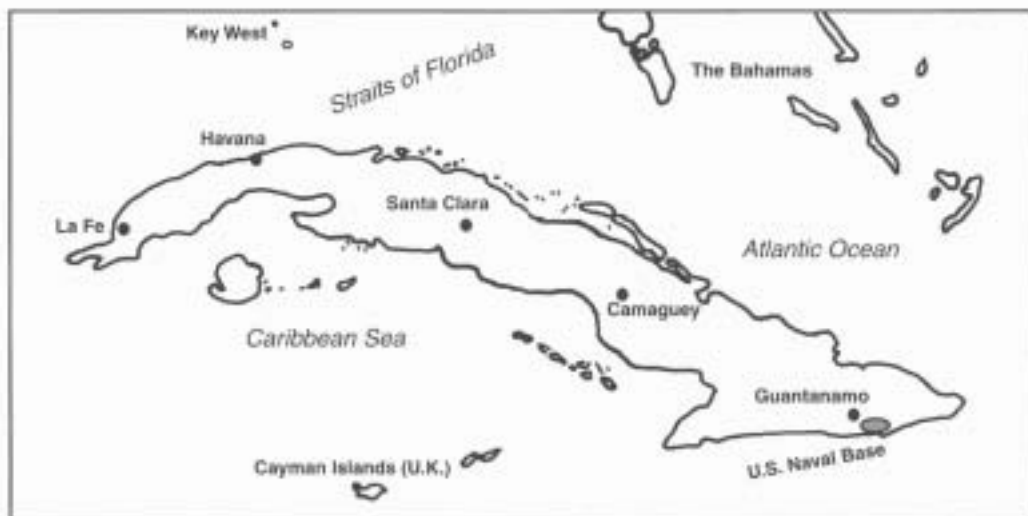




Guantanamo Bay:

Combat Engineering Don't "Gitmo" Better Than

By Captain Anthony J. Monaco, USMC

Commonly dubbed "Gitmo," the U. S. Navy's unique base on Cuba's southeastern coast has long been a showcase of naval expeditionary engineering capabilities. Originally seized by Marines as an advanced base for the Santiago Campaign of the Spanish-American War in 1898, Guantanamo Bay has been well used throughout the last century. The sheltered harbor, its position near the windward passage (an important maritime route between the United States and Central and South America), and its proximity to the Panama Canal make the base strategically important. Its airfields and extensive supply, repair, and training facilities make Gitmo an excellent forward-based naval facility. In 1961, though, the base was forced to turn its

focus inland after escalating tensions between the United States and the Cuban revolutionary government resulted in a serious threat to base security. In response to that threat, Gitmo severed all local ties, closed its gates, and assumed a defensive posture. Since then, Gitmo has been surrounded on three sides by a less-than-cordial neighbor—the Cuban Army's Guantanamo Division.

In this real-world setting, U. S. sailors and Marines, though vastly outnumbered by their potential adversaries, continue to prepare to impede a Cuban attack on the base. The tenuous defense has relied heavily on combat engineers to shape a maneuver-constrained battlefield and to protect the force from the direct- and indirect-fire advantage afforded



A Russian-made H1P8 helicopter patrols Gitmo's perimeter. A U.S. observation post is on the left and a U.S. minefield is in the foreground. Two Cuban observation posts are at the top of the hill.

the Cubans by their superior numbers and occupation of high ground around the base's perimeter. Along with providing a more credible defense, U.S. Navy and Marine counter mobility and survivability efforts at Gitmo have firmly established combat engineering's value as a combat multiplier. This article describes these combat engineering efforts and shows their arduous, occasionally ingenious, and at times costly development and integration into the defense. Some valuable lessons learned along the way are highlighted.

Weather, Terrain, and Obstacles

Gitmo is unique in the Caribbean in that it is not lush and tropical like nearby Jamaica and the Bahamas. Because of its seaside location, tropical heat and humidity are prevalent. Mountain ranges across Cuba's eastern end and mountains in Hispaniola block storms and rain, rendering the Guantanamo region semiarid. In most places, Gitmo resembles Arizona's desert more than it does a Caribbean island. Dense, gnarled chaparral, mangroves, and various scrub trees flourish in this climate. Because of the nearby ocean and intense tropical sun, the salt spray on vehicles, equipment, field fortifications, and obstacles is highly corrosive. There is no cool, dormant season to provide a break from the weather. High temperatures in the summer average in the mid- to high 90s, while winter highs average in the high 80s to low 90s. The temperature rarely drops below 70 degrees. Adding to its desert-like character is the lack of any naturally occurring freshwater source within four miles of the base.

