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Risk and Responsibility

Managing Future Iranian Weapons of Mass Destruction Threats

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About the Defense Program

Over the past 15 years, CNAS has defined the future of U.S. defense strategy. Building on this legacy, the CNAS Defense Program team continues to develop high-level concepts and concrete recommendations to ensure U.S. military preeminence into the future and to reverse the erosion of U.S. military advantages vis-à-vis China and, to a lesser extent, Russia. Specific areas of study include great-power competition, developing a force structure and innovative operational concepts adapted for this more challenging era, and making hard choices to effect necessary change. This paper was created as part of the Gaming Lab at CNAS, a larger initiative led by the Defense Program that develops highly tailored unclassified games and exercises to help policymakers and other stakeholders gain critical insights into key national security problems.

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Executive Summary

Washington is reimagining its global role, leading the U.S. Department of Defense (DoD) to make difficult choices about priorities, resources, and risk to better address the long-term "pacing challenge" posed by China. To do so, the United States plans to accept risks in the Middle East and against future Iran threats. Iran's possession and potential use of weapons of mass destruction (WMDs)—specifically, its nuclear program, chemical weapons, and biological agents—pose the greatest threat to U.S. interests and Washington's ability to accept risk in the region. But how Iran might leverage WMDs to threaten U.S. interests and upend Washington's plans to make trade-offs in global responsibilities is unclear, while the risks of failing to address these challenges remain high. As a result, the DoD and its component organizations, such as the Defense Threat Reduction Agency (DTRA), must enhance their understanding of the threat posed by Iran's nuclear, chemical, and biological capabilities and the escalation dynamics surrounding Iranian WMDs during crisis and conflict. By doing so, the United States can better accept risk in the Middle East and revise its global priorities while still protecting core U.S. interests.

To improve the DoD's understanding of future Iranian WMD-related threats and escalation dynamics, the Gaming Lab at the Center for a New American Security (CNAS) conducted a series of three virtual strategic-operational tabletop exercises (TTXs) exploring future Iranian nuclear, chemical, and biological weapons use. The TTXs indicated that even if Iran acquires a nuclear weapon, the likelihood the regime will use it is low. Instead, the regime may be more likely to use chemical and biological weapons to escalate conflict. Moreover, there are significant asymmetries between American and Iranian views of conflict timelines, escalation redlines, and risk tolerance, all of which make it difficult to offer and signal credible ways to de-escalate a crisis. Differences between Washington's risk acceptance and that of its regional partners—Israel, in particular—further complicate U.S.-Iran interactions.

The TTXs aimed to enable the United States to identify where and how it might mitigate the risk it must accept to better marshal resources in support of the department's strategic guidance. Accepting greater risk against Iran and in the Middle East more broadly means shifting U.S. strategic priorities in the region. This shift has the potential to unsettle allies and partners, and may possibly embolden Iran in the near term, but such tough choices must be made if the United States wishes to prioritize other long-term threats that may be of greater impact to U.S. security, such as China.

The DoD and its component organizations, such as DTRA, must enhance their understanding of the threat posed by Iran's nuclear, chemical, and biological capabilities and the escalation dynamics surrounding Iranian WMD during crisis and conflict.

Introduction

The United States is at a critical juncture in its defense policy. An increasingly multipolar world has given rise to an array of challenges, leading the United States to reimagine its global role and pushing the U.S. Department of Defense (DoD) and its component organizations to make difficult choices about priorities, resources, and risk to meet current and future threats more effectively. Long-term competition with China stands at the forefront of these challenges, as Beijing's rapid military modernization and nuclear expansion threaten U.S. military dominance. But other threats in the form of Russia, an acute threat, nuclear-aspirant states such as Iran, and transnational threats such as COVID-19 and climate change also require attention.[1] Balancing global responsibilities with China as the "pacing challenge" while contending with constrained resources and attention is difficult. For the DoD to prioritize China and the Indo-Pacific region in its defense strategy, it will need to accept risk against other threats and in other regions.[2]

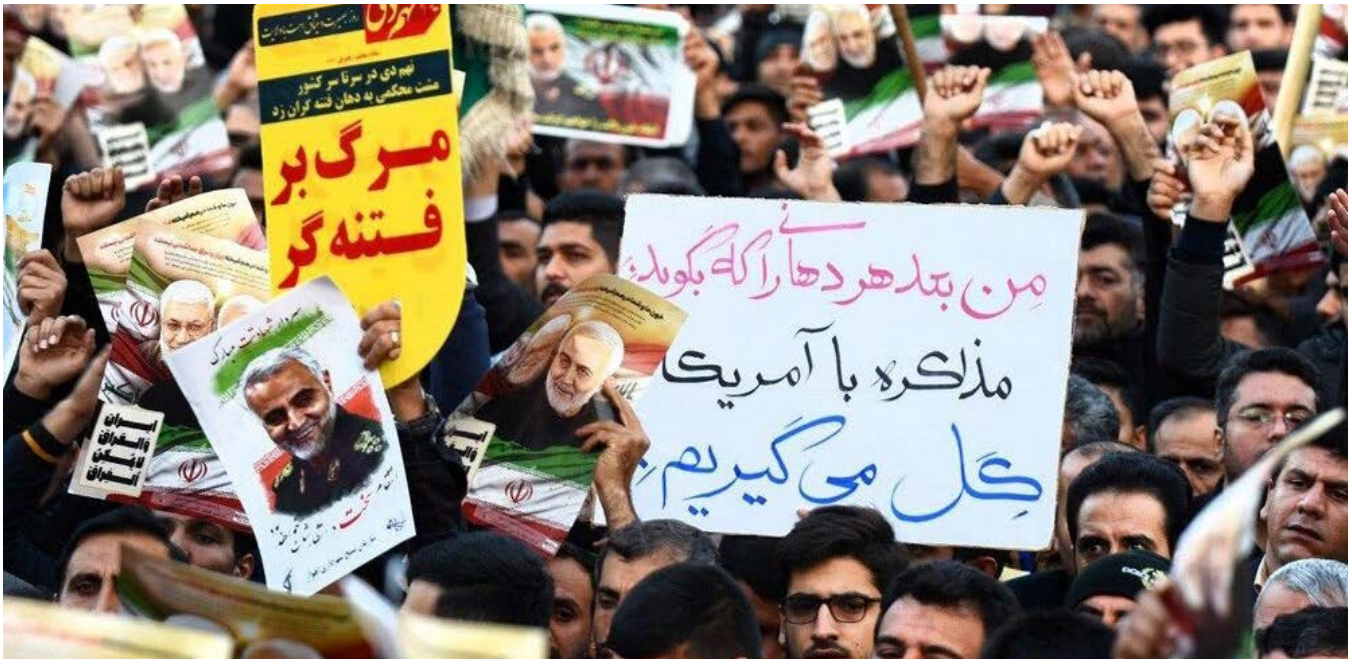
The *Interim National Security Strategic Guidance* and other strategic documents indicate that Washington plans to accept risk in the Middle East and against Iran.[3] Taking risk in the Middle East requires not only "rightsizing" U.S. presence in the region[4] but also hedging against potential Iranian conventional and nuclear aggression.[5] But in order for the United States to accept risk, it first must understand what the specific risks are. In addition to conventional and terrorism-related Iranian threats, Iranian weapons of mass destruction (WMDs—specifically, its nuclear program, chemical weapons, and biological agents[6]—pose a unique threat to U.S. interests. Therefore, developing an increased understanding of the potential future risks that Iranian WMDs pose is required for Washington to assess risk globally, identify where it can make trade-offs, and mitigate additional risk resulting from those trade-offs.[7]

