



The AEGIS Movement— An OPNAV Perspective

■ VICE ADMIRAL JAMES H. DOYLE, JR., USN (RET.)

It is often said that the transformational success of the AEGIS weapon system and AEGIS ships can be attributed in large part to the personal relationship between the top surface warfare leader in the Office of the Chief of Naval Operations and the top Project Manager in the Naval Sea Systems Command rather than the organizational structure or the wiring diagram that existed at the time in either command. Besides RADM Wayne E. Meyer, VADM James H. Doyle, Jr., the Deputy Chief of Naval Operations (CNO) for Surface Warfare (OP-03) from 1975 to 1980, perhaps more than any other Naval officer, is responsible for the success of AEGIS. This article gives some of his personal reflections and memories of his time as OP-03, and an account of the personal relationship that developed between Doyle and Meyer.

From 1966 to 1970, I commanded the nuclear-powered twin TERRIER surface-to-air missile Frigate USS BAINBRIDGE DLGN 25 (designated the cruiser CGN 25 in 1975). In April 21–28, 1969, during the Vietnam War, USS BAINBRIDGE visited Subic Bay in the Philippines for maintenance/R&R. With USS BAINBRIDGE flying the CO's absentee pennant (my wife and I were at Camp John Hay in Baguio), CAPT Wayne E. Meyer, Technical Director at NSMSES, Point Hueneme, CA, came aboard during that period and proceeded to inspect the TERRIER system, particularly to find out whether ships' force was properly conducting the daily system operability tests (DSOTs). The Weapons Officer reported to me that Meyer was upset with what he found and told the officers in no uncertain terms what must be done to correct the situation. Since my Rickover nuclear training demanded following proper written procedures, my reaction to both Meyer's visit and to Meyer himself, although we had never met, was very positive. I believe this event began a strong personal bond between us that endures to this day.

In 1973, when I was Commander Attack Carrier Group Two on board USS FORRESTAL, I met with Vice Chief of Naval Operations (CNO), ADM Worth Bagley in Rota, Spain. Bagley, the premier surface warfare officer at that time, discussed the challenges for the new surface warfare community and what needed to be done to arm surface warships with offensive and defensive capabilities. Bagley also mentioned that he was favorably impressed with Wayne E. Meyer's efforts in pressing forward on the AEGIS weapon system. I agreed and mentioned my previous experience with the Meyer inspection team and Meyer's insistence on strict adherence to missile system test schedules and procedures.

From my USS BAINBRIDGE experience, I was versed in the capabilities and limitations of the TERRIER missile system and its operational role in anti-air warfare as practiced in the Tonkin Gulf. When I became Commander Third Fleet in 1974, my staff and I were responsible for conducting war at sea exercises for carrier task groups deploying to the Seventh Fleet that

involved simulated attacks by Soviet BACKFIRE and BADGER missile-carrying aircraft. At that time, the operational procedure was to assign the CO or the Task Group Commander on the carrier the responsibility for controlling all warfare areas—Strike, Anti-Air Warfare (AAW), and Antisubmarine Warfare (ASW). On many occasions, we found this to be beyond the capabilities of the TGC due to limitations in experience, instrumentation, and the leadership span of control on the carrier.

To provide for realistic operations, my staff and I issued a Third Fleet TACNOTE, which became known as the Combined Warfare Commander doctrine that dispersed and assigned new responsibilities for the Strike, AAW, and ASW Warfare Commanders. The AAW Commander (AAWC) would be the CO (or flag officer) aboard the most experienced and capable surface-to-air missile ship. The ASWC would be a destroyer squadron commander located in the ASW OpCenter on board the carrier. Strike responsibility would be retained by the TGC or CO of the carrier. ADM Bill Small, who later became Vice CNO, followed enthusiastically with a similar TACNOTE to his Task Group.

In January 1975, as Commander Third Fleet, I was called back to Washington to sit on a flag selection board with distinguished aviators, submariners, and engineering duty officers. I was pleased to learn that Meyer was a candidate for selection and was indeed a strong, dedicated, resolute, and technically qualified EDO, experienced in naval weapons. He had demonstrated that capability in action over the years and during deliberations on important issues for the future Navy, and was selected for flag rank. During that visit, Chief of Naval Personnel James Watkins informed me that plans were in the mill to order me to the Pentagon to be the Deputy CNO for Surface Warfare, OP-03, relieving VADM Frank Price, who was retiring.

