in September, was awarded under the Army's Joint Battle Command-Platform Handheld Program. Work will be done in Scottsdale and Fort Wayne, Indiana.

Sikorsky Wins Turk Helo Deal

Reprinted from *Defense News*

Turkey selected Sikorsky Aircraft as its partner company to lead production of the country's next-generation utility helicopters. Sikorsky, Stratford, Connecticut, defeated AgustaWestland, Cascina Costa, Italy, for the \$3.5 billion deal for a first batch of 109 platforms, Defense Minister Vecdi Gonul told reporters.

The Undersecretariat for Defense Industries, Turkey's procurement office, and Sikorsky Aircraft now will launch contract negotiations for building the first batch of 109 utility helicopters. Follow-on orders for more than 600 platforms could be worth more than \$20 billion, according to defense analysts.

Upgrades: Swiss Trainers

Reprinted from *Defense News*

L-3 Link Simulation & Training, Arlington, Texas, said it has been awarded a contract from Switzerland's arms procurement agency, Arasuisse, to upgrade the Swiss Air Force's F/A-18C tactical operational flight trainers and associated training system equipment to match modifications to the service's F/A-18C aircraft. Financial details of the deal were not disclosed.

The trainers enable pilots to jointly conduct simulated air-to-air and air-to-ground tactical maneuvers, aerial refueling and night-vision goggle operations. The trainers are also integrated with a simulated joint helmet-mounted cueing systems so pilots can practice control of targeting systems and sensors.

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This is for the best, as our adversaries have shown a remarkable ability to minimize their weaknesses and exploit areas of relative vulnerability at every opportunity. That they have not succeeded in their main objectives and indeed have been firmly placed on the defensive—forced to react to our initiatives rather than the reverse—again, in my view, shows how far we have come in the art of operational excellence in areas that were virtually unexploited only a decade ago. Excellence is therefore the plateau on which we must always strive to stand. The pursuit of perfection lies beyond—unattainable, as I have said, but worthy of our constant effort, if

only to assure that we remain fully rooted in that excellence we have won and would relinquish at our peril.

Thank you for according my remarks perhaps more attention than they deserve. I hope you will agree, at least, that what I may have lacked in brevity I more than compensated with superficiality. Actually, what I have attempted to do is to present a few of the issues and challenges facing a remarkable technology and the community that supports it. Its future, I believe, is truly one of enormous promise. Having observed modeling and simulation's remarkable growth and maturation over the past decade and more, I look ahead with some degree of awe as I contemplate a future in which reality and its virtual counterpart will coexist and blend seamlessly—to the benefit of us all.

Who's *where*

■ **Kathy Warden** has been named vice president and general manager of Northrop Grumman Corporation's cyber intelligence division, McLean, Virginia. Before joining the company in 2008, she was the senior vice president of a business unit supporting a secure space program and held other executive roles in the intelligence community.

The company also named **Mike Papay** sector vice president for cyber initiatives in the information systems sector for cybersecurity in McLean. In this role, Papay will lead the company's cross-sector cyber strategy development and associated activities to further establish Northrop Grumman's position and advance its role as a leader and provider of cybersecurity solutions.

■ Northrop Grumman Corporation, Los Angeles, named **David Ryan** vice president and general manager of its intelligence systems division, one of five divisions within the company's information systems sector in McLean. In this role, his group provides enterprise and mission solutions in such areas as integrated intelligence systems; geospatial intelligence; and intelligence, surveillance and reconnaissance processing.

■ United Technologies Corporation, Hartford, Connecticut, appointed **William Brown** senior vice president of corporate strategy and development. Brown will lead the business development and strategy organization and will be responsible for executing acquisition activities and driving cross-business-unit organic growth strategies, including expanding the company's capabilities in emerging markets and overseeing its integrated building solutions initiative.

■ **Mitch Snyder** has been promoted to executive vice president for military programs at Bell Helicopter, the Fort Worth, Texas-based Textron company said. Snyder was vice president and program manager for the V-22 program.

■ Qinetiq North America named **Scott Goldstein** senior vice president and general manager of the national systems business unit with the company's mission solutions group. Goldstein was chief technology officer and senior vice president of the systems engineering and advanced technology group at ManTech International.

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overall plan to fight pirates despite the escalation in attacks, the U.S. Government Accountability Office (GAO) says in a recent report. The U.S. has advised industry partners on self-protection measures, contributed leadership and assets to an international coalition patrolling pirate-infested waters, and concluded a prosecution arrangement with the Seychelles government, GAO notes in its March report.