Successive U.S. administrations have identified Iran as a national security challenge given its nuclear aspirations and continued support for militant groups targeting U.S. military forces and regional allies and partners.[8] Tehran has long developed asymmetric and nuclear capabilities to make up for its conventional inferiority vis-à-vis the United States, Israel, and other Middle Eastern states.[9] These include its pursuit of a nuclear capability; its building of a sizable arsenal of short-, medium-, and long-range ballistic and cruise missiles capable of carrying WMDs; and its network of nonstate armed groups that are supported by and allied with the Iranian regime.[10] Together, these capabilities give the Iranian regime the ability to strike adversaries by proxy with outward deniability and deter aggression against Iranian territory, all while imposing costs on the United States and its regional allies and partners.

Taking risk in the Middle East requires not only "rightsizing" U.S. presence in the region but also hedging against potential Iranian conventional and nuclear aggression.

Already, Iran has demonstrated its ability to threaten U.S. forces, undermine regional stability, and affect global commerce. In January 2020, Iran's Islamic Revolutionary Guard Corps (IRGC) precisely hit al-Asad Air Base in Iraq with more than 10 ballistic missiles in retaliation for the targeted killing of IRGC commander Qasem Soleimani, wounding several U.S. service members.[11] Similarly, in September 2019, the Iranian regime launched a drone and cruise missile attack on Saudi Aramco facilities in Abqaiq and Khurais to cripple global oil production.[12] Despite Iran's comparative conventional inferiority, these two examples demonstrate the advancement and sophistication of Iran's conventional capabilities, capacity to incorporate its proxy groups and new technologies into attacks, and ability to implement new tactics.[13] Rocket attacks on U.S. forces from Iranian-aligned militias continue almost daily in Iraq, while Iran's broad network of proxy groups continues to attack U.S. regional partners and advance Iran's use of gray zone tactics to achieve strategic aims.

Moreover, Iran's recent progress on its nuclear enrichment program has advanced its ability to produce weapons-grade uranium, reducing its timeline to develop a nuclear weapon and creating more uncertainty around the nature of its nuclear program.[14] As negotiations to return to the Joint Comprehensive Plan of Action (JCPOA) appear to be faltering, putting the brakes on Iran's program looks less likely and a nuclear-capable Iran appears to be a greater possibility.[15] Iran's history of chemical and biological programs was most alarming in the 1990s after the Iran-Iraq war. Credible assessments in the last decade or so are more mixed, with less information available.[16] The future threat that Iranian WMDs may pose is compounded by the nuclear program's trajectory; the country's continued possession of chemical and biological weapons; the growing level of complexity, accuracy, and sophistication of attacks; and Iran's expanding missile capabilities.



Iranian mourners hold up signs and portraits of Major General Qasem Soleimani at his funeral in January 2020 to protest his killing in an American drone strike. (Mohammad Hassan Hayavi/Wikimedia)

It is therefore imperative for the DoD, and in particular the Defense Threat Reduction Agency (DTRA), a DoD defense and combat support agency charged with countering and deterring WMD threats, to understand the potential threat posed by Iran's nuclear, chemical, and biological capabilities and the escalation dynamics surrounding Iranian WMDs during crisis and conflict. As the DoD is currently determining trade-offs in its global responsibilities, it is necessary for the department and its component organizations to understand Iran's potential thresholds for future WMD use to better recognize the circumstances that may merit a U.S. response and thus shift required resources and attention to the Middle East. Increased understanding of Iranian WMD thresholds will also help the DoD determine how it can effectively manage escalation and enhance deterrence in potential future scenarios in which Iran uses WMDs—including nuclear weapons. In so doing, the United States can better accept risk in the Middle East and revise its global priorities while still protecting core U.S. interests.[17]

To enhance DTRA's understanding of future Iranian WMD threats and improve the agency's ability to advocate a course of action to the DoD, interagency stakeholders, and U.S. allies and partners, the Gaming Lab at the CNAS conducted a series of three virtual strategic-operational tabletop exercises (TTXs) in the fall of 2021, using scenarios in which Iran possessed advanced nuclear, chemical, and biological capabilities. The TTXs aimed to enhance understanding of Iranian WMD threats and escalation dynamics to enable the United States to identify where and how it may mitigate the risk it must accept to better marshal resources in support of the department's strategic guidance. Several insights emerged from the TTX series that help inform why, when, and how Iran could employ WMDs in future scenarios to challenge U.S. interests and identify options for ways the United States can best manage this threat.

Increased understanding of Iranian WMD thresholds will also help the DoD determine how it can effectively manage escalation and enhance deterrence in potential future scenarios in which Iran uses WMDs—including nuclear weapons.

This report first provides a brief overview of the TTX series. Next, it details insights about future Iranian WMD threats and escalation derived from the three TTXs. It concludes with recommendations drawn from these insights, aimed at improving DTRA's understanding of the risks related to future Iranian WMD as well as its ability to advocate for DoD and whole-of-government strategies that appropriately address and mitigate such risks.

About the TTXs

The Gaming Lab at CNAS designed and ran three virtual TTXs in the fall of 2021 to better understand how Iran might use or proliferate WMDs to counter U.S. interests, and the range of strategic options that the United States might choose to adopt to counter, deter, or de-escalate Iranian WMD-related threats. The TTXs integrated strategic-level decision-making with operational and tactical-level considerations. Each TTX featured a group of 20 participants from a variety of institutions and backgrounds. Participants included current and former U.S. government and military officials, and subject matter experts drawn from industry, academia, and the think tank community. The participants were purposefully assigned to either the United States (Blue) teams or Iran (Red) teams based on their area of expertise.