From my experience in surface-to-air missileery and as Commander Third Fleet, I had very definite ideas about what was required on surface

warships operationally to meet the air and missile threat, perform the duties of an AAWC, operate in a task group that conducts war at sea, and contribute to sea control. From my USS BAINBRIDGE operational experience with USS ENTERPRISE, commanded by an inspirational leader, CAPT James L. Holloway III, I had learned task group operations, and was looking forward to working for now CNO Admiral Holloway as his OP-03. In order to carry out my new responsibilities when reporting for duty on September 30, 1975, a surface warfare structure and staff that would work closely with the other CNO warfare Deputies and the Director for Program Planning had to be established. Surface ship and weapon system requirements, as well as surface warfare programs and budgets that would benefit the entire Navy when integrated with air and submarine programs, had to be formulated and developed. In surface warfare, strong leadership would be required in working with other Surface Warfare flag officers and the OP-03 staff in order to formulate plans and priorities and, at the same time, participate as a strong and informed Office of the Chief of Naval Operations (OPNAV) sponsor in all phases of execution. Most importantly, the surface warfare community had to resolve differences and speak with one voice on surface warfare programs and issues.

On reporting, I found the Navy and the surface warfare community faced with several major challenges. In shipbuilding, over a billion dollars in claims had been amassed against the Navy. Also, the fleet faced a severe crisis in its material condition and readiness for war. Regarding AEGIS, newly selected RADM Meyer was now the AEGIS Project Manager (PMS 403) with responsibility for AEGIS and STANDARD missile-2 (SM-2). Thus began a close, personal, day-to-day contact between us that involved frequent updates on AEGIS, SM-2, and OP-03, and we planned for how best to staff and integrate the leadership and technical structures of OPNAV and PMS 403. This dialogue also included the operational and technical planning for future AEGIS cruisers and destroyers.

Much of the claims situation was brought about by the flawed OSD Total Package Procurement (concept definition, contract formulation) mandate. Using this approach, the development, engineering, and shipbuilding of the LHAs and DD 963s were turned over to industry that only had the flexibility to satisfy broad performance goals in meeting requirements. This approach, plus fixed cost contracts, arbitrary schedules, unrealistic share lines, and speculative cost estimates, resulted in billions in claims and requests for equitable adjustments against the Navy. In addition, both the LHAs and the DD 963s fell behind schedule at Ingalls Shipbuilding Company. Not only were the ships late and overbudget, they also had other problems. Head of INSURV, RADM John Bulkeley (of World War II PT boat fame) and I were next door neighbors in the Navy Yard. Often, late at night, Bulkeley would return from ship trials and toss some piece of flawed equipment from an LHA or 963 on my front porch to remind me of the quality problems in the ships. One of my first tasks as OP-03, as directed by CNO Holloway, was to explain to SECDEF James Schlesinger why there were such huge claims and what the Navy was going to do about them. VADM Bob Gooding, COMNAVSEA, and I tried to explain to Schlesinger that the Navy had to make changes in the warfare capabilities of various ships in order to meet the changing threat, but that the Total Package Procurement contracts had the effect of putting industry in the driver's seat on ship requirements and characteristics in a long shipbuilding process—a role they could not fulfill. However, we stated that the Navy would take corrective action. Eventually, the Navy had to settle the shipbuilding claims at a substantial loss.

In the Naval Material Command (NAVMAT), RADM Meyer and the leadership were also faced with the INSURV reports, which were documenting, in detail, mission-degrading discrepancies during the acceptance trials of new construction ships. Ships were accepted with major waivers, and many were not ready to conduct prompt and sustained combat opera-

tions at sea or to deploy. Post-shakedown availabilities, a year after construction completion, practically became a second construction period to correct many of the discrepancies. Leadership and management, financing, and budget control were dispersed among several institutions with limited coordination. Hull construction dominated weapons and armaments development. The various equipments and elements were engineered, built, and supported as separate commodities. Combat systems, to the extent they could be labeled such, were wired together by the shipbuilders without qualified workers or adequate documentation, generally in the final year of ship construction. New, emerging computer programs were incomplete, with limited testing and very limited in-service support. The crew joined the ship shortly before commissioning with no active role in the builder's and acceptance trials. In short, there was no one person in charge in the Navy with the requisite authority, expertise, and resources to harness government and industry as a team to engineer and execute the shipbuilding program. Furthermore, combat systems were *not* a keystone of the process. In spite of all this, the Navy was faced with a real warfighting challenge that had been punctuated several years before by the attack on the Israeli destroyer EILAT. The Soviet Union was committing enormous resources into arming its forces with cruise missiles to stop our Navy. A healthy shipbuilding program was needed to build the cruisers and destroyers required to push back.