Defenders usually pick terrain that affords them a distinct advantage over would-be attackers, but little about Gitmo's terrain favors the defense. From the island's eastern mountains and five key high points just outside the base, Cubans can view almost everything that occurs within Gitmo's fences. Terrain on the base is rugged and unwieldy due to the confluence of volcanic and coral geographies. Steep hills with loose, rocky slopes cover much of the base, although salt marshes and mangrove swamps also are common. Despite the relatively small amount of rainfall—an average of 23 inches per year—erosion control and soil stabilization are perpetual necessities on the many combat roads and trails in the defensive area. Even from the best positions on base, defenders must cover at least a dozen mechanized, small-unit avenues of approach that funnel into the base from concealed positions inside Cuba.

Several man-made obstacles and physical limitations further constrain American defenders. The first is the base's boundaries, which were set by treaty in 1934. The United States anticipated having to defend against an attack from the sea, so it took only the land needed for a coastal defense

of the base and harbor. The boundaries were drawn along straight north-south or east-west lines, often cutting directly over the top of key terrain features and stopping short of several prominent, and later tactically critical, hills and ridges. When the threat shifted inland, the boundaries drawn three decades earlier became an instant liability to the land-based defense. In 1983, Castro eliminated the possibility of Americans branching into Cuba to gain valuable maneuver space by seeding the Cuban side of the perimeter with thousands of landmines.

Another lasting effect of the treaty is that the base boundaries do not encompass the entire bay, merely the lower bay. The bay divides the naval base into two distinct sides, called *leeward* and *windward*. No bridges connect the two sides and travel between them is limited to boat and helicopter. The channel to the upper bay contains an important Cuban agricultural port and must, by treaty and international maritime law, remain open—at least during peacetime. The effects of this diplomatically imposed obstacle on maneuver and the defense are especially constraining.

In total, Gitmo's intense, difficult climate, coupled with its rugged, unforgiving terrain and vegetation are natural enemies. In the preparation and maintenance of a sound defense, these factors exact a heavy toll on both men and machines. At best, the terrain and weather are equally harsh to attacker and defender. At worst, adding the diplomatic foibles of yesteryear, they favor the attacker. He holds key terrain outside the base and can direct a multipronged attack through many avenues of approach to literally push the undermanned Marines and sailors into the bay from whence they came in 1898.

Developing a Defense, 1958-1964

The buildup of Gitmo's initial land-based defense corresponds with the rise in national-level tensions with Cuba and the general panic over the spread of communism in our backyard between 1958 and 1964. Before the late 1950s, the base had no well-delineated perimeter road, and its boundary was marked only by an unsubstantial picket fence. Marines occasionally patrolled the perimeter on horseback. Marine engineers conducted training at Gitmo but were not used or needed in its defense before this period. In June 1958, Castro's rebels elevated local tensions when they kidnapped a group of 28 Marines and sailors who were returning to the base from liberty in Guantanamo City. (They were returned in July 1958.) Castro officially claimed control of Cuba on 1 January 1959, and Cuban-American diplomatic relations plummeted until 4 January 1961, when President Eisenhower terminated them completely. In concert with this termination, the base closed its gates, began regular patrolling of the perimeter, and started work on its defense. The Bay of Pigs fiasco in April 1961, the Cuban Missile Crisis in October



General L.F. Chapman, Commandant of the Marine Corps, is briefed on Gitmo's defensive preparations in 1971.

1962, and various provocations by Castro's forces around Gitmo's perimeter during this period yielded an urgency to defense planning and preparations on the base.

The United States initially reacted to the tension threatening Gitmo in the early 1960s by throwing large numbers of combat and combat support troops into the fray. Although the naval base commander was responsible for defending the base's 17.4-mile perimeter, he exercised it through the commander of Ground Defense Force, a Marine colonel who was commanding officer of Gitmo's Marine Barracks. The force, equipped and manned to hold out for up to a week without reinforcements, was comprised of a regimental-sized infantry component augmented by several provisional Navy companies. It boasted an impressive array of combined arms—from Marine artillery, tank, antitank, and engineer units to Navy attack airplanes and gunfire platforms. A Seabee battalion dug in the force and created the initial field fortifications and revetments.