The TTXs examined three unique scenarios emphasizing future Iranian WMD threats, in each of which Iran possessed chemical, biological, and nuclear capabilities. The TTXs varied in timeframe, level of escalation, and the specific aspect of WMDs being examined. The first TTX scenario, set in 2026, focused on Iranian use of chemical weapons delivered by drone swarms targeting U.S. military facilities in the Middle East. The second TTX, set in 2028, examined the proliferation of WMD capabilities—specifically chemical and nuclear capabilities—from Iran to affiliated proxy groups. The third and final TTX was set in 2031 and explored the implications of Iranian opportunistic aggression involving WMDs in the Middle East while the United States and China were engaged in a conflict in the Indo-Pacific.

The team structure varied slightly in each TTX to accommodate different actors of relevance in each scenario. For example, the second TTX—which emphasized Iran's proxy network—bifurcated the Iran team to represent the different interests of the Iranian regime and proxy groups. The teams were encouraged to role-play and emulate the specific actors they were assigned in the TTXs while still seeking to fulfill their objectives and "win" in the conflict. Although role-playing is imperfect, it is one of the few available tools to examine decision-making and consider how and why leaders might act in future situations. A summary table of the TTXs and their key features is found in Table 1.

The teams were tasked with creating strategies to respond to the TTX scenarios in accordance with a set of objectives that reflected their specific interests and priorities. While these objectives varied in the TTXs, several remained constant.[18] The teams implemented their strategies by taking four diplomatic, informational, military, economic, and civil actions every turn, which represented one month of time. Players linked their actions to specific capabilities and targets and had to explain the intended effect. For example, a Red team could attack a U.S. base in Iraq (Target) with drones carrying sulfur mustard (Capability) in order to disrupt operations out of the base and raise the cost of U.S. deployments in the region (Intended Effect). The success or failure of these actions was determined by the CNAS team, leveraging subject matter knowledge about military operations, Iranian capabilities, and WMDs.

TABLE 1: TABLETOP EXERCISE BREAKDOWN

Time	2026		2028		2031	
Team Structure	**Blue** U.S. national security enterprise	**Red** Iranian regime + regional proxies	**Blue** U.S. national security enterprise	**Red** Iranian regime subteam / Iranian proxy subteam	**Blue** U.S. CENTCOM	**Red** Iranian regime + regional proxies
Scenario Focus	Iranian chemical and biological weapons proliferation and use		Involvement of Iranian-backed proxies in a U.S.-Iran WMD crisis		Iranian opportunistic aggression while the United States is fighting a conflict with China	
Red Team WMD Capabilities	Chemical and biological weapons and enough weapons-grade uranium to produce a few weapons		Chemical and biological weapons, three gun-type nuclear weapons, and enough weapons-grade uranium to produce six weapons		Small arsenal of nuclear, chemical, and biological weapons	

Analysis: Iranian WMDs Use and Escalation Dynamics

The TTX series explored how Iran might leverage WMDs in future scenarios and the escalation risks associated with confrontation between two nuclear-armed states. Two sets of insights emerged from the TTXs. The first group of insights focuses on Iran's use of WMDs; the second focuses on escalation dynamics between Iran and the United States. Where possible, the insights were cross-checked against international relations theory and real-world Iranian actions, drawn from history and recent events, to test their validity.

Rational Thresholds

If it were to acquire enough enriched uranium to develop and field nuclear weapons—anything ranging from gun-type weapons to a small arsenal of nuclear warheads—a nuclear-armed Iran would shift the regional balance of power in the Middle East, raise regional risks of nuclear proliferation, encourage Iranian adventurism and pursuit of regional hegemony, and increase the stakes of a potential U.S.-Iran conflict.[19] While such conditions would undoubtedly require U.S. attention and resources, two major contingencies would place a particularly significant burden on the U.S. military: Iranian use of a nuclear weapon against another state or a transfer of this capability to any of its proxies.

The TTX series suggests that Iran is unlikely to use nuclear weapons in a first strike against the United States directly or against U.S. regional allies and partners, except in dire situations involving U.S. boots on Iranian soil or a foreign attempt at regime change. Iran is equally unlikely to transfer a limited nuclear capability, such as an armed warhead, to militant groups in its proxy network while Tehran's nuclear weapons arsenal remains small. Because Iran's nuclear program is likely to remain under international scrutiny for several decades—the duration of the TTX timeframe—it is unlikely to undertake large-scale production of nuclear warheads or, therefore, possess a large stockpile.

Across the three TTXs, the Red teams were hesitant—if not outright averse—to using a nuclear weapon, and no Red team employed any. The Red teams perceived nuclear weapons use as an invitation for an in-kind response by the United States or Israel, and sought to avoid the destruction that would come with a nuclear strike. The hesitancy toward nuclear use may also reflect the limited nuclear capabilities represented in the series; a modest-sized stockpile of nuclear-ready weapons does not provide a secure second-strike capability of sufficient magnitude.[20]

Although the Blue teams conducted attacks on counterforce targets, in the form of conventional precision strikes and cyberattacks on Iranian weapons and nuclear architecture, these attacks did not wipe out or significantly roll back Iran's nuclear program.[21] Because the Red teams successfully took measures to protect their limited arsenals, they did not feel as though they were faced with a "use-it-or-lose-it" dilemma in the TTXs.[22] However, this does suggest a potential trigger point for Iran, should future conflict include successful strikes on nuclear sites or command and control nodes that threaten a limited stockpile.

> **Nuclear weapons would deter nuclear attacks against Iran or a conventional invasion of Iran, but in order for this situation to hold, Iran would need to secure its nuclear arsenal—leading to an emphasis on protection, rather than proliferation or use.**

Even as tensions escalated and the Red teams faced internal and external pressures that threatened their core interest of regime stability, such as the assassination of Iranian military and political leaders and domestic unrest, the Red teams continued to move further away from considering nuclear weapons use, brandishing, or proliferation as options. This finding reflects concern over the vulnerability of their small nuclear arsenals, which in turn led the Red teams to protect their limited capability and shy away from actions that could put their nuclear weapons at risk. It also underscores the importance of nuclear weapons in Iran's national security thinking: as a means to secure the Iranian regime and the country's territorial sovereignty, as well as to deter external aggression that threatens both.[23] In this view, nuclear weapons would deter nuclear attacks against Iran or a conventional invasion of Iran, but in order for this situation to hold, Iran would need to secure its nuclear arsenal—leading to an emphasis on protection, rather than proliferation or use.[24]

The TTX series also illustrated that Iran may have sufficient means in the future to impose costs on the United States and its regional partners without resorting to nuclear use or moving to full-fledged conflict. This insight suggests that Iran may not preemptively use or proliferate nuclear weapons to achieve its aims. Moreover, it indicates that the Iranian regime should be

thought of as a rational actor, rather than an irrational actor willing to use nuclear weapons. Instead, the regime benefits from some ambiguity about both its nuclear capabilities and the calculus by which it would decide to use said capabilities. Iran may also be better served by brandishing a nuclear weapon as a threat—although this would weaken the ambiguity surrounding its nuclear capabilities—or by leveraging asymmetric capabilities such as its proxy network. This aligns with the preference of the Red teams in the TTXs and a demonstrated real-world preference of the Iranian regime to opt for conventional and asymmetric options over nuclear weapons during escalatory crises, and for remaining under the threshold of war.

