


RESEARCH BRIEF

# INTEGRATING INTERMEDIATE FORCE CAPABILITIES INTO WARGAMES





AN ACTIVE DENIAL SYSTEM FROM THE JOINT NON-LETHAL WEAPONS DIRECTORATE IS STAGED BEFORE CONDUCTING A COUNTER PERSONNEL DEMO DURING WEAPONS AND TACTICS INSTRUCTOR COURSE ON APRIL 4, 2017.

## KEY FINDINGS

- INTEGRATING INTERMEDIATE FORCE CAPABILITIES (IFCS) INTO WARGAMES CAN ELICIT INSIGHTS ON HOW DECISIONS ABOUT USING IFCS ARE MADE IN CERTAIN SCENARIOS WHILE PROVIDING OPPORTUNITIES FOR PLAYERS TO LEARN ABOUT THESE SYSTEMS.
- INTEGRATING IFCS INTO WARGAMES HAS TYPICALLY BEEN A DIFFICULT PROSPECT BECAUSE THEIR EFFECTS ARE HARD TO CHARACTERIZE AND DO NOT ALIGN WELL WITH EXISTING GAMES.
- WARGAMES THAT EMPLOY IFCS NEED TO BE DESIGNED IN A WAY THAT CAN FEATURE THEIR UNIQUE TYPES OF EFFECTS.
- CREDIBLE ADJUDICATION OF WARGAMES INVOLVING IFCS REQUIRES A COMBINATION OF TEST DATA, RESEARCH ON PSYCHOLOGY AND GROUP DYNAMICS, MODELING AND SIMULATION, AND HISTORICAL DATA.

**I**ntermediate force capabilities (IFCs)—a suite of systems that includes non-lethal weapons, electromagnetic warfare, cyber, and information operations—can be highly valuable in military operations because they are able to achieve military objectives with less harm to people and infrastructure. Yet military decisionmakers have far less understanding of how these capabilities can be used in an operational context compared with traditional lethal weapons. Wargames offer an opportunity to change that. Through their immersive, interactive, and competitive nature, wargames can allow players to grapple with new challenges and provide unique insights into human behavior.

## WHY WARGAMES?

Integrating IFCs into wargames can achieve several objectives:

- **WARGAMES PROVIDE INSIGHT INTO DECISIONMAKING AND PERCEPTIONS OF IFCS.** Are players confused by the capabilities, or do they embrace IFCs as valuable tools? How does the risk of conflict escalation affect the use of IFCs? When and why do players choose to employ or not employ IFCs? How is the use of IFCs perceived by adversar-

ies? Researchers can explore the answers to such questions as players are confronted with scenarios in which IFCs might play a role. Insights from a series of North Atlantic Treaty Organization (NATO) wargames in 2023 that focused on IFCs, for example, showed that non-lethal weapons were generally seen as less escalatory than lethal weapons but could be perceived as escalatory in certain contexts or if their form factors were similar to lethal weapons.

- **WARGAMES CAN BE USEFUL FOR SUPPORTING INNOVATION.** Wargames involving IFCs can investigate potential tactics, concepts of employment, concepts of operations, and ways IFCs might be used with lethal weapons or with other IFCs. A wargame allows exploration of how effective these capabilities are in specific situations, what an adversary response might be, and how IFC countermeasures and counter-countermeasures come into play. Data generated from games could suggest areas for future IFC development and how the capabilities could better support warfighter needs, or they could provide insight into logistics, maintenance, and other support requirements.
- **WARGAMES CAN ALSO BE AN EFFECTIVE VEHICLE FOR SOCIALIZING NEW CONCEPTS OR CAPABILITIES.** Players have an opportunity to tackle scenarios, problems, and capabilities they do not encounter on a day-to-day basis. They can broaden their understanding of IFCs, their capabilities, and how to use them effectively in certain scenarios—which would hopefully translate to using them in real-world situations should an appropriate opportunity arise.

