Training: The Foundation for Success in Combat

Jim Greer, Colonel, U.S. Army (Ret.)

In no other profession are the penalties for employing untrained personnel so appalling or so irrevocable as in the military.
—Douglas MacArthur, 1933

It is astounding what well-trained and dedicated Soldiers can accomplish in the face of death, fear, physical privation, and an enemy determined to kill them.
—Lieutenant General Ace Collins, 1978

Death, fear, physical privation, and an enemy determined to kill them: These are the challenges that those who defend our nation face when they go to war. Whether one is a soldier, sailor, airman, or Marine; a brand new private or a grizzled old veteran; a fighter pilot, a submariner, a tanker, a military policeman, a transporter, or a medic, every serviceman and woman must be prepared to make contact with the enemy, survive, and accomplish the mission as a member of the team. That is what training the Armed Forces of the United States is all about: enabling those who serve to fight, win, and come home to their loved ones.

Warfare is always changing, always evolving.

- World War II saw the emergence of blitzkrieg and air operations over land and sea.

- Vietnam demonstrated the power of combinations of enemy regular and insurgent forces.

- The ongoing campaigns in Iraq and Afghanistan have demonstrated how improvised explosive devices can be significant killers on the battlefield.

- In 2006, the Israeli Defense Forces were stymied by Hezbollah's employment of a hybrid approach that combined sophisticated conventional weapons and tactics with terrorism and long-range missiles.[1]

- Most recently, Russia has employed what is termed "New Generation Warfare" to conquer the Crimea, secure the eastern Ukraine, and threaten the Baltic nations.[2]

Military training must therefore change as well. It must continually be forward-thinking, innovative, and aggressive, both in understanding how warfare is evolving and in adapting training to meet those challenges. Today, the Chinese military presents the threat of long-range missiles to deny the U.S. access to the western Pacific Ocean and to our allies such as Japan, South Korea, and Australia. Since the end of World War II, the ability of the U.S. to move freely as it pleases in the Pacific has been assured, but that freedom of action is increasingly at risk as the Chinese military invests in new technologies and capabilities. This growing challenge places a training requirement on all four services to learn how to defeat the threat of such anti-access/area denial tactics.[3]

Training is one of the key functions of each of the services within the Department of Defense (DOD). Others include manning, equipping, organizing, and sustaining, but it is training that wraps all of those functions together to create and maintain effective organizations. Training is so important that each service has its own major subordinate command dedicated to training:

- The Training and Doctrine Command for the Army,[4]

- The Naval Education and Training Command for the Navy,[5]

- The Training and Education Command for the Marine Corps,[6] and

- The Air Education and Training Command for the Air Force.[7]

Each of these commands respectively holds the service responsibility for designing, developing, resourcing, assessing the effectiveness of, and providing command oversight of its service's program. Additionally, for the Joint Force, the Joint Staff J-7 has responsibility for joint oversight, policy, and strategy for training and exercises that bring individual service forces together into a coherent whole.[8]

What Is Training?

The U.S. military defines training as "instruction and applied exercises for acquiring and retaining knowledge, skills, abilities, and attitudes (KSAAs) necessary to complete specific tasks."[9] Generally speaking, military training is divided into two broad categories: individual and collective. Individual training is exactly that: training designed to develop individual skills. Collective training is designed to integrate trained individuals into a cohesive and effective team, whether that team is a tank crew of four or an aircraft carrier crew of 5,000.

Training can be as small as an hour-long class for a four-person team on how to bandage a wound and as large as a multi-week joint exercise including tens of thousands of personnel and units from all four services. It generally occurs in three domains: the institutional domain, which includes the various formal schools in each service; the operational domain, which includes training in units and on ships, whether at home station, deployed, or underway; and the self-development domain, conducted by individuals to address the gaps they see in their own learning.

Training Realism

Their exercises are unbloody battles, and their battles bloody exercises.
—Flavius Josephus, 75 C.E.

No other activity prepares a military force better for combat than combat itself. The environment in which combat is conducted—one of violence, death and destruction, fear and valor, complexity and uncertainty—is one of the most challenging in which any human being or human organization must operate. It is so challenging and unique that it cannot be completely replicated outside of combat itself. Thus, to be effective, military organizations must train under conditions that are as realistic as possible and come as close as possible to placing the individual, the team, the unit, and the crew in the environment and situations they will face in combat. Training realism is one of the key measures of training effectiveness.

