The Imperative of Nuclear Literacy in Military Education
Insights from the NSERC Nuclear Deterrence Staff Ride

By: Maj. Dave Fobar and Maj. Tyler Halbert

The Nuclear Science and Engineering Research Center (NSERC), a Defense Threat Reduction Agency (DTRA) office located at West Point, NY, annually sponsors a three-week Nuclear Deterrence Staff Ride for select upper-class cadets and midshipmen attending either the three United States (US) Service Academies or an Reserve Officers' Training Corps (ROTC) program. During that time, students undergo an innovative and immersive education on the critical role nuclear weapons serve within US strategic deterrence policy. The Nuclear Deterrence Staff Ride presents a series of lessons and site visits across the US, each one punctuated with senior leader engagements and hands-on technical discussions and demonstrations. These experiences promote a robust understanding of nuclear deterrence as a component of modern US military strategy, as well as justifying its current and future requirement. As such, the Nuclear Deterrence Staff Ride provides an important opportunity for sowing the seeds of nuclear literacy within the next generation of Joint Force officers, thereby helping DTRA to cultivate future military leaders possessing a greater awareness and appreciation for the breadth and scope of the US nuclear enterprise.

The Structure and Purpose of the Staff Ride

This past year marked a significant evolution in the structure of the Nuclear Deterrence Staff Ride, introducing a dual-path itinerary that broadened the scope of exposure for all participants. Traditionally, the Nuclear Deterrence Staff Ride focused on Department of Defense (DOD) delivery platforms. However, this iteration incorporated a parallel focus on the National Nuclear Security Administration (NNSA) design and manufacturing enterprise. This past summer, twenty future Joint Force military officers, drawn from a diverse mix of military academies and ROTC programs, were divided into two teams. One team focused on DOD sites and the other on Department of Energy (DoE) sites. This bifurcated approach enriched the student learning experience by providing a comprehensive view of both the operational and infrastructural requirements and challenges associated with modern nuclear deterrence.

The participants, representing various academic disciplines from Nuclear Engineering to Political Science, brought a broad range of perspectives to the Nuclear Deterrence Staff Ride. This diversity proved crucial, as the complexity surrounding nuclear deterrence encompasses technical, strategic, and policy dimensions. Thus, by engaging with both DOD and DoE components, as well as one another, the interns gained a holistic understanding and appreciation of the US nuclear enterprise, one that better prepared them to make informed decisions throughout their future military careers.

Building a Foundation in Nuclear Deterrence

The Nuclear Deterrence Staff Ride commenced at Kirtland Air Force Base (KAFB), leveraging the Defense Nuclear Weapons School to establish a foundational understanding of the US nuclear enterprise through formal classes on policy,

strategy, deterrence, delivery platforms, and weapons operation. Tours of the Nuclear Weapons Instructional Museum (NWIM) supplemented classes which provided a tangible context to the abstract classroom instruction. The NWIM offered a historical perspective on nuclear weapon development and the evolution of deterrence strategies, grounding the interns in the legacy and ongoing relevance of US nuclear deterrence. Prior to the commencement of these classes, students underwent a pre-assessment to measure their initial understanding of nuclear deterrence, policy, and strategy. Use of the pre-assessment helped establish a baseline for evaluating the educational impact of the Nuclear Deterrence Staff Ride.

During their time at KAFB, participants also visited the Trinity Test Site, where the first nuclear detonation occurred. This visit was particularly poignant, as it connected the theoretical discussions to the real-world implications and historical significance of nuclear weapons development. Tours of the Kirtland Underground Munitions Maintenance and Storage Complex, Manzano Mountain, and interactions with the 21st Explosive Ordnance Disposal and Sandia National Laboratories, provided a comprehensive view of the operational, logistical, and research and development aspects of the US nuclear enterprise.

Diverse Experiences Across DoE and DOD Sites

Following these experiences at KAFB, the students were divided into DoE and DOD teams to allow for more specialized learning experiences. The DoE team visited Los Alamos National Laboratory (LANL), Kansas City National Security Complex, Y-12 National Security Complex, Oak Ridge National Laboratory (ORNL), and Pantex Plant. At LANL, discussions with weapons design experts offered insights into strategic deterrence and the physics of nuclear weapons. Tours of LANL facilities, such as the Los Alamos Neutron Science Center, highlighted the ongoing research and stockpile stewardship efforts essential for maintaining a safe and reliable nuclear arsenal.

In Kansas City, the students learned about the manufacturing and testing of critical components, emphasizing the rigorous standards and safeguards

ABOVE: The DOD team at the outdoor Submarine Launched Balistic Missile display at Kings Bay, Georgia.

in place to ensure the functionality and security of US nuclear weapons. At Y-12 and ORNL, the group explored the processes involved in nuclear weapon manufacturing, uranium enrichment, and the operation of high-performance computing resources like Summit and Frontier, which are pivotal modeling and simulation tools for nuclear weapon development.

At the Pantex Plant, the final DoE team site visit, tours were conducted of the assembly and disassembly bays, as well as the high explosive manufacturing complex. These visits underscored the meticulous processes involved in handling special nuclear materials and the stringent safety protocols that govern these operations. Understanding the technical and procedural aspects of nuclear weapons manufacturing deepens student appreciation of the complexity and importance of maintaining the US nuclear arsenal.

Conversely, the DOD team explored the operational side of nuclear deterrence through visits to Naval Submarine Base Kings Bay (NSBKB), Whiteman Air Force Base (WAFB), US Strategic Command (USSTRATCOM), and Malmstrom Air Force Base (MAFB). At NSBKB, instruction and tours, including a visit to the Trident Training Facility and aboard the USS Wyoming, highlighted the role of ballistic missile submarines as the assured second-strike component of the US nuclear triad.