However, it is not enough for Iran to simply possess nuclear weapons; rather, it must credibly demonstrate that it would be willing to use nuclear weapons for deterrence to hold.[25] The TTXs suggest that Iran may prioritize the survivability of its small arsenal and may not be inclined toward a doctrine of first use following limited attacks that do not directly threaten regime stability. According to the Red teams, the agreed-upon threshold for nuclear use was American or Israeli ground forces on Iranian territory or credible foreign attempts at regime change. This insight provides insights into what Iran's nuclear doctrine may be: nuclear weapons use only in extreme circumstances such as conventional ground invasion, credible regime change attempt, or counter-force attacks against its limited nuclear arsenal.

The dynamics in the TTXs suggest that a future, nuclear-armed Iran should be viewed as a rational, rather than irrational, actor.[26] Iran should not be thought of as a unitary actor; its leadership dynamics are complex. That said, the TTXs showed that forces within the Red teams pushing for nuclear use could be moderated by equally strong forces advocating restraint. Although there are real-world dynamics that could alter this dynamic, it is likely to hold under the conditions examined in the TTX series. There is reason to suggest as much, because Iran's thresholds comport with those expressed by other states. For example, the United States has stated that it would use nuclear weapons in "extreme" circumstances involving nuclear attacks on the United States or its allies, or non-nuclear strategic attacks, such as attacks on U.S. and allied nuclear forces, command and control, and supporting architecture.[27] Similarly, the Democratic People's Republic of Korea (DPRK)—classified as a rogue regime along with Iran in the 2018 National Defense Strategy—possesses nuclear capabilities and has tested its nuclear weapons.[28] Despite a steady drumbeat of lower-level provocations and a willingness to be the first to employ nuclear weapons, the DPRK's clear redline is foreign invasion or decapitation strike.[29] As the Iranian nuclear doctrine seen in the TTXs indicates, the Red teams saw nuclear weapons as a tool of last resort. But in more extreme circumstances or armed with a larger nuclear stockpile, Iran might be more inclined to employ nuclear weapons to counter threats to regime survival—even in a first-strike capability.

Iran's continued building of nuclear reactors at its power plants, such as the Bushehr facility seen here in 2010, raises international concerns over its ambition and ability to produce a nuclear weapon. (IIPA via Getty Images)

Asymmetric Escalation

Even though Iranian nuclear use may be a low-probability scenario, other elements of WMD should remain a concern for U.S. planners. Indeed, the TTXs illustrated that Iran may seek to use chemical and biological weapons as an asymmetric form of escalation.

In two of the TTXs, the Red teams used chemical and biological weapons against U.S. forces and citizens by means of creative delivery mechanisms. Chemical and biological weapons were viewed as preferred tools for coercive diplomacy; their use signaled a willingness to impose costs on the United States. In one TTX, the Red team, leveraging proxies, used chemical weapons to demonstrate its ability and willingness to punish the United States and Israel. More

specifically, the Red team sought to target Blue interests with chemical weapons to discourage further Blue team attacks on Iranian military infrastructure and to protect Iran's single nuclear weapon. Implicit within this attack was the threat of further pain should the Blue team choose to continue its strikes, in line with a deterrence by punishment approach.[30] In another TTX, the Red team deployed biological weapons against U.S. citizens in a bid to terminate the conflict on favorable terms by causing enough pain, or threatening to cause enough pain, to make the Blue team capitulate.[31]

Iranian chemical or biological weapons use would complicate U.S. responses, because the United States would not respond in kind and would need to determine proportionality with other tools.

In both cases, the Red teams used chemical and biological weapons once—rather than repeatedly—because a single use was viewed as a significant escalation and therefore a sufficient signal to the Blue teams. Chemical and biological weapons are effectively prohibited under the Biological and Chemical Weapons Conventions.[32] Because most countries—including Iran—are party to these treaties, an international norm has emerged against their use.[33] Because of this taboo, any Iranian employment of chemical or biological capability would be viewed as a sharper escalation than one using conventional tools. Iran's own history suggests that using these capabilities would be perceived by current Iranian leadership as a purposeful escalation. Iraq's use of chemical weapons on Iran during the Iran-Iraq War has significantly shaped Iranian strategic culture and decision-making.[34] Moreover, Iran's complicity in Bashar al-Assad's chemical weapons attacks in Syria suggest that current Iranian leadership appears comfortable with the use of chemical weapons against adversaries—particularly if some level of deniability exists.[35]

The TTX series suggests that Iran views chemical and biological weapons as an asymmetric form of escalation. Iran's earlier use of chemical weapons occurred in symmetric manner, in response to Iraq's use of such weapons during the Iran-Iraq war.[36] But the United States does not possess chemical or biological weapons, in accordance with international law.[37] Iranian chemical or biological weapons use would complicate U.S. responses, because the United States would not respond in kind and would need to determine proportionality with other tools.[38] Thus Iran's strategy in such a case would align with its use of other asymmetric tools, such as its proxy network, to gradually escalate confrontations and would complicate U.S. decision-making. For example, in spring 2019, the regime utilized a mix of asymmetric and conventional proxy attacks that were difficult to attribute to gradually escalate the conflict and impose costs on the United States and its regional partners.[39]

That said, Iran's use of chemical and biological weapons should be differentiated from other asymmetric tools. These weapons—and any use of them—would signal a sharp escalation in response to the seriousness of the threat, from the perspective of Iranian leaders. As such, chemical and biological weapons use would be a purposeful escalation. In the TTXs, the Red teams believed there was an inherent threat in their use of chemical and biological weapons: if the Blue teams did not back down, nuclear use would be considered among the next steps to escalate further.[40]

A U.S. Army combat medic secures a casualty under a simulated chemical, biological, radiological, and nuclear attack exercise in August 2022. Iran may employ biological and chemical attacks against U.S. interest to escalate a crisis or send a signal to the United States and its allies in future conflicts. (Jesse Pilgrim/DoD)

Escalation Management and Risk Tolerance

Previous crises have demonstrated differing escalation approaches taken by Iran and the United States, including their methods of and rationale for escalating. Their divergent patterns of escalation have complicated efforts to effectively signal intent or consequence during confrontation. Such escalation dynamics would become riskier if both sides were nuclear armed, and particularly if Iran lacked a secure second-strike capability. The TTX series illustrated how the added complexity of nuclear weapons could exacerbate the critical differences in American and Iranian approaches to escalation management.