Much of the design and innovation in training is aimed at generating realism. Training design generally has three components:

- The *task* itself—the thing an individual or the element is expected to accomplish. An example might be to conduct an attack, conduct resupply of a vessel, or employ electronic warfare to jam an enemy system.

- The *conditions*—the set of circumstances in which the task is expected to be performed. Examples might be day or night, moving or stationary, opposed by an enemy or unopposed, or with full capabilities or some capabilities degraded.

- The *standards*—the level of competence and effectiveness at which the task is expected to be accomplished. Standards might include the speed at which the task is to be performed, the accuracy of hitting a target, or the percentage of operational systems that are ready and available.

Identifying the tasks, conditions, and standards drives training realism. Ultimately, as Flavius Josephus described the training of the Roman army, the goal is for military forces entering combat to have "been there before" so that they know they can fight, win, and survive.

Training Effectiveness
It's not practice that makes perfect; rather, it's perfect practice that makes perfect. It is, after all, the seemingly small disciplines and commitment to high standards that makes us who we are and binds us together as a force, an Army, in peace and in war.
                    —General Martin Dempsey, 2009

As former Chairman of the Joint Chiefs of Staff General Marty Dempsey's quote implies, the services do not train just for training's sake. They train in order to reach specific measurable levels of performance in specific tasks. Training, then, is both nested and progressive. It is nested because training in specific individual tasks is aggregated to enable training in small elements tasks, which in turn are aggregated into training in progressively larger organization tasks.

Take, for example, a carrier battle group. A carrier battle group consists typically of the carrier; several cruisers, frigates, or destroyers; and perhaps a submarine. On each of those ships, individual crewmembers, petty officers, and officers must be trained on their individual tasks. Those individuals then form teams such as a fire control party or an engineering team. Teams are then combined to make departments, such as the gunnery and engineering departments, which then train together to create an overall crew for the ship that is effective in sailing, attack, defense, or replenishment.

The various ships of the carrier battle group then train together to enable collective attack or defense by the group of ships. At the same time, individuals and organizations are trained progressively under increasingly challenging conditions to increasingly higher standards. All of this must then be assessed for competence and effectiveness.

Because training involves both individual and collective learning, the military uses the standard approach of the educational profession to develop and conduct training. This is known as the ADDIE approach:

- **A**ssess. Organizations assess their training to identify gaps in proficiency or determine new training requirements.

- **D**esign. Training is designed to overcome gaps or to improve proficiency under a variety of conditions.

- **D**evelop. Once designed, training is developed, coordinated, and resourced to enable execution.

- **I**mplement. Developed training is implemented to train the requisite individuals and organizations.

- **E**valuate. Once conducted, training is evaluated for its effectiveness. Individuals and elements are retrained until proficiency goals are achieved.

Training assessments are a critical factor in achieving training effectiveness. On the front end of the ADDIE process, such assessments identify gaps in the achievement of standards, which in turn leads to the design, development, and execution of training to achieve those standards. At the back end of the process, training is evaluated to determine whether standards were met and, if they were not, what further training needs to be conducted to achieve those standards.

The Department of Defense uses the Defense Readiness Reporting System (DRRS)[10]

to track readiness, to include training. Under DRRS, each service uses its own readiness reporting system to report training readiness on a monthly basis for all of the elements in its organization. This monthly assessment is used to guide training management to ensure that training is conducted to achieve readiness goals.

Training and Leader Development

Training and leader development are two military functions that go hand in hand. It is of little use to have personnel and units that are well trained if they are not also well led; conversely, the best leader can accomplish little with poorly trained troops. Of course, both training and leader development are forms of learning, and there is significant overlap between the two functions. Consequently, the services invest considerable effort in leader development.

Each service has a Professional Military Education (PME) program for commissioned officers, warrant officers, and non-commissioned officers (NCOs) or petty officers. There is also a Joint Professional Military Education (JPME) program to ensure that officers are qualified to integrate service components into joint headquarters and joint task forces. In each case, PME consists of a progressive series of schools that begin with pre-commissioning education in the military academies, Reserve Officers Training Corps,[11] Marine Corps Platoon Leaders Course, and various officer candidate schools. PME continues with basic, advanced, and specialty education. Each service has a staff college for mid-grade officers and a senior service college, or war college, for senior officers. JPME has a National Defense University system that officers and civilians from all services and partner departments and agencies attend.[12] Within each service, there are parallel PME systems for junior, mid-grade, and senior warrant officers and NCOs.