Meanwhile, while my staff and I were dealing with shipbuilding concerns, combat system engineering under Meyer began to mature with AEGIS tracking targets at the land-based Combat Systems Engineering Development Site (CSEDS) in Moorestown, NJ, which had been transferred to the Navy from the Air Force and modified to house a version of the AEGIS combat system representing a strike cruiser (CSGN). Meyer's team had already accomplished a number of notable events: AEGIS Engineering Development Model One had been installed in USS NORTON SOUND and had been firing

SM-1 and SM-2 missiles at various targets—including successful intercepts of a low-altitude supersonic TALOS, a high-altitude BQM-34A drone, a SEPTAR target boat in the surface-to-surface mode, and, on “Super Sunday,” two targets simultaneously. USS NORTON SOUND also participated in a fleet exercise during which AEGIS detected all targets presented.

However, accountability was still divided in Naval Sea Systems Command (NAVSEA) between the AEGIS weapon system Manager and the several Surface Ship Managers (one for cruisers, and another for destroyers). Progress on DDG 47, later designated CG 47 and named TICONDEROGA, was on dead center. Armed with a Flag officer study, Meyer and I went personally to ADM Mike Michaelis, Commander NAVMAT, for help. With a vision for the future, COMNAVMAT and COMNAVSEA made a landmark organizational decision, which established a single Project Office, and made it responsible for engineering, design, development, production, testing, introduction, and in-service support of all AEGIS combat systems and AEGIS ships, with the requisite control of the allocated budgets. The new post was named the AEGIS Shipbuilding Project, PMS 400. RADM Wayne E. Meyer was confirmed and appointed as the manager, reporting directly to COMNAVSEA. Concurrently with this decision, and as the OPNAV Sponsor, I centralized sponsor responsibility for DDG 47 in a Captain dual-hatted to both OP-03 (me) and PMS-400 (RADM Meyer). These decisions to establish a single Project Manager accountable for the key elements on the critical path to the ship, including the combat system, weapon system, ammunition, crews, and the ship, were critical in enabling a full system engineering approach. It also highlighted the continuing responsibility of the OPNAV sponsor in the acquisition process, especially when more and more operational decisions were to be embedded in computer programs.

Capitalizing on the lessons learned from the POLARIS Project, Naval Reactors, and the Special Navy Task Force for Surface Missile

Systems, Meyer quickly took charge, establishing responsibility and accountability, and vertically integrating along the critical path to DDG 47 and a new AEGIS fleet. The total system of people, parts, paper, and computer programs was defined. Critical functions were logically, physically, and managerially centralized. Teamwork was created among designers, engineers, trainers, logisticians, and shipbuilders. Laboratories and field stations were aligned with industry. Close communications were established with the shipbuilders and the combat system agent. AEGIS Area Commanders were established at key shipyards, industrial plants, land-based test sites, laboratories, computer program centers, training sites, and major combat systems engineering centers. Plans and budgets for in-service engineering teams were developed for lifetime support. The introduction of combat system baseline engineering, together with computer program development, system production and test, crew training, propulsion testing, hull construction, and ship integration and test, were all put in place. Contractual relationships were established between industry and the Navy to provide incentives and insure fairness. The contracts were competitively awarded with cost plus award fees. Finally, AEGIS Milestones of Eight were institutionalized: AEGIS System Light Off, Main Engine Light Off, Machinery, Combat Systems and Acceptance Trials, Commissioning, Battle Group Readiness, and War Readiness. These initiatives have been discussed in great detail elsewhere in this journal.

To bolster fleet introduction of the DDG 47 class (CG 47), the Chief of Naval Personnel, VADM Jim Watkins, and I as OP-03, established an integrated crew phasing plan, similar to nuclear-powered ships, which would enable ship's company to arrive early, train, and then operate the combat system in all tests and firings, including those during sea trials. As a result of this transformation in shipbuilding, strengthened infrastructure, innovative fleet introduction procedures, accountability, and system engineering, USS TICONDEROGA (CG 47) deployed to the battle line in Lebanon 9 months

after commissioning, in contrast to the 20–22 months typical of almost all new construction warships built since World War II.