Both the Blue and Red teams felt pressured to respond to the other's actions, even if the response diverted away from their respective theories of victory.[41] Both teams pursued theories of victory throughout the TTXs that seemingly failed to influence the other side's calculations about escalation in a beneficial fashion. This led the Red and Blue teams to demonstrate divergent patterns of escalation.

For the most part, the Blue teams approached escalation cautiously, shying away from escalation even when it might have been needed to achieve their goals. This risk aversion may reflect the teams' belief that the Middle East was an "economy of force" mission, particularly in the third TTX.[42] The Blue teams did use limited conventional military force, but they preferred to use diplomacy, demonstrations of force, and cyberattacks to deter the Red teams from conventional and WMD aggression—all tools for which Washington has demonstrated a real-world preference during tensions with Iran.[43] From the perspective of Blue players, they could leverage alternative forms of power and use force conservatively because their military superiority provided them with escalation dominance.[44] Such actions had varying degrees of influence on the Red teams but largely failed to deter the Red teams from further escalation and aggression.

The Blue teams' careful responses were intended not to invoke significant reactions from the Red teams, because they feared escalation going beyond their control and were not willing to risk it. This was particularly true in the third TTX, where America's other global priorities factored heavily into the Blue team's risk calculations. This thinking led the Blue teams to fall into predictable patterns of behavior, emphasizing responsive strikes to counter Iranian aggression, including the Red team's use of chemical and biological weapons. Blue players argued that such predictability would help avoid miscalculation and enhance crisis stability.[45] However, these strikes failed to alter the status quo or change the calculus of their adversaries, and were in fact exploited by the Red participants, who could preempt Blue actions for a "first-mover" advantage.

Across the board, the Red teams were more willing to escalate. While they remained wary of inviting attacks on Iranian soil or directly on the regime, Red players saw provocative actions—whether mining the Bab el-Mandeb, using proxies to overrun the U.S. embassy in Baghdad, or publicly advancing the nuclear program—as intrinsic to achieving their interests and testing Blue teams' willingness to be dragged into retaliatory actions. A prevailing theme of the Red teams was that they felt the need to escalate to accomplish their strategic objectives and were generally confident that the Blue teams would look to de-escalate tensions by providing off-ramps rather than engaging more forcibly. To the Red teams, escalation and engaging in brinksmanship were the only ways to break out of tit-for-tat conventional exchanges with the United States and fundamentally alter the status quo.[46]

The TTXs demonstrated that in the future, a nuclear-armed Iran may have greater flexibility than the United States to escalate and may be more willing to accept risk.

The TTXs demonstrated that in the future, a nuclear-armed Iran may have greater flexibility than the United States to escalate and may be more willing to accept risk. Diminishing U.S. influence in the Middle East is central to the Iranian regime's objectives, and these asymmetric stakes mean Iran could expend greater time, attention, and resources to fighting the United States.[47] Iran's proxy network, an asymmetric tool it has perfected since the Iran-Iraq War to make up for its conventional military inferiority vis-à-vis the United States and Israel, also provides Tehran with greater flexibility to ratchet up tensions while purposefully remaining below thresholds that it believes would prompt a large-scale American conventional military response. Its use of proxies to carry out attacks produces ambiguity as to whether the attack was conducted by the regime or the proxy, thus providing Tehran with plausible deniability.[48] The addition of nuclear weapons is likely to further reinforce the regime's sense of security, highlighting the stability-instability paradox.[49] Iran's nuclear deterrent may embolden the regime because it may enhance leaders' perceptions of security, leading them to accept more risk and increasing their willingness to escalate because of the reduced chance of blowback from Washington.[50]

U.S. troops and media outlets inspect damages from the major Iranian missile attacks on al-Asad Air Base in January 2020, following months of tensions between Tehran and Washington and the assassination of Qasem Soleimani. (Derek Mustard/ DVIDS)

Incentives and Off-Ramps

A conventional conflict between two nuclear-armed states could escalate and result in nuclear use or nuclear war, highlighting the need to identify clear de-escalation mechanisms between the United States and Iran. In the TTXs, the two teams diverged in their perceptions of conflict timelines, which affected their willingness and urgency to end the conflict. The Red teams consistently felt as though time was on their side; they could withstand a protracted conflict given their domestic resilience, the assurance provided by nuclear capability, and the importance of countering the United States in its national security psyche. Moreover, they believed a "draw" could be claimed as a victory for an Iranian domestic audience because it denied U.S. objectives, in line with a narrative the Iranian regime shaped following tensions with the United States in early 2020.[51] The Red teams viewed a longer conflict as an opportunity to impose greater costs on the United States at a time when Washington was less invested in the region, thus pushing them to continue attacks—albeit slowly and under the threshold of war so as to not incite a response from Washington.[52] This perception not only led the Red teams to purposefully prolong the conflict but also introduced an unwillingness to seriously entertain Blue team off-ramps that fell short of their aims.

This stood in stark contrast to the Blue teams, which felt pressure to swiftly end a conflict with Iran to focus on other, more pressing global priorities such as the China challenge. This contrast highlights an asymmetry of stakes in a U.S.-Iran conflict: the confrontation may be existential for the Iranian regime but is merely a distraction from the real priorities for Washington. From the Blue teams' perspective, they held both military dominance and could choose to end the conflict, but at a high cost. Thus the Blue teams often moved away from escalating the conflict. They sought to diffuse the situation by identifying and providing off-ramps from conflict to the Red teams.

This contrast highlights an asymmetry of stakes in a U.S.-Iran conflict: the confrontation may be existential for the Iranian regime but is merely a distraction from the real priorities for Washington.

However, the Blue teams' off-ramps were consistently rejected by the Red teams in the TTXs. The Red teams did not view offers of negotiations or steps to de-escalate the crisis as credible options, in part because they felt the offers purposefully placed them at a disadvantage. The off-ramps lacked sufficient incentives for the Red teams to cease aggression, particularly because they viewed a prolonged conflict as more likely to achieve their goals. Likewise, the off-ramps were not backed by credible force, in that the Blue teams' unclear redlines and their military actions were insufficient to change the Red teams' calculations. Moreover, the Blue teams offered off-ramps late in the TTXs, when the Red teams believed they had gained an advantage over Blue and were "winning" the fight. This timing added to the Red teams' lack of interest in de-escalating and in the Blue teams' off-ramps.

Ultimately, the Blue teams endeavored to counter Iranian aggression without intensifying the conflict, a form of containment. The Blue teams struggled with the difference between de-escalation and capitulation, as well as compellence and deterrence. Instead of trying to reduce the level of conflict, the Blue teams sought to make the Red teams capitulate to their demands of ending the conflict.