The initial defense reflected the prevalent tactical thought of the period. Navy and Marine planners deployed a large, static force in hold-at-all-cost positions along the entire perimeter and strengthened it with impressive firepower. Engineer efforts, always the most time-intensive on the battlefield, were limited because the defenders, aptly figuring on the inevitable Cuban attack, were only willing to gamble on a minimal amount of preparation before the defense needed to be set.

Field fortification construction and minefield emplacement topped the engineers' tasks. Marine infantry—trained and supervised by Marine engineers—installed protective, standard-pattern minefields during lulls in the tension. Everything about these initial minefield efforts reflected the urgency of the defensive situation. The minefields did not maximize use of the terrain or incorporate sufficient man-made, nonexplosive obstacles. Minefield records were hastily drawn and often incomplete. Probably

because of working long hours in the Cuban heat at a dangerous, unforgiving task, two junior Marines were killed in separate minefield accidents within a three-month period. As further evidence of the haste of these efforts, Marine Barracks staff members studying the continued requirement for landmines at Gitmo in late 1966 could find no record of the initial emplacement authority and few records on the initial efforts.

Changing the Focus, 1965-1966

As tensions around the perimeter relaxed about 1965, the American troops protecting Gitmo were slowly parceled out elsewhere. As American involvement in Southeast Asia grew, only a skeleton of the former force was left to defend against the still-credible Cuban threat. At this point, combat engineering earnestly entered the forefront of defensive preparations at the naval base. The new situation demanded that defenders make the best possible use of all combat multipliers. General Douglas MacArthur's prophecy began to be fully realized at Gitmo in 1965: "...It is certain that in future wars, even more than in the past, endeavors will be made by every possible means to prevent or delay the march of the enemy's troops by throwing obstacles in the way and by cutting such lines of communication as they might use."

The new defensive situation, featuring the tropical version of a Soviet-styled mechanized force, provided the impetus for a large-scale, combat-engineer-intensive defense retooling. The Marine Barracks exchanged its obsolete continuous perimeter defense for a mutually supporting strongpoint defense that relied heavily on an obstacle belt to disrupt, channel, or turn potential attackers. To effect this end, Marine engineer companies from Camp Lejeune, North Carolina, rotated to Gitmo in 1965 to plan and construct a more tactically sound obstacle belt around the perimeter. This retooling took more than a year of steady work to complete.

Engineer tasks were plentiful and the pace of implementation rapid. Seabees continued to assist the Marines with survivability efforts by fortifying strongpoints and artillery, mortar, and tank positions. They also expanded the network of combat roads and trails on rugged ground in and around the strongpoints, making reinforcement and maneuver between them more feasible.

Navy and Marine planners determined that landmine warfare was still a vital component of the Gitmo defense. They also recognized that the minefields emplaced from 1961 to 1962 were sorely in need of rehabilitation and better incorporation into a long-term defense plan. Marines removed or modified the minefields and emplaced several new ones. Guided this time by sound obstacle-employment principles and not nearly as hurried as their predecessors, the Marines tied 21 minefields, covering more than 600 acres of ground, into natural terrain obstacles such as salt marshes and steep hillsides. More than 41,000 M15 Heavy Antitank Mines, M14 "Toe Popper" Antipersonnel Mines, and M16 Bounding Fragmentation Antipersonnel Mines were used in these minefields. The Marines also built and incorporated substantial wire entanglements, tank ditches, and other nonexplosive obstacles into the obstacle belt. These efforts allowed the smaller, yet better-protected force to deploy behind a solid, well-planned, complex obstacle belt; fight a combined arms defense, albeit at closer range than desired; and reasonably expect to deter Cuban forces until help arrived from the United States.

Refining the Plan, 1967-Present

The Marine Barracks, later called the Marine Barracks Ground Defense/Security Force (GD/SF), continued to refine its defense plan. The more reasonable "live to fight another day" precept led the GD/SF to develop a delaying defense and abandon the outmoded "die-in-place" one. Along with the old strongpoints, this defense ultimately incorporated the more fluid concepts of battle positions, planned engagement areas, counterattacks, and phased fallback positions. The combined effects of this defense bought the time needed to evacuate noncombatants and allow reinforcements to build up in the rear area.