"Many stakeholders credit collaborative efforts with reducing the pirates' rate of success in boarding ships and hijacking vessels," the report says, "but since 2007, the location of attacks has spread from the heavily patrolled Gulf of Aden—the focus of the action plan—to the vast and much harder-to-patrol Indian Ocean.

"Also, from 2007 to 2010 the total number of reported hijackings increased sevenfold, and, after dropping in 2008 and 2009, the pirates' success rate rebounded from 22 percent in 2009 to almost 30 percent in 2010. In addition, the number of hostages captured and the amount of ransom paid increased sharply, and pirate attacks have grown more violent," GAO says.

U.S. Requirements Process

Reprinted from *Defense News*

The U.S. Defense Department is scrapping the ponderously slow joint capabilities integration and development system process

(JCIDS), which defines acquisition requirements for the military. "We're starting to rewrite JCIDS. We're going to throw it away," U.S. Marine Corps Gen. James Cartwright, vice chairman of the Joint Chief of Staff, said April 14 before an audience at the 27th National Space Symposium. Cartwright said the new strategy would allow the Defense Department to more quickly buy urgently needed equipment. "It demands of industry to go out to get the tools that allow us to build a truck in less than 14 years," he said.

Sharper Eye

Reprinted from *Aviation Week & Space Technology*

Although it looks a little different externally from the original E-2A Hawkeye first deployed in 1965, the E-2D Advanced Hawkeye will find roles far beyond airborne early warning when it becomes operational late in 2014. The heart of the Hawkeye remains its radar, but its central place in U.S. Navy networking plans will give the E-2D an expanding role in battle management.

Radar enhancements, new sensors and wideband radios, expeditionary capability from land bases and in-flight refueling to extend endurance are among planned upgrades that will keep the Hawkeye at the center of naval aviation. Two development and three pilot-production E-2Ds have been delivered to the Navy. Four are based at NAS Patuxent River, Maryland, for flight testing,

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Major Program *report*

USMC Plans “Cats and Traps” F-35 Purchase

Reprinted from *Jane's Defense Weekly*

The U.S. Marine Corps is planning to purchase 80 carrier-capable F-35C Lightning II Joint Strike Fighter aircraft. Five squadrons will be established by the U.S. Marine Corps for operations from U.S. Navy aircraft carriers, the Corps said on March 14. The U.S. Marine Corps also intends to acquire 34 short-takeoff vertical-landing F-35B variants for deployment on the Navy's amphibious assault ships: 29 more than previously expected.

The Corps' split procurement plan is outlined in a memorandum of understanding issued on March 14 and signed by the two service chiefs and Navy Secretary Ray Habus. The move signals a departure from the U.S. Marine Corps' original plan to field only the short-takeoff vertical-landing variant of the Joint Strike Fighter as a replacement to the service's F/A-18C/D Hornet and AV-8B Harrier II fleets.

The memorandum of understanding called for a total of 83 F-35Cs to be procured for both services by Fiscal Year 2016, according to a transition plan provided to Jane's.

Harrier Ops Making Case for F-35B

Reprinted from *Defense News*

When U.S. naval strike jets hit targets in Libya in the pre-dawn hours of March 20, they weren't flying from aircraft carriers. Instead, the U.S. Marine Corps' short-takeoff vertical-landing AV-SB Harrier IIs did the job from the amphibious assault ship, *USS Kearsarge*. And that, said the senior Marine commander aboard, shows why his service needs the F-35B Joint Strike Fighter, the short-takeoff vertical-landing plane whose developmental problems have landed it under a two-year “probationary period” and made it a favored target of some budget-cutters.

“It would be lovely to have an aircraft carrier here, but there are not enough to go round,” said Col. Mark Desens, the commander

of the 26th Marine Expeditionary Unit, which operates the AV-8Bs aboard the *Kearsarge*. “What we do have is the opportunity to do a lot of things with this vessel, and we are accomplishing a tremendous return on investment with these six short-takeoff vertical-landing jets.”

U.S. Navy Releases Funding for Next Virginia Sub

Reprinted from *Aerospace Daily & Defense Report*

The U.S. Navy has released \$1.2 billion for construction of the 14th *Virginia*-class submarine (SSN-787) to General Dynamics Electric Boat, marking the beginning of production of two submarines per year on the *Virginia*-class program.

While the Navy had already contracted for the sub, the funding was delayed by the continuing resolution that capped Pentagon spending on many programs. The service and the two contractors building the submarines—Electric Boat and the Newport News Shipbuilding unit of Huntington Ingalls Industries—said if the next sub could not be funded by mid-year, the *Virginia*-class contracts would be in jeopardy. Release of the funding allows procurement of long lead-time components that will support the planned official construction start later this year.