AEGIS combat system crew training was a high priority with PMS 400 and me. The AEGIS CSEDS and AEGIS Production Test Centers were established to help train officers and crews to operate their equipment in technical and operational exercises, and to keep abreast of changes to the systems. Meyer and I made frequent visits together to CSEDS, one of which is shown in **Figure 1**, to participate with officers and crews in these technical and operational exercises, using live targets of opportunity from the crowded Northeast airway. This training was invaluable in implementing the operational cornerstones and deciding on the positions and functions of consoles and displays, and how they should be operated in AEGIS cruisers and destroyers. Together, we successfully resisted continuous efforts by various Chiefs of Naval Education and Training to take over AEGIS training, and its CSEDS schoolhouse, in an amorphous, unfocused Navy training structure. The warfighting problem we were focused on required a different approach. Teamwork was established among designers, engineers, trainers, logisticians, and shipbuilders, who now had to think and align their work operationally with both the ship and the fleet as the focus. Decisions were hammered out within the Navy to establish the AEGIS Computer Center and Education Center at NSWC, Dahlgren, VA, and the AEGIS Combat Systems Center at Wallops Island, VA, for lifetime engineering support and crew training. This institutionalized engineering and training complex was a critical part of the infrastructure required to support AEGIS cruisers and destroyers.

I believe the lessons from the Surface Missile System “get well” effort of the 1960s and two generations of building guided missile ships had now been learned, and corrective measures were taken, which resulted in the superb readiness of AEGIS warships. These lessons made it clear to us that the sophistication and complexity of an



Figure 1: Doyle and Meyer at the Combat Systems Engineering Development Site Ribbon Cutting, 1977

AEGIS combat system demanded accountability under technical leadership and a single, central direction in a project that integrated the development of the combat system with the construction of AEGIS warships. In such an environment, system engineering could flourish.

The many elements that make up system engineering in a successful project are reflected in the birth and maturation of PMS 400 under RADM Meyer. As the challenges of weapon system, combat system, and ship began to come under control, our staff began to address the challenge of improving the overall effectiveness of AEGIS Battle Groups, comprised of both AEGIS and non-AEGIS ships, supported by PATRIOT batteries ashore. Again we teamed to initiate the Battle Group AAW Coordination Program at the Johns Hopkins Applied Physics Laboratory, with the ultimate goals of providing the Battle Group with the new threat awareness of AEGIS, capitalizing on AEGIS to better fight the fleet, coordinate fires, and use our ammunition prudently. Concepts such as “Forward Pass” and “Cooperative Engagement Capability” grew out of this effort.

In OPNAV, one of my duties was to visit monthly the Prospective Commanding Officers (PCOs) Ship Engineering Course at the Atomic Energy Commission’s reactor site near Arco, ID, and talk to PCO major command aviators and surface officers about the importance of hands-on oversight of the engineering plant and adhering to procedures on board their commands. This

course was one of the many actions CNO Holmway, a superb aviator and surface officer, took to improve the material condition of the fleet as documented in his personal recollection *Aircraft Carriers at War*. Other actions had affected surface warfare detailing and training, including requiring a tour in an engineering department before assignment as CO of a surface ship and the assignment of top-running senior Surface Warfare Officers to nonnuclear carriers as chief engineers for 2-year tours. In this regard, in exercises and visits to carriers and surface warships while in COMTHIRDFLEET, I found conditions in many ships to be generally poor below decks. Line officer interest and emphasis was on operations and tactics, not the engineering spaces, except for certain exceptional COs who exercised strong leadership across the board. Even then, as mentioned earlier in my first experience with Meyer, the adherence to weapon DSOT procedures left much to be desired. As OP-03, I looked forward to visiting PCOs and lecturing line officers on engineering and returning to basic leadership in all shipboard areas. The actions by the CNO in restoring line professionalism and pride in ship's engineering soon began paying off in improving the material condition of the fleet. Casualty reports were declining, crew morale was improving, and there was a new respect and future for assignment and service in engineering billets at sea.