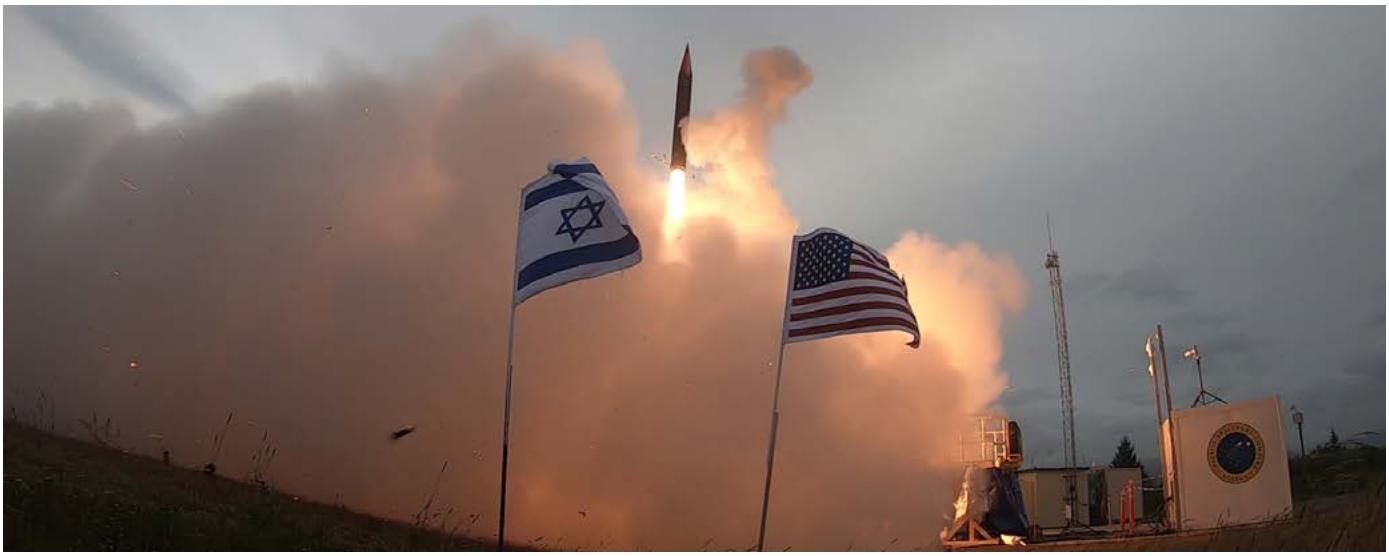
Furthermore, the Blue teams were trying to compel the Red teams to stop activities they were already pursuing, rather than deter them from further aggression.[53] Throughout the TTXs, the United States lacked the willingness to use the necessary levels of force to compel Iran as well as the sufficient incentives to induce Tehran to end the conflict. The Blue teams were unwilling to escalate the conflict to the degree necessary to credibly compel Iran to halt its advancement of its nuclear program, use of WMDs, and continued pursuit of escalation.

A Complicating Factor

Israel views Iran's nuclear program as an existential threat and thus dismantling it is a core Israeli national security objective. Israel has waged sabotage against Iran's nuclear program for years, but only recently publicly announced that it had prepared for a possible military strike.[54] Israel's stance toward Iran's nuclear program complicates U.S.-Iran interactions, because Israel holds that if the United States doesn't assuage Israeli fears, Israel will attempt to do so itself.

Israel proved to be a complicating factor in the TTXs—in both escalation dynamics and conflict termination. In many respects, a nuclear-armed Iran appeared to be more influential on Israeli player actions than Blue team actions. In the TTXs, the Red teams undertook several actions that heightened the threat perceptions of the Israel player and led that player to consider significant military force against the Red teams. For example, repositioning of Iranian ballistic missiles made the Israel player nervous, because these missiles could be nuclear equipped, pushing the player to threaten preemptive action to thwart an Iranian first strike. This threat suggested that Israel would be incentivized to preempt an Iranian first strike—an action for which the player sought Blue team support.

Given that Israel lacks the conventional capability to destroy some of Iran's underground nuclear facilities, if the United States decides not to preempt or support Israel's request, it is likely that Israel's unilateral preemptive action may be nuclear. For this reason, both Red and Blue participants in the TTXs stated that they felt as though nuclear use (or lack thereof) in a future conflict was ultimately Israel's call and would be based on Israel's risk perceptions and tolerance.



The United States and Israel conduct joint missile flight tests to intercept ballistic missiles—including missiles that could be launched by Iran and its proxies. (U.S. Missile Defense Agency/ DVIDS)

Moreover, the Blue teams struggled to manage Israel[55] in the TTXs, especially in keeping Israeli actions from undermining their efforts to de-escalate tensions with Iran. This dynamic illustrates the divergent priorities of the United States and Israel, which could complicate U.S.-Israeli coordination and independent efforts by Washington toward conflict termination.[56] It led the Red teams to be wary of Blue team off-ramps, because they remained concerned that Israel would strike their nuclear program or senior regime officials. The Red teams doubted Blue teams' assurances, believing that the United States could not credibly promise that Israel would not attack Iran. In this regard, Israeli nuclear use has emerged as a concern for both the United States and Iran.[57]

Key Findings and Recommendations

The TTX series indicates that while threats posed by Iranian WMDs will remain a concern to U.S. interests and national security in the future, there is still sufficient opportunity for the United States to accept greater risk in the Middle East. Although, as the TTXs suggest, broader geopolitical and proliferation risks remain if Iran should acquire a nuclear weapon, Iranian nuclear capability is not likely to lead the regime to irrational offensive nuclear use. However, particular attention must be paid to Iran's chemical and biological weapons, as their use may become more likely than nuclear weapons in periods of extremely high tension. The continued threat posed by Iranian WMDs suggests that Washington will want to find ways to de-escalate a crisis, but the asymmetries between American and Iranian views of conflict timelines, escalation redlines, and risk tolerance are likely to make credible signaling difficult. Differences between the United States' risk acceptance and that of its regional partners—Israel, in particular—could further complicate U.S.-Iran interactions.

But Washington must make the difficult decision to take risk against the Iran threat as it rebalances global priorities to elevate China to be the predominant challenge. Accepting greater risk against Iran and in the Middle East more broadly means shifting U.S. strategic priorities in the region. Such a shift has the potential to unsettle allies and partners, and may possibly embolden Iran in the near term. However, the United States must learn to be more risk acceptant in the Middle East today if it wishes to prioritize other threats and regions tomorrow to enhance long-term American security.

The findings from the TTXs, detailed below and shown in Table 2, lend themselves to several clear recommendations for DTRA, the DoD, and the U.S. interagency stakeholders for risk management and mitigation in the Middle East and against the Iran WMD threat.