The shipbuilding team's attention remains focused on capturing additional efficiencies wherever possible, says John Homander, Electric Boat's vice president for the *Virginia* program, in a statement. “Reducing the cost of *Virginia*-class ships to the point where the Navy can afford to acquire two ships per year has demanded an intense process of continuous improvement,” Homander says. Our task now is to ensure that we demonstrate additional improvement on each ship so taxpayers get the best possible return on the nation's investment in submarines.”

The *Virginia* class is the first U.S. Navy warship designed from the keel up for the full range of mission requirements in the post-Cold War era.

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and one at NAS Norfolk, Virginia, to train crews for operational evaluation beginning late this year. Development flight-testing is more than 90 percent complete, with the radar “100 percent tested,” says Capt. Shane Gahagan, Navy E-2/C-2 program manager.

“Radar test results have been very favorable,” he says. The E-2C was a Cold War, blue-water system, designed to detect long-range bombers carrying anti-ship missiles. The E-2D maintains that capability, but adds littoral and overland surveillance to help defend against stealthy cruise and theater ballistic missiles. “We got a 300 percent increase in search volume and the ability to operate in three environments,” he says.

The bulk of test flights remaining focus on the cooperative engagement capability, a high-reliability, low-latency communications link allowing ships and aircraft to exchange radar data and enabling the E-2D to be part of the planned naval integrated fire control-counter air capability. By allowing the E-2D to share its radar data from aloft, cooperative engagement capability will enable a ship to engage low-flying targets below the horizon of its radar using the SM-6 missile.

Deliveries of the first two low-rate initial production lots totaling five aircraft begin this year.

Profile *report*

This article originally appeared in the January 31 issue of *Space News* and has been reprinted here with permission.

Real Education Through Virtual Exploration

Jan. 28 marked the 25th anniversary of what at the time was the worst accident in the history of U.S. human spaceflight: Seven astronauts lost their lives when the Space Shuttle Challenger exploded shortly after liftoff.

Students across the country were tuned in to the ill-fated launch of Challenger's STS-51L mission because one of the crew members was high school teacher Christa McAuliffe, the first to fly as part of NASA's Teacher in Space Project. The aim of the initiative was to use the space shuttle program as a means to stimulate student interest in so-called STEM disciplines — science, technology, engineering and mathematics.

In the wake of the tragedy, the families of the fallen astronauts banded together to create the Challenger Center for Space Science Education. Its mission: Follow through on Challenger's educational objective by giving students the opportunity to participate in simulated space missions both as explorers and as ground-based controllers.

These computerized mission simulations are conducted at regional centers that typically are housed in museums or college campuses. Today there are 48 such centers, all but three of which are in the United States. The three non-U.S. centers are in Canada, the United Kingdom and South Korea, but plans call for expansion into Poland, Norway and perhaps India.

Some 4 million students have been through the program since 1986, and in recent years the annual average has been about 400,000. Scott Parazynski, a NASA astronaut and medical doctor who took over in November as chairman of the center's board of directors, wants to increase that number to 4 million per year by 2015.

Parazynski, who also has the distinction of having scaled Mount Everest, spoke recently with Space News Editor Warren Ferster.

What kinds of roles do students play in your mission simulations?

They have very specific roles that they take ownership of and then about halfway through the mission they'll actually switch positions with their counterparts; if they were in mission control, they'll jump into the spacecraft, and the folks that had been in deep space will come and run the rest of the mission in

mission control. They're developing teamwork, they're learning about different facets of science, there are medical officers, there are rendezvous and navigation officers, flight directors and so on. Kids will assemble a satellite probe as part of their mission; there will be various malfunctions that occur during their experience that they have to work through as a team.

How have the simulations evolved since 1986?

Initially it was fundamentally a shuttle simulation and kids would come in and fly the STS-51L mission to completion. We've expanded our mission scenarios to include missions to the Moon and Mars, and our ambition is quite substantial. We'd like to have undersea missions, polar exploration, even convert our simulations into a microbot that would allow kids to navigate a medical robot inside the body.

The other element that we're trying to assure kids is that there's a real future for them in space. So we're very excited about this new era of commercial spaceflight and we're starting to have a dialog with commercial spaceflight providers to demonstrate that we can actually do simulations in different types of spacecraft, different types of mission controls and really reinforce the fact that space is forever; it's in kids' futures.

What kind of preparation do the students undergo for a simulation?