By the mid-1970s, various ship designs were in the mill to put AEGIS to sea, including backfitting the cruiser LONG BEACH, building a new strike cruiser, CSGN, or later a CGN 42. After changes in the new Carter Administration and long debates in the Congress, the final decision by the Congress was that the first AEGIS ship would be a nonnuclear destroyer, DDG 47, later redesignated the cruiser CG 47. I testified before the Congress in favor of conventional gas turbine propulsion in the lead AEGIS destroyer TICONDEROGA. In another session on the Hill, the Commander of the Naval Air Systems Command, Forrest Petersen, and I, both with operational nuclear power experience, testified against the new administration's proposal to

build three conventional aircraft carriers instead of two nuclear-propelled carriers. This proposal was the result of President Carter canceling the nuclear powered carrier CVN 71, which was later reinstated by the Congress. At this time, I, as OP-03, was responsible to prepare the Navy's shipbuilding budget with inputs from OP-02 and OP-05 and present it to committees in the Senate and the House. Thus, accompanied by the cognizant DCNO or his representative, my staff and I were involved in numerous hearings with Congressional members and their staffs. During this budget season, Meyer and his technical team were also involved in testifying on the AEGIS Shipbuilding Program and associated weapons. This also involved a great deal of liaison with the various Congressional staffs. We kept in close contact and, from this exposure, were able to coordinate all shipbuilding programs and important surface warship weapon programs—not just AEGIS. RADM Meyer always had a broad Naval focus and was never limited to just the project that he was assigned.

To keep pace with Meyer's efforts as PMS 400 to press on with getting AEGIS into the fleet, I was staffing my OPNAV team to function properly as an OPNAV program sponsor. I rallied the flag officers in the surface warfare community to speak with one voice and issued guidance on surface warfare plans and priorities. In addition, in 1977, at the commissioning of the CSEDS at Moorestown, I publicly declared that the number one priority for surface warfare was to get AEGIS cruisers and destroyers to sea in numbers. RADM Meyer, CAPT George Meinig, and I are shown touring CSEDS after the ribbon-cutting ceremony in **Figure 2**. Since, as OP-03, I was also responsible for other surface warfare programs including amphibious ships, mines, mine warfare ships, patrol craft, and mobile logistic forces, adjustments were necessary to meet the new number one priority.¹ However, although RCA had been awarded major contracts for

¹In all these efforts, I was supported by a dedicated and professional OP-03 staff who strengthened our shared vision and decisions by introducing a number of new operational initiatives.

CSEDS and the AEGIS weapon system, we believed the RCA program office at Moorestown was not receiving the necessary support from their corporate headquarters in funding and the priority necessary for AEGIS development, testing, and training. Meyer and I, supported by Anna Mae Seixas with briefing materials, traveled to New York and met with the CEO of RCA at his headquarters atop 30 Rockefeller Center to discuss the importance of the AEGIS Project. We explained the operational and strategic importance of the Navy and the need for AEGIS cruisers and destroyers in the fleet. We stressed the importance of the operational and technical cornerstones of the AEGIS weapon system and the concept of defense-in-depth. We left after an elaborate lunch in elegant surroundings, but not knowing whether we had made an impact. Shortly thereafter, however, RCA provided full support to its Moorestown Program Manager.

The Carter Administration presented several new challenges to AEGIS weapon system engineering and shipbuilding. The first was mounted by the new Assistant Secretary of the Navy for Research, Development, and Acquisition, Dr. David Mann. He declared that, based on his participation in land-based missile firing tests at the range on Kwajalein Island, there was equipment on the shelf at the Army weapons facility at Huntsville, AL, capable of performing the AEGIS mission and that his independent study would show how using that equipment could be done more effectively and at less cost. Meyer and his technical team thoroughly investigated both assertions and found that there was no equipment on the shelf useful to the AEGIS mission. Moreover, Dr. Mann's study was technically flawed and would not meet AEGIS operational cornerstones and fleet requirements. Armed with this information, I joined in a meeting between Dr. Mann and the new Under Secretary of Defense for Research and Development Dr. William Perry and refuted Dr. Mann's assertions, stating that development of the AEGIS weapon system was meeting all milestones and would be installed in TICONDEROGA on or ahead of schedule. Dr. Perry then acknowledged that the



Figure 2: Doyle, Meyer, and VADM Rowden Receiving a Presentation at the Combat Systems Engineering Development Site