Refinements to the defense plan generated more engineer tasks. Though not in the numbers of the early and mid-1960s, Marine and Seabee engineer units continued to answer the call with regular deployments to the base, making the "smarter-not-harder" defense possible.

Field Fortifications

A prime focus for the deployed engineers was to maintain and upgrade the many field fortifications. Because of harsh environmental conditions, the fortifications—most of which relied on structural-grade timbers—had to be continually checked, repaired, and often rebuilt in order for them to

remain an effective part of the defense. The destructive effects of the omnipresent Cuban termites and carpenter ants compounded the situation. These pests destroy wood structures at an alarming rate. To combat their effects, Marines treated fortification timbers with thick applications of creosote.

Obstacle Belt

Marines and sailors continued to work together to maintain and improve the obstacle belt. The minefields remained the focus; Marine engineers and Navy corpsmen, ordnancemen, and explosive ordnance disposal technicians worked together daily in minefield rehabilitation operations. One of the more ingenious additions to the countermobility plan was the "Valley of Balls" reinforcing obstacle, the product of a Gitmo-unique recycling effort. From the early 1900s until the end of World War II, the entire Atlantic Fleet sailed to Guantanamo Bay for training and anchored throughout the bay. To accommodate this massive force, the Navy placed several hundred floating anchorages—large, steel spheres and cylinders—in the bay for ships to tie to. Once the fleet stopped deploying to Gitmo in large numbers after World War II, the Navy tried to rid the bay of the anchorages, which had outlived their usefulness and were hazardous to boat traffic. The solution was to use the anchorages as antivehicle obstacles. Placed in offsetting rows along vulnerable terrain—in this case two small valleys—the anchorages further strengthened the effort to deny attackers the use of key avenues of approach.

Observation Posts

Another sizable engineer task during this period showcases the well-known "can-do" motto of the Seabees. During their regular deployments, Seabees built 10 substantial timber-tower observation posts along the perimeter. Designed and built to withstand the effects of hurricane-force winds, these towers were significant undertakings. They were fitted with steel plating at the top to protect sentries from small-arms potshots from the other side. Placed on the highest ground available along the perimeter and usually standing about four stories high, the posts partially mitigated the American disadvantage in observation. The posts were crucial to the 24-hour surveillance of the perimeter. From these towers, guards could gain early warning of potential Cuban hostilities and constantly monitor daily activities of Cubans for later analysis by intelligence personnel. The towers also allowed Marines to effectively control the heavy influx of Cuban asylum seekers who came through the fence line in the early to mid-1990s.

Gitmo's Own Engineers

Early in 1968, the Marine Barracks received its own permanent combat engineer unit for rehabilitating the base's 700 acres of minefields. Called the Minefield Maintenance



Engineers upgrade the obstacle belt in 1997.

(MFM) Section, the unit included highly trained landmine warfare experts, all of whom held the rank of sergeant (E5) and above. The MFM Section relieved deploying Marine engineers of dangerous minefield work. Previous landmine operations had caused heavier-than-expected casualties to these units, claiming five lives and wounding several others between November 1965 and November 1966.

The MFM Section continued to upgrade and expand the minefields to better meet the needs of the defense plan, raising the total number of mines to more than 55,000, the total minefield acreage to more than 700, and the total number of minefields to 26. The MFM Section's daily efforts centered on locating and removing old mines and replacing them with newer, more effective ones, ensuring that Gitmo's minefields remained the highly effective backbone of the obstacle belt. One maintenance rotation, which involved removing and replacing all the mines and inspecting and repairing the infrastructure of each of 26 minefields, took seven years to complete. Between 1967 and 1990, minefield operations continued to provide a sober reminder of the price of maintaining Gitmo's defense. During this period, six more Marines and five Cuban fence jumpers were killed and several other personnel were injured.

Adding the MFM Section also provided the GD/SF with a combat engineer capability to supplement its battle plans. Their integration increased the plan's flexibility and resulted in the development of several unique, ready-made obstacles. The obstacles, positioned for rapid tactical employment throughout the base, did not prohibit normal traffic patterns or other routine occurrences.