The prep work starts weeks in advance. Typically in a space science block they'll have materials made available to their teachers; oftentimes teachers will come in for special missions prior to their classes, even going through the program. Then they'll come in and conduct their mission, and we have additional follow-on materials available to them online and in print.

What are your primary sources of funding?

We have a \$1 million-a-year congressionally mandated allotment, an endowment that was established in the aftermath of the Challenger accident. That provides our basic operating costs. Of course it costs a little bit more than that to run an organization these days, but that is a good chunk of what we need to operate at the national level. We have 48 learning centers around the country, each of which has its own local budget. The national organization is responsible for keeping the network supported with new materials, updating the software

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Education from page 10

engine and growing the organization. So a lot of our growth comes from philanthropy, and we obviously have aerospace friends who have been very generous in their donations to our mission, and then we have a large number of private donors. We have people that have given what they can — from a dollar to \$100,000 — over the years.

What does it cost to establish a regional Challenger center?

The current brick-and-mortar simulation costs about \$850,000, and that includes everything from the displays and software to the consoles and the satellite probes and the microscopes and all the bells and whistles. Of course that has to be placed into a facility, which is a separate cost.

What are you doing to reach a greater number of underprivileged students?

One of the things we're aspiring to do is reduce the barriers to entry. So to help communities that might otherwise not have access to a learning center, we will develop virtual missions led by Challenger Center flight directors remotely, using a school's computer laboratory as an example. Alternatively, we also hope to bring in portable learning centers that we would truck in from a distant location. So we would have probably a couple of tractor trailers that would pull into the school's parking lot. You would have one that would be mission control perhaps; the other would be a spacecraft. The walls would be reconfigurable; you could set it up for all sorts of different types of missions, with flat screen displays and interfaces where kids could get into simulation mode.

When do you plan to have these capabilities available?

This is one of our primary goals in the next year, to prototype virtual and portable missions. And of course the basic infrastructure can be had very cheaply — the shipping containers that you see around the world are in great excess, so you can get those cheaply. Electronics have come down substantially as well, so we hope to, in the next few months, pending funding, start prototyping some of these simulators that we would then deploy around the country.

What other kinds of upgrades are you considering?

One of our biggest-ticket priorities right now is to develop a new Web engine to support all of our simulations and network. It's a substantial upgrade; it's a collaborative environment wherein various learning centers can contribute various aspects of the mission scenario and they can work together or

they can generate an entire mission and then share it across the Internet. So it's a very powerful tool and it's really the next stepping-stone to our growth.

Apollo was an inspiration for many who are in the space field today. Is it possible to recapture that in this day and age?

I think it's challenging, but I do think it's very possible. Certainly Apollo shaped my younger years and it led to the career that I finally achieved, but I think that there are a lot of distractions that compete for kids' time. Technology is everywhere whereas in Apollo it was more of an anomaly.

Does the extended state of limbo for the U.S. human spaceflight program pose a danger that the public will lose interest?

I don't think we stand to lose our schoolkids. Kids remain fascinated with space travel, and the more we hear about shuttle flights and then hopefully future exploration targets for NASA and of course commercial spaceflight coming on line, I think that'll all reinforce the sense in kids' minds that there could be a future for them in space as well.

I would say we've never had any challenge getting kids motivated for space once they've been in our simulations. Once they come to us they are as fired up as can be. I would actually turn it around and say that as our nation redefines its space program, the Challenger Center actually plays a vital role in keeping the spirit of exploration alive in our students. So I would say that we probably are helping keep that spirit of exploration alive as we're in this period of limbo.

So you don't think a five-year hiatus in U.S. human spaceflight capability poses any sort of threat to the Challenger Center's mission?

If I were to identify the threats to our organization I would probably not consider the doldrums of our current NASA space programs, but rather turn it towards the educational system in our country as a whole. One of the bigger threats that I see beyond the economy is just the tendency to teach towards standardized testing, and unless a particular subject matter is going to be on that grade level's standardized tests, it's hard to get certain teachers and certain school districts to see the value and take the time out to come to a learning center. And that is a real disservice because there's less emphasis then on problem solving and creative thinking; it's just about rote memorization and scoring as high as possible to meet the metrics that that particular grade level or school district has.

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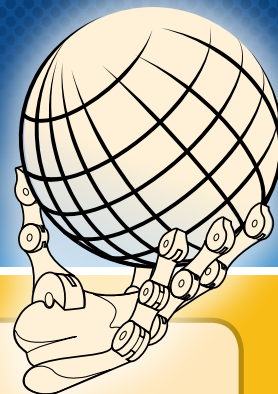
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