AEGIS program should proceed as planned. Another new challenge to both the AEGIS weapon system and TICONDEROGA came under the broad category of “low observables” related to (1) the radar cross-section of the STANDARD Missile (SM) and its ability to detect enemy air-to-surface missiles and (2) the radar cross-section of the destroyer TICONDEROGA to avoid being detected by threatening air-to-surface missiles. Meyer and I decided that to assist in resolving the issues, I would convene a study headed up by Dr. Norman Augustine, Vice President of Operations for Martin Marietta, later Under Secretary of the Army. He would work with my OP-03 staff and Meyer's team in analyzing the “low observable” issues and making recommendations. The study found that the SM could effectively engage incoming hostile missiles. The study also concluded that TICONDEROGA's radar cross-sections were satisfactory and did not prevent the ship from performing the missions assigned. The study recommended that the development of both the SM and the destroyer should proceed as planned. The “low observables” issue did not go away but was raised again in 1982 during the sea trials of TICONDEROGA in conjunction with the “tip-over drill,” an allegation that the ship was overweight and unstable. Both issues were resolved, confirming the destroyer's ability to survive rough weather and perform all missions assigned.

In yet another, broader-based challenge, Dr. Eugene Fubini, Chairman of the Defense Science Board, a distinguished radar expert and former

Assistant Secretary of Defense for Research and Development, was tasked to conduct a study examining the vulnerability of surface warships, particularly aircraft carriers, to detection by means then highly classified. To insure that AEGIS cruisers and destroyers would be considered, Dr. Fubini took me for a “walk in the woods” to learn more about the highly classified means of detection. Dr. Fubini then decided, subject to CNO concurrence, that both ADM Ike Kidd, Chief of Naval Material, and I should serve on the study, which we did. I recall the study concluding that, whether or not aircraft carriers, cruisers, and destroyers could be detected under certain conditions, they could still perform all missions assigned and, operating in battle groups or independently, engage hostile forces at sea or ashore in all warfare areas.

Earlier in 1967, OSD had completed the Major Fleet Escort Study, a system analysis of a general war with the Soviet Union. It led OSD to direct that SPRUANCE class DD 963s be built as single mission ASW destroyers. My OPNAV staff was the program sponsor for the various systems called out for the 963s, including the SQS-23 sonar, SQR towed array, 2 Lamps III helicopters, HARPOON, 5”54 guns, ASROC, torpedoes, CIWS, and later TOMAHAWK. When the decision was made that the first AEGIS ship would be DDG 47, a nonnuclear destroyer built on a DD 963 hull, it was also decided that the lead ship would be equipped with those mission-compatible systems that were ready when AEGIS was ready. One critical weapon system considered for the new ship class was the long-range, surface-to-surface missile system TOMAHAWK, which could provide a significant new capability for the offensive operations replacing the 8” gun and companion guided projectile canceled by the new Administration. CNO ADM Holloway, together with the Joint Chiefs of Staff, vigorously supported TOMAHAWK development. In addition, Meyer and I were supporting CAPT Walter Locke in his efforts to develop a family of cruise missiles that included TOMAHAWK. While TOMAHAWK was being tested at sea by firings from the MK 41 Vertical

Launcher-equipped USS NORTON SOUND, we made plans to install MK 41 Vertical Launchers and TOMAHAWKs in USS BUNKER HILL, now redesignated a cruiser, CG 52, and subsequent cruisers of the new CG 47 class. That plan has long since been accomplished.

Capitalizing on the lessons learned in CSED Site exercises and their experience in anti-air warfare and battle group operations, Meyer and I, with our OP-03 and PMS 400 staffs, participated at the Applied Physics Laboratory, Johns Hopkins University, in determining the layout of TICONDEROGA’s Combat Information Center, including the location of the large screen displays. We decided that the screens would be located side by side so that they could be seen by both the ship Commanding Officer and the AAWC, also seated side by side. Thus, the CO and the AAWC could view real-time inputs from AEGIS combat system instrumentation and non-real-time inputs from the AEGIS Display Group according to the tactical situation and operational plans. Embarking the AAWC on board TICONDEROGA during her first deployment validated this unique setup by providing a continuous and precise coherent air picture for the battle group, thus revolutionizing air battle control and the AAW planning process. Combat air patrol requirements were markedly reduced and air targets were quickly sorted out, thus providing more flexibility for the air wing aboard the aircraft carrier.

In 1977, CNO Holloway reorganized the fleet into battle forces and battle groups. No longer would cruisers and destroyers be termed “escorts” for carriers. Carrier task groups would be called carrier battle groups consisting of the aircraft carrier and its air wing, together with cruisers, destroyers, and submarines operating in mutual support to conduct offensive and defensive operations in all warfare areas in support of national policies, as well as to perform the basic function of controlling the sea.