The preplanned obstacles illustrated more of the combat engineers' innovative contributions to Gitmo's defense. Similar in concept and design to the obstacles employed by U.S. Army engineers in Korea and West Germany during the

Cold War, they included road craters and bridges that were prechambered for demolitions placement and falling blocks. Their construction emphasized quick, foolproof employment. The most prevalent of these obstacles were the prechambered road craters known as *blow holes*. Blow holes consisted of polyvinylchloride (PVC) pipe placed in the ground across the width of a road to maintain the holes into which cratering charges could be placed and ignited. The holes were tied together with a concrete cap, and metal lids were placed over the ends of the pipe. Everything was flush with the road surface. The prechambered bridges crossed antitank ditches, which were vital to the defense but obtrusive to the everyday business of perimeter surveillance. To blow the bridges and complete the obstacle, an MFM team would place predetermined quantities of demolitions in cradles welded to the underside of the bridge, tie the charges together, and fire the obstacle. In keeping with the foolproof use of these obstacles, instructions for blowing the bridge were stenciled on one of its abutments. The last of these obstacles were the falling blocks, called *monoliths*. Consisting of large concrete columns, they could be felled by a small "kicker" charge placed in a space at the bottom of each column. The columns would then fall inward and block the road.

The basic battle concept was for the MFM Section to be employed in mobile, four-man teams that served in general support of the GD/SF fight. The teams would be dispatched to initiate these obstacles at decisive junctures in the foreseen defensive battle, thus cutting off certain avenues of approach. This concept was especially important in Gitmo's shallow defensive area, because it allowed maximum use of the limited maneuver space for as long as possible and then quickly denied the enemy use of the same terrain as he pressed into the base. In case of a quicker-than-expected break in the lines, engineers could be employed as infantry—a bonus for the already lean defense force.

The Current Situation

Defensive operations at Gitmo have fallen to the same downsizing as the rest of America's military. Cuban forces around the base also have undergone changes, having lost their Soviet benefactor. However, the need for a credible defense has not dissolved and preparations continue, though on a more modest scale than in previous eras. Chief among these efforts—and one only recently completed—was the Seabee's repair and upgrade of the perimeter road. This road, the lifeline of the perimeter, had always been subject to damage from erosion and heavy tactical vehicle traffic. It was dangerous to drive on at night, the peak time for patrolling, and was badly in need of repair. The Seabees implemented a comprehensive plan to fix the problem that integrated soil stabilization, culverts, concrete ditches, gabions, and a double-bituminous, surface-treated road along the entire 17.4-mile

perimeter. The Seabees have also completed another timber observation post and started building several storm shelters along the fence line for Marine sentries and patrols.

Countermobility operations have taken the biggest hit recently. The president's decision in May 1996 to ban the use and stockpiling of all antipersonnel mines was manifested in a directive to completely remove Gitmo's minefields. The MFM Section is carrying out this operation, but the work is necessarily deliberate, slow, and thorough and is not scheduled for completion until after the year 2000. The GD/SF continues to search for a viable replacement for the minefields and is considering scatterable mine systems like the Volcano and the Modular Pack Mine System or perhaps a nonexplosive alternative. Survivability maintenance has been affected too, but recent developments from the Army's experiences in Bosnia show promising applications at Gitmo. Survivability and countermobility projects continue to accumulate because too few engineer units are available to accomplish all of the proposed projects.

Lessons Learned

The evolution of Guantanamo Bay's defense has yielded the following combat engineering lessons:

- ❑ *Integrate combat engineers into the defense.* This includes individual engineers on the ground who coordinate with infantry as well as engineer leaders who integrate engineers into operations plans. The Marines' experience at Gitmo clearly shows the value of a combat multiplier that is often not fully employed in peacetime exercises, because many combat engineering tasks are too time intensive to complete.
- ❑ *Keep combat engineers in general support of the force.* At Gitmo, the MFM Section showed that they were more flexible if they stayed in general support of the GD/SF during defensive exercises rather than be task organized to subordinate units.
- ❑ *Integrate engineer and fire-support planning.* This lesson is especially obvious at Gitmo, where Marines can stand on an obstacle, look down the avenue of approach it seeks to deny, and clearly see the desired combined-arms effect.
- ❑ *Stress the importance of realistic "hands-on" training for junior sailors and Marines, training which often is not possible in the United States.* Because the defense mission takes top priority in Gitmo, there are few constraints—environmental or otherwise—to hamper digging, building, demolishing, etc. The operational nature of the mission infuses defenders and those who have deployed to Gitmo with a singular focus and sense of purpose. The result is that generations of Marines and

sailors have taken valuable lessons learned at Gitmo to Vietnam, Beirut, the Persian Gulf, Somalia, and elsewhere.