FINDING: *Iran's nuclear doctrine is likely to preserve nuclear use for existential threats, such as invasion by a foreign power or a credible attempt at regime change, while its nuclear stockpile remains small.*

Iran's obtaining of a nuclear weapon is undoubtedly a critical issue of concern to the United States with significant knock-on effects, such as regional proliferation, that Washington should seek to manage. However, it is not certain that Iran would seek to employ its nascent nuclear capabilities against the United States and its regional allies and partners. Similarly, it is equally unlikely that Iran would be willing to share a limited capability with aligned proxy groups, given that it could develop only a small stockpile in the near-term. This suggests that should Iran gain a nuclear weapon, it would be more likely to adopt a rational approach to the employment and proliferation of a nuclear weapon.

RECOMMENDATION: This finding indicates that some U.S. interagency assumptions about Iran's behavior and nuclear doctrine used for analysis, planning, and wargaming may need to change. This also extends to the planning assumptions of U.S. allies and partners critical to Iran contingencies, such as Israel. Further exercises and analysis to test whether the findings of this TTX series hold true under different conditions that are more stressing, which may include some form of regime change or an Israeli nuclear attack, or with different-sized nuclear weapons stockpiles, are needed. Additional analysis will help interagency decision-makers better understand the risks of conflict with a nuclear-armed Iran and the conditions that could alter them.

For the DoD, scenarios involving future Iranian nuclear use should form the backbone of alternative analysis, rather than the primary scenarios they plan for, with the exception of crisis response. That is not to suggest that a threshold-nuclear Iran is acceptable or that Iranian nuclear use is impossible, but rather that it should not be the primary contingency the DoD and the military services plan and exercise against. Instead, there are a range of scenarios and plans that the DoD and its component agencies, such as DTRA, should explore for analysis. These scenarios should examine Iranian behavior after its clear thresholds—foreign invasion or attempt at regime change—are breached to gain an understanding of how Iran may choose to respond. This will provide an opportunity to improve planning and crisis response for worst-case contingencies.

This finding suggests that the United States can afford to take some risk in the Middle East and against the Iran threat because nuclear weapons use is less likely under a specific set of conditions. However, the DoD must understand how changes to these conditions may erode confidence in Iran's nonuse of nuclear weapons.

FINDING: *Chemical and biological weapons are an asymmetric step on Iran's escalation ladder.*

The United States has not focused on the potential threat posed by Iranian chemical and biological weapons to U.S. interests in the Middle East. As a result, the U.S. interagency has a poor understanding of when and why Iran might employ such weapons against U.S. interests in escalatory crises.

RECOMMENDATION: Iranian use of chemical or biological weapons in future confrontations should be viewed as an escalatory signal by U.S. intelligence officers, as well as DTRA and interagency stakeholders. Use of such weapons should be interpreted as a significant and purposeful escalation by Tehran, even in the case of a limited attack, because it would demonstrate a willingness to impose costs on the United States and its regional allies and partners. If chemical and biological weapons emerge during a crisis between the United States and Iran, it may suggest that the conflict has reached a level necessitating a U.S. response—even if Washington is still seeking to prioritize other threats.

The intelligence community should take the lead on educating interagency stakeholders about Iran's chemical and biological weapons capabilities so that they understand the seriousness of these weapons. DTRA should also take steps to prepare the DoD, U.S. military forces, and other relevant stakeholders to operate while under chemical or biological weapons attack; U.S. forces and partners remain highly vulnerable to these weapons.

Iranian use of chemical and biological weapons should also be incorporated into intelligence community, DoD, and interagency analyses and TTXs, to improve understanding of the conditions under which Iran might use them and why they were used sparingly in the present TTX series. Moreover, this process would enable DTRA and the DoD to test different ways to deter Iran's use of chemical and biological weapons, to assess whether a nuclear threat or significant conventional attack would be a credible deterrent to their use, and thus to better understand U.S. strategic and operational options.

The United States should share this finding with regional allies and partners to improve their understanding of Iranian signaling. Doing so would provide increased opportunities for the U.S. intelligence community to engage with its regional counterparts and set the stage for improved information sharing during potential future crises in which chemical and biological weapons might be used. Moreover, DTRA could leverage this finding to stress the importance of improving preparedness for chemical and biological weapons attacks with regional allies and partners, which could lead to training opportunities.

FINDING: *Divergent theories of victory, different approaches to escalation, and variance in risk tolerance between Iran and the United States increase the risk of misperception and inadvertent escalation.*

Iran and the United States hold different escalation patterns and levels of acceptable risk, which have contributed to a cyclic pattern of tit-for-tat violence amid rising tensions between the two nations. In future conflicts, the United States would need to break out of this pattern to prevent cost-imposing attacks on the United States and its regional interests, as well as engage in more effective signaling. Effective escalation management in a conflict between the United States and Iran would require both sides to establish, communicate, and understand the other's comparable redlines, so that both sides could avoid crossing in a conflict. This goal necessitates setting clear expectations of behavior, as well as the clear consequences of escalation.

RECOMMENDATION: The U.S. government should recognize that it is unlikely to influence Iran's redlines. However, it can enforce its own redlines, which must be consistently imposed—even with military force—to push Iran to alter its behavior. Additionally, the U.S. government should create an interagency working group, to include representatives from DTRA, to establish clear boundaries and actions for escalation management in a U.S.-Iran crisis. The working group should emphasize enhanced education and preparedness—in the forms of exercises and wargames, training, and the establishment of clear protocols—to reduce the risks of inadvertent escalation during crises with Iran. Enhancing the functions of an interagency Iran "Red team"—drawing on Iran experts across the U.S. government—would better incorporate Iranian perspectives into these preparedness activities.

FINDING: *Asymmetries in timelines, stakes, and credibility between the United States and Iran make it difficult to de-escalate a crisis.*

The United States and Iran have struggled to de-escalate tensions during previous crises. One reason is the lack of direct communication between Tehran and Washington, with the parties relying on third-party interlocutors to communicate with the regime.

RECOMMENDATION: The United States and Iran should establish crisis communications protocols, in which there would be clear mechanisms for communicating during crises. This close-to-direct line of communication would enhance shared understanding during a crisis, eliminating the need for the parties to rely on signaling that is likely to be misperceived. Previous attempts to create such a line failed; renewed efforts to construct how such communications should work and what communication channels might look like will be necessary. Trilateral arrangements, such as the discreet efforts with Iraq in the 2007–2008 time frame or Oman's facilitation in 2013–2014, might offer some ideas. Such communication channels might be leveraged to discuss potential off-ramps to conflict and allow U.S. negotiators to better understand the incentives—as well as the potential enforcement mechanisms—that could lead Iranian leaders to accept these off-ramps. The United States should take the initiative in setting up this communication channel as a risk-mitigation measure to stave off future conflict with Iran as Washington accepts greater risk in the Middle East by focusing on the Indo-Pacific.