The new fleet organization, which gave cruisers and destroyers specific roles in the carrier battle

group, mandated that TICONDEROGA cruisers be armed as multimission, multiwarfare warships. This further provided the basis for building a new class of multimission, multiwarfare destroyers, since both cruisers and destroyers were required in the battle group to perform offensive and defensive functions. Armed with this agreement, in 1978, my staff and I proposed to the CNO, verbally and in several memos that described the AEGIS cruiser and destroyer requirements based on the new fleet organization and consistent with maritime force-level studies, that OP-03 conduct a study to define a battle force-capable surface combatant(s) (read destroyer). It would replace retiring CG 3/CG 16/CG 26 ships. We also proposed that both the DDG 2 upgrade and the FFG 7 frigate program be terminated, and the SPRUANCE single-mission destroyers be phased out. The proposal made it clear that replacement destroyers were needed as core surface ships of the battle group and that new technology, such as the AEGIS weapon system, now permitted more modern weapons, sensors, and C3 systems to be accommodated in destroyer-sized hulls. This set the stage for building both the CG 47 class cruisers and the DDG 47 class destroyers. I launched the study on a verbal approval from CNO Holloway and followed with a tasking memo stating that the first of the new battle force-capable surface combatants, nominally designated a DDX, would be included in the Fiscal Year 1984 POM shipbuilding plan. The study directive stated that the replacement(s), DDX(s), should meet the surface combatant (read cruiser and destroyer) requirements and complement the projected inventory of naval capability (air, surface, and submarine). The study was to assess the threat and the capabilities of surface combatants, define the DDX mission, and evaluate the capabilities, effectiveness, and costs of DDX alternatives. Also, the study was to coordinate with the Material Command and OPNAV, as appropriate.

Meyer and I decided that the study would be done in-house at the Naval Surface Warfare

Center at White Oak, MD, with a working group composed primarily of serving officers and civil servants from OPNAV and the Material Command, supported by various laboratories and warfare centers, and augmented by fleet personnel and contractors as necessary. The initial Study Director was RADM Fontaine, OP-32, but since he was also in charge of OP-03 POM development, he was permanently replaced by then CAPT Ted Parker, my Captain in charge of training and education, who had both operational and technical experience. RADM Meyer contributed CAPT Donald P. Roane, his own deputy, to help lead the study. He was also a very senior, experienced officer. Both Parker and Roane would later be promoted to Admiral. With Meyer and I serving as hands-on members of the Steering Committee, and the OP-03 and PMS 400 staffs heavily involved, Parker took charge and conducted a professional and thorough study in a superb manner.

In the study, various candidate AAW systems were analyzed, played in war games, and compared in all respects. In addition, then CAPT Hank Mustin, OP-35, and I decided that the long-range, surface-to-surface cruise missile TOMAHAWK should be used in a scenario to attack air defense sites, in order to reduce aircraft attrition. The scenario analysis showed that aircraft attrition was substantially reduced and this simulated employment of TOMAHAWK provided valuable ammunition to rebut the position of OSD Program Analysis and Evaluation that AEGIS cruisers and destroyers needed only the short-range HARPOON missile against surface targets and a 5" gun was sufficient for targets ashore.

In June 1979, the DDX Study Report was issued, recommending a new class of destroyers with the following characteristics:

- Long-range surface-to-surface missile system.
- AAW system based on AEGIS technology.
- Hull-mounted sonar and facilities for helicopter operations.

- Sustained speed of at least 29 knots.
- Endurance of at least 5000 NM at 18 knots.
- Higher levels of passive protection.

The study was briefed to the new CNO Thomas Hayward, who rejected the AEGIS combat system and the destroyer as unaffordable (over \$600M), and too large in size and displacement (over 6,000 tons). Meyer and I instructed the study group and NAVSEA to continue to work on the challenges presented by the CNO. Later investigations, including a panel headed by a flag officer, confirmed that the AEGIS combat system was the right system for DDX and that the requirement for the AEGIS capability at sea in numbers fully justified the additional cost, size, and displacement. The DDX classification was changed first to DDGX and then to the DDG 51 ARLEIGH BURKE class.

In the meantime, my OP-03 staff and I, with assistance from Presearch Inc., developed a surface ship force-level plan that allocated 27 AEGIS cruisers (two for each of the 12 carrier battle groups and one for each of three surface action groups) and 58 AEGIS DDGX destroyers distributed among the 12 carrier battle groups, three surface action groups, four amphibious ready groups, and the mobile logistic forces.