- ❑ *Ensure that engineer leaders receive fire-support training.* Simulating the placement of demolitions in front of enemy and friendly lines when both sides are manning their positions—essentially working in "no man's land"—is a good way to remind everyone to brush up on call-for-fire and close air and radio communications skills.
- ❑ *Appreciate the difficulty, danger, and long-term consequences of minefield operations.* Conventional minefields require an incredible amount of resources and time to emplace and maintain. Minefields also present problems long after they have ceased to be tactically beneficial, regardless of the type of mine systems used. Friendly minefields produce casualties among even the most seasoned troops. These realistic considerations must be factored into our tactical planning.
- ❑ *Encourage innovation.* Some of Gitmo's most effective obstacles resulted from unlikely materials or bold ideas.
- ❑ *Stress simplicity.* Seemingly simple engineer tasks, such as priming a road crater or locating and removing mines from thick undergrowth, are not so simple when performed in view of an enemy guard tower. Working at Gitmo, with the nearby threat, shows how difficult it would be to do the same tasks in a combat situation.
- ❑ *Develop a unit standing operating procedure (SOP).* Although the MFM Section essentially followed established landmine warfare doctrine, the doctrine was by no means comprehensive enough by itself. The MFM Section found it necessary to develop thorough, stringent procedures for daily minefield operations. The use of the SOP by all Marines, regardless of rank, was undeniably a major factor in minimizing minefield casualties.
- ❑ *Minimize the potentially debilitating effects of terrain and weather on a defensive posture.* If not for a dedicated maintenance effort, there would no longer be any worthwhile positions or obstacles at Gitmo.
- ❑ *Emphasize the true relevance of the tenet "Every Marine a Rifleman."* The defense plan at Gitmo relies on the use of every Marine, regardless of specialty.

The Future

The defensive situation around the perimeter of the Guantanamo Bay Naval Base is one of only a few Cold War conflicts yet to be resolved. The future of the base and its defensive operations are currently unclear, and significant changes are likely as relations with Cuba

(Continued on page 32)

can use their Department of Defense Activity Address Code (DODAAC) to order digital and hard-copy products from NIMA on a 30-day turnaround cycle. As of 1 April 1998, NIMA products are ordered and delivered through the Defense Logistics Agency and requested by national stock number using the Standard Army Retail Supply System. Department of the Army Deputy Chief of Staff for Logistics message (DALO-SMP, DTG 140858Z April 97) provides instructions. Map stock and issue procedures follow AR 710-2, *Inventory Management Supply Policy Below the Wholesale Level*. Mapping, charting, and geodesy products are stocked at Class II, IV, and VII supply points at Corps and the Theater Army Area Command. The Defense Supply Center web site at http://www.dscr.dla.mil/PC9/dscr_maps.htm provides information on the new ordering and distribution process. All NIMA products are provided at no cost to support military requirements.

Joint Venture

The TerraBase II developmental effort continues as a joint venture between the Engineer School's Department of Training and Doctrine Development (responsible for all training, instructional materials, and training support), the Terrain Visualization Center (responsible for software development management, priorities, and field technical support), and the U.S. Naval Academy (responsible for programming and software development).

Engineer School personnel are grateful to Dr. Peter Guth of the U.S. Naval Academy for his extraordinary skill and dedication to this project and to the U.S. Naval Academy for its flexibility and support of Dr. Guth's efforts. This relationship allows TerraBase II to develop and respond quickly to user feedback. TerraBase II, version 3.0, is indicative of this cooperative relationship.

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(Continued from page 29)

continue to improve. That the defense has never been compromised, despite occasionally fierce posturing throughout nearly four decades, is testament to the resolve and skill of its defenders. Gitmo's tangible, unique defensive preparations, which showcase the competence and ingenuity of Marine engineers and Seabees, have shown that combat engineering is essential to mission success.



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