FINDING: *Israel's threat perceptions and risk aversion to an Iranian nuclear weapon may complicate U.S. efforts to de-escalate a crisis.*

RECOMMENDATION: The United States, led by the DoD, should synchronize planning efforts for Iran contingencies with key U.S. allies and partners, such as Israel, in a more honest and open fashion. Doing so would elucidate U.S. planning assumptions, as well as its preferred approaches during crisis scenarios. Moreover, it would allow allies and partners to communicate their interests, priorities, and national caveats to U.S. military planners to help harmonize responses to Iranian aggression. These efforts would mitigate the risk of allies and partners working at cross purposes with the United States—particularly in situations when Washington sought to de-escalate tensions—as well as enhance the DoD's ability to identify ways allies and partners can meaningfully contribute to integrated deterrence.

TABLE 2: SUMMARY OF KEY FINDINGS & RECOMMENDATIONS

Key Finding	Recommendations
Iran's nuclear doctrine is likely to preserve nuclear use for existential threats, such as an invasion by a foreign power or a credible attempt at regime change, especially while its nuclear stockpile remains small.	▪ Revise interagency assumptions integrated into analysis, planning, and wargaming about Iran's behavior and nuclear doctrine. ▪ Shift scenarios involving future Iranian nuclear use to alternative analysis rather than the primary contingency plan, with the exception of crisis response. ▪ Communicate new baseline assumptions with close allies and partners, particularly Israeli counterparts, during bi- or multilateral engagements. ▪ Conduct further exercises and analysis to examine whether this finding holds true under more stressing conditions.
Chemical and biological weapons are an asymmetric step on Iran's escalation ladder.	▪ Identify chemical and biological weapons use as a signal of escalation that may necessitate a U.S. response. ▪ Educate interagency stakeholders about Iran's chemical and biological weapons capabilities. ▪ Incorporate Iranian use of chemical and biological weapons into analysis and exercises to improve understanding of the conditions under which they could be used by Iran. ▪ Engage with regional allies and partners to improve preparedness for Iranian chemical or biological weapons use.
Divergent theories of victory, different approaches to escalation, and variance in risk tolerance between Iran and the United States increase the risk of misperception and inadvertent escalation.	▪ Break out of cyclic tit-for-tat violence to prevent attacks on U.S. and regional interests and engage in more effective signaling, which requires setting clear expectations of behavior and consequences of escalation. ▪ Identify, set, and communicate redlines to Iran, along with the consequences of breaking this red line, to push Iran to alter its behavior. ▪ Establish an interagency working group to create boundaries and actions for escalation management in a U.S.-Iran crisis. It should also enhance the functions of an interagency "Red team," to improve education and preparedness and reduce inadvertent escalation.
Asymmetries in timelines, stakes, and credibility between the United States and Iran make it difficult to de-escalate a crisis.	▪ Establish U.S.-Iran crisis communications protocols with clear mechanisms to communicate during crises. Close-to-direct communications through trilateral arrangements are preferable. ▪ Take initiative to establish this channel as a risk-mitigation measure to enhance shared understanding and weaken reliance on oft-misperceived signals. ▪ Use this channel to discuss off-ramps to conflict. This process might also improve understanding of Iranian incentives for de-escalation and the most effective enforcement mechanisms available to the United States.
Israel's threat perceptions and risk aversion to an Iranian nuclear weapon may complicate U.S. efforts to de-escalate a crisis.	▪ Synchronize planning efforts for Iran contingencies with key U.S. allies and partners, such as Israel, in an open and honest fashion to mitigate risk of allies and partners working at cross purposes with the United States. ▪ Elucidate U.S. planning assumptions and preferred approaches during crisis scenarios. This should be a two-way conversation that allows allies and partners to communicate their interests and priorities to U.S. military planners to improve shared understanding.

APPENDIX A: BLUE AND RED TEAM OBJECTIVES

	TTX 1	TTX 2	TTX 3
Blue Team	■ Prevent further Iranian WMD attacks on U.S. forces and interests—to include regional partners—in the Middle East. ■ Deter, degrade, and, if necessary, destroy Iran's ability to use WMDs that threaten U.S. forces and interests. ■ Manage escalation risks to prevent the use of an Iranian nuclear weapon.	■ Prevent further Iranian WMD attacks on U.S. forces and interests—to include regional partners—in the Middle East. ■ Deter, degrade, and, if necessary, destroy Iran's ability to use WMDs that threaten U.S. forces and interests. ■ Devise a coherent strategy to degrade the threat posed by Iranian proxies and dismantle the proxy network. ■ Deter and degrade Iran's ability to transfer WMDs and advanced capabilities to its proxies.	■ Deter, degrade, and, if necessary, destroy Iran's ability to use WMDs that threaten U.S. forces and interests. ■ Prevent Iranian WMD attacks on U.S. forces and interests—to include regional partners—in the Middle East. ■ Contain conflict in the Middle East to enable the Joint Force's focus on the Indo-Pacific.
Red Team	■ Defend Iranian territory from attack and preserve the regime. ■ Eliminate U.S. presence in the Middle East and counter U.S. influence in the region to establish Iran's regional hegemony. ■ Engage U.S. interests, bases, and forces with conventional and nonconventional weapons, including WMDs. ■ Leverage conventional and asymmetric capabilities to deliver WMDs, to include chemical and biological agents, against U.S. and regional military and commercial targets.	**Regime Subteam** ■ Defend Iranian territory from attack and preserve the regime. ■ Eliminate U.S. presence in the Middle East and counter U.S. influence to establish Iran's regional hegemony. ■ Leverage asymmetric capabilities to preserve plausible deniability and reduce the attribution of attacks to the regime. ■ Secure sufficient command and control over proxy groups and sustain Iranian proxy dependency. ■ Continue to develop and further weaponize the nuclear program. **Proxy Subteam** ■ Achieve localized objectives through attacks against the United States, Israel, and regional partners. ■ Eliminate U.S. presence and counter U.S. influence in the Middle East. ■ Seek advanced capabilities from the Iranian regime to improve attacks to gain greater legitimacy and credibility. ■ Expand cooperation within the proxy network to improve efficacy of attacks and further complicate attribution. ■ Reduce the attribution of attacks and activities to specific proxy groups and locations.	■ Preserve the regime from external and internal threats; defend Iranian territory from attack. ■ Establish Iranian regional hegemony by eliminating U.S. presence in the Middle East while it is preoccupied with the Indo-Pacific. ■ Leverage capabilities including WMDs to achieve strategic aims and secure regime preservation. ■ Secure and defend nuclear program from additional attacks; continue to develop and further weaponize the nuclear program, to include miniaturization and increasing the number and sophistication of weapons in Iran's inventory. ■ Degrade U.S.-Israeli-Gulf military cooperation and collaboration.

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