This was the first time that surface action groups, robust in AAW, Strike, and ASW, were formally introduced in a surface warfare force-level plan. The plan also pointed out the evolu-

tion of cruisers and destroyers in the US Navy and the historic and contemporary differences between cruisers and destroyers in roles, missions, and capability (cruisers are more heavily armed and instrumented than destroyers, but destroyers in numbers are the workhorses of the Surface Navy). This was important in making the case for building AEGIS cruisers and destroyers in concurrent shipbuilding plans and budgets. The surface ship force-level plan and the AEGIS cruiser and destroyer companion year-by-year shipbuilding plans were briefed to Vice CNO Jim Watkins, who enthusiastically approved. Thus, the Navy and the Surface Navy were ready with requirements and shipbuilding plans for implementation when the Reagan military build-up began in the early 1980s.

My close association with Wayne E. Meyer continued after I retired in September 1980. When I was consulting for the Johns Hopkins University Applied Physics Laboratory, he tasked me to conduct a study on what changes, if any, should be made in TICONDEROGA-class cruisers to provide for receiving and transmitting higher classification tactical intelligence. The study was completed and in due course, the capability was added. This was just a start. We have served on numerous panels and studies together since his retirement in 1985. Even today, I am one of the senior advisors on the Surface Warfare Capabilities Study for the 21st Century (SWCS-21), a study chartered by CNO Mullen, continued by CNO Roughead, and led by RADM Meyer. It has been a relationship that has enriched us both—and I believe the Navy has been the beneficiary.

Figure 3: Doyle and Meyer at Combat Systems Engineering Development Site Rededication Ceremony, May 16, 2008.



EDITOR'S NOTE

To honor VADM Doyle's contributions to AEGIS, the CSEDS Site in Moorestown was re-named the VADM James H. Doyle CSEDS. It was commissioned May 16, 2008, and once again Doyle and Meyer joined to carry on the AEGIS Movement. Both are shown in **Figure 3**. CAPT Kristian Biggs presents VADM Doyle with a photograph of the site bearing his name (**Figure 4**).

Author Biography

Vice Admiral James Henry Doyle, Jr., USN (Ret.), graduated from the Naval Academy in 1946. From 1950 to 1953, he attended George Washington University Law School and graduated with the degree of Juris Doctor with distinction under the Navy postgraduate program. He was admitted to the bar of the District of Columbia and California.

As a junior officer, he served in cruisers and destroyers, and then commanded three minesweepers and a destroyer. Following instruction in nuclear propulsion in 1965, he took command of the nuclear powered, guided missile cruiser USS BAINBRIDGE (CGN-25), a 4-year tour including three deployments to the Seventh Fleet during the Vietnam War, and the ship's first refueling.

As a flag officer, Admiral Doyle was Chief, International Negotiations Division, Joint Chiefs of Staff, involved in SALT 1 and Incidents at Sea negotiations with the Soviet Union, and represented the Joint Chiefs of Staff on the US Delegation to the Law of the Sea Conference. He commanded Cruiser-Destroyer Group TWELVE and deployed to the Sixth Fleet as Commander Attack Carrier Striking Group TWO embarked in USS FORRESTAL (CV 59). His last sea assignment was Commander Third Fleet from 1974 to 1975.

From 1975 to 1980, he was the Deputy CNO, Surface Warfare, with responsibility for the Navy's shipbuilding and surface ship programs, including surface warfare education and training. Specifically, he sponsored the development,



Figure 4:

CAPT Kristian Biggs Presents VADM Doyle with a Picture of the Site Bearing His Name

construction, and introduction of the AEGIS fleet of cruisers and destroyers (CG 47 class and DDG 51 class), and their associated combat systems.

Admiral Doyle was twice awarded the Distinguished Service Medal for exemplary service, first in international negotiations and then in surface warfare. He also holds two Legions of Merit and the Bronze Star.

After retiring in 1980, he has been an adviser to the Johns Hopkins University Applied Physics Laboratory, the National Defense Industrial Association, the US Naval War College and the Center for Oceans Law and Policy, University of Virginia. From 1982 to 1989, he taught International Law of the Sea at the National Law Center, George Washington University. He is currently a senior advisor to the SWCS.

Admiral Doyle is married to the former Jeanette Blair of Berkeley, California. They have two daughters, a son, five granddaughters, and a great granddaughter.