Leader development represents a significant investment by the Department of Defense. During a 20-year career, a leader is likely to spend between two and four full years in the various PME schools: between 10 and 20 percent of total time served. The investment is necessary because of the unique and complex features of the environment and conduct of warfare. Senior leaders always confront the tension between time in schools and time in operational units. During periods of intense deployment, such as the high points of the Iraq and Afghanistan campaigns in the mid-2000s, attendance at leader development schools is sometimes deferred. When this happens, however, leaders face a challenge: determining whether it is better to have an untrained person present in the unit or a vacancy in the unit while that person is being trained.

Historically, interwar periods—the years between major wars like the 1920s and 1930s between World War I and World War II—have been periods during which leader development flourished and innovation occurred. The military's war colleges, the highest level of leader development, were instituted during interwar periods. Similarly, all of the services' advanced schools, such as the Army's School of Advanced Military Studies, the Marine Corps' School of Advanced Warfare, and the Air Force's School of Advanced Airpower Studies, were started during the Cold War. Clearly, such innovation needs to take place in the post-9/11 environment of seemingly continuous warfare, but how this will happen has not been determined.

Initial Entry Training

Virtually all members of the armed services enter the profession at the ground-floor level. Whether they are recent high school graduates, graduates of a university or one of the service academies, or transitioning from another job or career, they are thrust into an organization whose culture, shaped by the demands of warfare, is significantly different from anything they have previously experienced. At the same time, they are confronted with a myriad of new tasks that they must learn in order to be valued members of the team.

Each of the services has an Initial Entry Training Program, generally divided into two phases: a basic phase, often called "basic" or

"boot camp," to develop the foundational skills required of everyone in that specific service and inculcate them into the culture of that service and a more advanced phase to develop specific skills for their chosen or assigned specialty, whether as an intelligence analyst, a dental hygienist, a mechanic, or an air defender.

Initial Entry Training is a significant undertaking. Each year, the U.S. Navy trains approximately 40,000 recruits at Great Lakes Naval Training Center,[13] and the U.S. Air Force trains approximately 35,000 in Basic Military Training at Lackland Air Force Base.[14] The Marine Corps trains approximately 20,000 recruits a year at Parris Island[15] and another 17,000 at San Diego.[16] The U.S. Army trains more than 80,000 recruits each year at Fort Jackson, South Carolina,[17] and three other major training installations. All told, DOD is conducting Initial Entry Training for almost 200,000 young men and women each year.

The design and resourcing of Initial Entry Training always present a challenge. Obviously, senior leaders would like to train new recruits to the maximum extent possible before those soldiers, sailors, airmen, or Marines join their units or their ships, but more training means more time, and each individual has enlisted in the military only for a certain period of time, usually three or four years. As a result, there is a trade-off between time spent in initial training and time spent actually serving in support of a mission.

Another consideration is the investment of more senior, experienced people who serve as the training cadre. The services rightly send their very best to be the first leader under whom a new recruit will serve, but that means that the best leaders, who are limited in number, are not always with the fighting forces.

Command and Staff Training

A central component of training military organizations and units is the training of commanders and staffs. Each of the services has dedicated training programs and resources for such training, which normally employs simulations because it would be wasteful to use large numbers of troops and equipment simply for staff training. Much of this training is aimed at planning, coordination during execution, and decision-making.

- The Army Mission Command Training Program trains the commanders and staffs of large units at the brigade, division, and corps levels.[18]

- The Marine Staff Training Program trains the senior commanders and staffs of Marine Air-Ground Task Forces.[19]

- The Red Flag Series of exercises at Nellis Air Force Base is the U.S. Air Force program for training the commanders and staffs of Expeditionary Air Force elements.[20]

- The U.S. Navy operates several different programs tied to its regional fleets. For example, Carrier Strike Group 15 is responsible for training the commanders and staffs of Pacific-based carrier battle groups, amphibious ready groups, and independent ships.[21]

Another key factor is the training of joint headquarters and joint staffs. U.S. military forces never fight simply as Army, Navy, Air Force, or Marine units. Even if a particular operation is predominantly in one domain, the execution is necessarily joint.