At WAFB, home to the B-2 Spirit bombers, the students received briefings on the visible and recallable component of the US nuclear triad, including the unique capabilities and mission profiles of these aircraft. Their discussions with senior officers provided insight into the strategic considerations and operational challenges of maintaining a credible bomber force. The tour of the weapons loading facility and interactions with Air Force Security Forces further illustrated the intricate logistics and robust security measures that underpin the bomber leg of the triad.

The student site visit to USSTRATCOM offered a comprehensive overview of the command and control structures that govern the US nuclear forces. Briefings on nuclear targeting, vulnerability assessments, and the role of the nuclear command, control, and communications highlighted the strategic and operational complexities of US nuclear deterrence. Interactions with senior leaders provided a strategic perspective on the challenges and imperatives of maintaining a credible deterrent in a dynamic global security environment.

At MAFB, the students toured missile silos and mission control units, gaining a firsthand understanding of the intercontinental ballistic missile component of the US nuclear triad. Lessons there on security and safeguards emphasized the critical importance of protecting these assets from various threats. These experiences collectively provided a comprehensive view of the

ABOVE: The entire cohort of students and mentors at the Department of Energy Headquarters, Washington, District of Columbia (DC).

infrastructure, operations, and strategic considerations that underpin the daily functioning of the most responsive component of the US nuclear deterrent.

Recombination and Cross-Pollination in Washington, D.C.

The Nuclear Deterrence Staff Ride culminated in Washington, DC, which facilitated the recombination of the DoE and DOD teams, allowing for cross-pollination of information and experiences. In DC, the students engaged in high-level discussions with senior military and civilian leaders, toured the Pentagon, participated in a tabletop exercise (TTX), which simulated various nuclear crises, and completed a post-assessment. These interactions and exercises not only reinforced the knowledge gained during the site visits, but they also highlighted the importance of interagency and DOD cooperation in maintaining and executing US nuclear deterrence strategies.

More specifically, the students toured the Pentagon, meeting with senior leaders such as Gen. Eric Smith, Commandant of the Marine Corps, and Lt. Gen. Laura Potter, Director of the Army Staff. These engagements provided a platform for students to ask questions and discuss the roles of different military branches in US strategic deterrence. The students gained insights into the broader strategic considerations that inform US national security decisions. The discussions also delved into the preparedness of the US Armed Forces for operations in a nuclear environment, underscoring the importance and multifaceted nature of US nuclear deterrence.

At the NNSA headquarters, the group engaged with senior leaders from NA-10 and NA-20, gaining insights into the policy and administrative aspects of the US nuclear enterprise. These discussions highlighted the collaborative efforts between the DoE and DOD in maintaining a credible deterrent and emphasized the importance of interagency coordination in addressing the complex challenges of global nuclear security.

A culminating TTX was conducted at the DTRA headquarters building, which presented the students with a series of realistic scenarios involving nuclear-armed adversaries. Tasked with developing potential courses of action to maintain or regain nuclear deterrence, the students were challenged with applying the knowledge and skills acquired during the Nuclear Deterrence Staff Ride to formulate reasonable strategic options. This exercise underscored the strategic and operational challenges of nuclear deterrence and highlighted the critical importance of well-informed decision-making in maintaining US national security.

The Strategic Imperative of Nuclear Literacy

The primary objective of the NSERC Nuclear Deterrence Staff Ride is to enhance the nuclear literacy of future Joint Force leaders. Given the evolving nature of global threats and the critical role of nuclear weapons in US strategic deterrence, it is imperative that military officers at all levels possess a fundamental understanding of US nuclear policy, nuclear deterrent, and nuclear enterprise. Therefore, the insights and experiences these students gained from the Nuclear Deterrence Staff Ride are critical to ensuring the next generation of Joint Force leaders possess the knowledge and understanding to prepare their units and make informed decisions that will shape the future of national security.

Nuclear deterrence is a complex and multifaceted concept that requires a thorough understanding of policy, strategy, technology, and operations. Therefore, the comprehensive nature of the Nuclear Deterrence Staff Ride ensures that participating future Joint Force officers develop a well-rounded perspective on these issues, preparing them to navigate the challenges of modern military leadership. Most importantly, however, by deliberately promoting nuclear literacy, the Nuclear Deterrence Staff Ride contributes meaningfully to the future preparedness of the US Armed Forces to operate and win on the nuclear battlefields of tomorrow, which itself enhances the effectiveness of the US nuclear deterrent.

Conclusion

In conclusion, the Nuclear Deterrence Staff Ride is a vital educational initiative that significantly contributes to the strategic preparedness of future Joint Force officers. By providing a comprehensive and immersive experience, the Nuclear Deterrence Staff Ride ensures that participants develop a thorough understanding of nuclear deterrence, from US policy and strategy to the operational and manufacturing processes. This knowledge is essential for maintaining a credible and effective nuclear deterrent,

underscoring the need for continued emphasis on nuclear education in military training programs.

Additionally, the expanded format of the Nuclear Deterrence Staff Ride, incorporating both DoE and DOD perspectives, enriches the overall learning experience and highlights the collaborative efforts required to sustain the US nuclear enterprise and US nuclear deterrence. To assess the impact of this program, students completed both pre- and post-assessments. The significant improvement in scores following the Staff Ride demonstrated the efficacy of the immersive, multi-disciplinary approach in enhancing nuclear literacy among participants.

As future military leaders, the attendees leave better equipped for future military conflicts, especially against those with nuclear arsenals or ambitions. The Nuclear Deterrence Staff Ride teaches and demonstrates the critical importance of nuclear literacy in modern military education and the ongoing commitment required to maintain a credible US nuclear deterrent. ■

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