Since 9/11, for example, the U.S. has conducted military operations in Afghanistan. Afghanistan is entirely landlocked, and counterinsurgency and counterterrorism operations are conducted exclusively against targets on the ground, against an enemy with no navy and no air force. Yet U.S. military operations in Afghanistan have been completely joint as the Air Force has provided precision attack from the air, the Navy has provided electronic warfare and training for Afghan National Security Forces, and Marine Corps forces have conducted counterinsurgency operations in specific sectors within the country. In addition,

special operations forces from all four services have conducted sensitive missions throughout the war.

Previously, training of joint headquarters and staffs was conducted by U.S. Joint Forces Command (USJFCOM) under a comprehensive program that was not unlike the Mission Command Training Program conducted by the Army. However, in 2011, USJFCOM was disestablished, and a very robust capability was lost. Since then, joint staff training has been conducted by the services, by regional Combatant Commands, or to a limited extent by the Joint Staff. Thus far, because the ongoing campaigns in Iraq, Syria, and Afghanistan have not faced multidimensional enemies, the change has not had adverse consequences. However, as the Department of Defense focuses training and readiness on more capable potential enemies such as North Korea, Russia, China, or Iran, the lack of a robust joint training capability will increasingly be an issue.

Training Simulations

Simulators and simulations have a long history of enabling training for military forces. Simulators include capabilities that replicate actual systems in order to maximize training opportunities, reduce cost, promote safety, or preserve equipment for wartime use. Early examples were flight simulators that reproduced the cockpit, wings, and tail of an airplane in order to train pilots in the control, maneuvering, and reaction to emergencies on the ground before they took an airplane up in the air. Other simulators in use today recreate the entire bridge of a navy destroyer so that officers and petty officers can learn to maneuver, fight, and safeguard the ship under tactical conditions.[22]

Simulations enable the training of organizations by creating battlefields or operational environments. Early examples of simulations were tabletop war games in which maps recreated the terrain of a battlefield and markers were used to signify the various units of opposing sides. Participants would fight out battles for training in the art and science of warfare.

Today's simulations are far more sophisticated and often far more integrated. The military uses four general classes of simulation: live, constructive, virtual, and gaming. Each of these classes of simulation has a specific purpose and training audience, and two or more classes of simulations can be integrated to make training of individuals and units even more effective. The goal of much simulation research and development is not just to create the most effective individual simulation, but to create a true *integrated training environment* that combines all four classes to maximize training effectiveness.

- **Live simulations** are the training simulations that most closely represent training as historically conducted with individuals and units using real equipment in training environments that most closely reflect actual combat. This means using actual land, sea, air, space, or cyber terrain; actual weapons using either live or dummy/inert ammunition; and actual vehicles and other equipment, often against an enemy force that is also live and simulated by some portion of the U.S. military.

  For example, Red Flag exercises are live training simulations in which Air Force, Navy, and Marine Corps aircraft fight against an enemy portrayed by U.S. aircraft and crews that are trained specifically to represent various enemy capabilities. In a similar manner, Army and Marine Corps ground forces have Combat Training Centers (CTCs) at which large formations of thousands of troops and hundreds of armored and wheeled vehicles and weapons systems fight battles against a well-trained and well-equipped opposing force (OPFOR) and conduct large-scale live-fire training at distances and ranges that they would expect in actual combat.

- **Constructive simulations** are representations of military forces and operational environments, usually aimed at training

for large-scale combat involving whole naval fleets, Army Corps, Marine Divisions, or Air Force Wings, to include joint constructive simulations that combine forces from one or more of the services. Originally, constructive simulations were conducted using tabletop war games with pieces representing military units, but today, most constructive simulations are computer-based. Given the size of forces and the fidelity with which military units, ships, and aircraft can be represented, constructive simulations are usually used to train leaders and staffs.

- ***Virtual simulations*** are computer-based representations of individuals, teams, units, weapons systems, and other capabilities, usually with great fidelity to the operational environment (terrain, weather, urban areas, etc.) to include not only enemies, but also local populations. Virtual simulations are best suited to training individuals, teams, or small units. For example, Conduct of Fire Trainers (COFTs) are used to train individual tank or fighting vehicle crews, and Close Combat Tactical Trainers (CCTTs) are used to train platoon and company-size groupings of tanks or armored fighting vehicles. Virtual simulations have the virtue of training aircrews, ship's combat systems crews, and tank and fighting vehicles crews in many repetitions and situations—in other words, lots of practice—without the large costs for fuel, munitions, and maintenance and without the need for the large spaces that live training requires.

- ***Gaming*** is the newest class of training simulation. While war games have been used for centuries in the form of board games or tabletop games, the advent of computer gaming brought with it whole new opportunities. The military recognizes that digital games improve rapid decision-making, cognitive processes, and synchronization and integration of different systems and capabilities while providing almost countless variations of situations and complex problems with almost immediate feedback on performance. The military even uses games to educate new recruits about the military service they have chosen before they actually attend their Initial Entry Training.

Resourcing Training

When personnel are not actually engaged in combat, training dominates military activity in all four services on a daily basis. Soldiers, sailors, airmen, and Marines are trained from the first day they enter the armed forces until the last day of their service. Commanders at every level consider training for future combat and military operations to be one of their primary responsibilities. Institutionally, each service expends significant time, money, and personnel on generating, conducting, and sustaining the most effective training possible for individuals, teams, units, and organizations at every echelon. Failure to conduct such training or conducting training that does not attend to the harsh realities of war will likely lead to failure in battle.

Of all the training resources we have, time is the most precious. Military organizations start the year with 365 days, but with 104 weekend days and a dozen or so holidays, the start point is soon around 250 days. Then training has to compete with other critical events such as maintaining equipment, moving units from one place to another, personnel-related tasks such as medical checkups, and preparation for deployment.

Therefore, in a really good year, a unit might have six months of actual training time. Then commanders must manage that time. How much is devoted to individual training? How much is devoted to collective or unit training? How much is small-unit or individual ship or squadron training, and how much time is spent on large-scale training? How much is live training, and how much time is spent in simulators? Management of the training calendar becomes one of the most important leader tasks.

Providing adequate personnel for training is also a critical resourcing effort. Great training requires great trainers. The basic training that each service provides is only as good as the drill sergeants and other non-commissioned officers who are taken out of combat-ready units and provided to the training base. Similarly, professional military education at all levels requires dedicated and well-educated faculty, both uniformed and civilian. Senior leaders must make strategic decisions about the management of personnel to provide the best support to training while still ensuring that units and ships are adequately manned to go to war if necessary while meeting the needs of ongoing conflicts.

Of course, the most visible resource necessary for training is money. Money pays for all of these capabilities. It pays for training areas, ranges, training ammunition, and fuel. It pays for flight hours for training aircrews, for transporting units to and from training areas, and for the training simulations. The services also must pay for development of future training capabilities such as virtual, constructive, and gaming simulations and for modernization of training forces as the conflict environment and the threats and enemy change. Money also pays the personnel costs associated with training.

Training budgets are very complex across the Department of Defense. Part of the cost of training is contained in a unit's operations and maintenance budget. Other training costs are in infrastructure or base maintenance budgets. Others are found in modernization budgets as the services improve capabilities or field new systems. Some costs are related to pre-deployment training for units that are preparing to go into combat in places like Iraq or Afghanistan. Costs are also spread over several years, or "across the POM" (Program Objective Memorandum) as the five-year DOD budget planning cycle is termed. This means that some training costs are short-term, year-to-year, while others, such as the costs of building training infrastructure, are spread out over several years.

Resourcing training with enough money is a national endeavor, not just a military one. The Department of Defense, in conjunction with other federal departments and agencies, submits budgets to the Administration that include all of the various training requirements. The Administration submits that budget to Congress as part of its overall budget. Congress considers all of the training requirements and costs in crafting an appropriations bill, which eventually is subject to a vote, approved, and signed by the President. At the same time, the various states are developing and approving budgets that include their own defense-related training costs, such as for the Army and Air National Guards and state-level training areas and facilities. And every two years, when Americans vote, the readiness, modernization, and training of the military forces is a consideration.

In other words, military training is every American's business.

Conclusion

Warfare continues to change as new operational methods like hybrid warfare are combined with new technologies such as cyber, drones, and 3-D printing. Military training also must continue to change so that the U.S. military is prepared to confront emerging threats and potential enemies that are growing in strength and ambitions. Training innovation and training resourcing are critical to achieving new and better ways to train the force.

Ultimately, the goal of military training is to ensure that when the nation goes to war or engages in conflicts or military operations short of war, the armed forces of the United States will be able to accomplish strategic, operational, and tactical objectives. The ultimate goal of training is to win battles and engagements and to do so with the lowest cost in terms of national resources and with the lowest loss of life among those who have volunteered to fight to defend the nation.

Endnotes

1. David E. Johnson, *Hard Fighting: Israel in Lebanon and Gaza* (Santa Monica, CA: RAND Corporation, 2001), https://www.rand.org/pubs/monographs/MG1085.html (accessed May 23, 2018).

2. Janis Berzinš, "The New Generation of Russian Warfare," *Aspen Review*, Issue 03 (2014), https://www.aspen.review/article/2017/the-new-generation-of-russian-warfare/ (accessed May 3, 2018).

3. Dean Cheng, "The U.S. Needs an Integrated Approach to Counter China's Anti-Access/Area Denial Strategy," Heritage Foundation *Backgrounder* No. 2927, July 9, 2014, https://www.heritage.org/defense/report/the-us-needs-integrated-approach-counter-chinas-anti-accessarea-denial-strategy.

4. U.S. Army, Training and Doctrine Command Web site, http://tradoc.army.mil/index.asp (accessed May 23, 2018).

5. U.S. Navy, Naval Education and Training Command Web site, https://www.netc.navy.mil/ (accessed May 23, 2018).

6. U.S. Marine Corps, TECOM Training and Education Command Web site, http://www.tecom.marines.mil/ (accessed May 23, 2018).

7. U.S. Air Force, Air Education and Training Command Web site, http://www.aetc.af.mil/ (accessed May 23, 2018).

8. U.S. Department of Defense, Joint Chiefs of Staff, J7 Joint Force Development Web site, http://www.jcs.mil/Directorates/J7-Joint-Force-Development/ (accessed May 23, 2018).

9. U.S. Department of Defense, Joint Chiefs of Staff, "Joint Training Policy for the Armed Forces of the United States," Chairman of the Joint Chiefs of Staff Instruction No. 3500.01H, April 25, 2014, p. A-5, http://www.jcs.mil/Portals/36/Documents/Doctrine/training/cjcsi3500_01h.pdf?ver=2017-12-29-171241-630 (accessed May 23, 2018).

10. R. Derek Trunkey, "Implications of the Department of Defense Readiness Reporting System," Congressional Budget Office *Working Paper* No. 2013-03, May 2013, https://www.cbo.gov/sites/default/files/113th-congress-2013-2014/workingpaper/44127_DefenseReadiness_1.pdf (accessed May 23, 2018).

11. U.S. Department of Defense, "Today's Military: ROTC Programs," https://todaysmilitary.com/training/rotc (accessed May 23, 2018).

12. U.S. Department of Defense, National Defense University Web site, http://www.ndu.edu/ (accessed May 23, 2018).

13. U.S. Navy, Recruit Training Command Web site, http://www.bootcamp.navy.mil/ (accessed May 23, 2018).

14. U.S. Air Force, Air Force Basic Military Training Web site, http://www.basictraining.af.mil/ (accessed May 23, 2018).

15. U.S. Marine Corps, MCRD Parris Island Web site, http://www.mcrdpi.marines.mil/ (accessed May 23, 2018).

16. U.S. Marine Corps, Marine Corps Recruit Depot, Western Recruiting Region Web site, http://www.mcrdsd.marines.mil/ (accessed May 23, 2018).

17. U.S. Army, "Gateway to the Army: Initial Entry Training," https://www.gatewaytothearmy.org/fort-jackson/basic-training (accessed May 3, 2018).

18. U.S. Army, Combined Arms Center, Mission Command Training Program (MCTP) Web site, https://usacac.army.mil/organizations/cact/mctp (accessed May 23, 2018).

19. U.S. Marine Corps, MAGTF Staff Training Program Web site, http://www.tecom.marines.mil/Units/Directorates/MSTP.aspx (accessed May 23, 2018).

20. Fact Sheet, "414th Combat Training Squadron 'Red Flag,'" U.S. Air Force, Nellis Air Force Base, July 6, 2012, https://web.archive.org/web/20150918180334/http:/www.nellis.af.mil/library/factsheets/factsheet.asp?id=19160 (accessed May 23, 2018).

21. U.S. Navy, Commander, Carrier Strike Group Fifteen Web site, http://www.ccsg15.navy.mil/ (accessed May 23, 2018).

22. Sam LaGrone, "Navy Makes Training Simulation Based on Fatal USS Fitzgerald Collision," U.S. Naval Institute News, February 21, 2018, https://news.usni.org/2018/02/21/navy-makes-training-simulation-based-fatal-uss-fitzgerald-collision (May 23, 2018).