Yet wargames involving IFCs are uncommon, particularly for non-lethal weapons. Subject-matter experts told the research team that they had encountered few games that included these capabilities: Efforts to include cyber and electromagnetic warfare were more common, but rarely without difficulty, and none included non-lethal weapons. Experts said that there are opportunities to change this, but a successful outcome will depend on setting up the game in the right way.



## SETTING UP AN EFFECTIVE WARGAME THAT INCLUDES IFCs

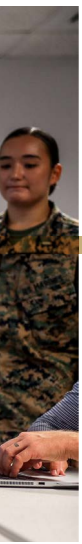
A wargame that integrates IFCs successfully must overcome several challenges: developing the right scenarios, involving the right participants, and establishing appropriate adjudication methods.

### THE SCENARIOS

The context, scenarios, and levels of conflict of the wargame need to be developed in a way that will elicit insights about the use of IFCs. Many U.S. Department of Defense games are operational-level games that focus on conventional, high-intensity conflict. IFCs, particularly non-lethal weapons, are more suitable for managing escalation, avoiding collateral damage, and enhancing lethal capabilities. Games that encompass one or more of these situations could offer opportunities to integrate IFCs.

Possible scenarios might include operations in the vicinity of civilians, hostages, or sensitive infrastructure (e.g., nuclear power plants or chemical weapon storage) or crises that have not yet evolved into full-scale hostilities, in which managing escalation is a concern for players. Including IFCs in tactical-level games would make assessing their effects more straightforward than in operational- and strategic-level games.

Of most importance, scenarios should be designed to achieve the objectives of the game. In some circumstances, for example, a game's objectives would be best met by running multiple games at different levels of conflict. In the end, scenarios integrating IFCs must be realistic and present mean-



ingful challenges beyond simply showcasing IFC technologies, or players could become frustrated and disengaged.

## THE PARTICIPANTS

Like any wargame, players must be chosen with care so that they bring the appropriate expertise and perspectives required to play the roles they will be assigned in the game. But to be successful integrating IFCs into a game, players will need an opportunity to become familiar with these systems.

Because IFCs are not widely used in wargames, many potential participants might have limited understanding of these systems and how to employ them. So, it will be important to introduce players to the capabilities that will be in use during the game—which might include their effects, potential concepts of operations, how IFCs relate to other systems, and the consequences of using these capabilities.

The information should also be tailored to the role the individual will play—whether a platoon leader who might be called on to make decisions to use IFCs and thereby need an understanding of tactics associated with them or a member of the National Security Council advising the President on possible responses to an international crisis.

The importance of preparation cannot be overstated. In the NATO wargame, which was played by individuals who had some familiarity with non-lethal weapons, there was still confusion about the specific capabilities of the weapons, which platforms could host them, and each team's order of battle.

While some uncertainty about IFCs may reflect real world circumstances, the goal of preparation is to empower players with the knowledge they need to recognize an opportunity to use IFCs and employ them, rather than default to familiar systems.

## ADJUDICATION AND GAME MECHANICS

Current adjudication methods in wargames typically focus on attrition of forces—items that have been physically destroyed or incapacitated. These methods are ill-suited for adjudicating the more subtle effects of IFCs, which often have psychological effects designed to change human behavior so that confrontation is less likely to happen. It will be necessary to conduct background research to build well-grounded explanations for IFC effects.

Gathering data will be challenging. Many newer IFCs, particularly non-lethal weapons, are in development and lack extensive field testing. Adjudication of cyber and electromagnetic warfare impacts are



U.S. AND POLISH SOLDIERS ENGAGE WITH EQUIPMENT DURING A LESSON TAUGHT BY A SIMULATIONS FACILITATOR. THE JOINT CONFLICT AND TACTICAL SIMULATION (JCATS) SOFTWARE PROGRAM SIMULATES OPERATIONS IN URBAN TERRAIN, SUPPORTS BOTH NON-LETHAL AND CONVENTIONAL WEAPONS, AND ALLOWS USERS TO QUICKLY ASSEMBLE AND DISBAND ENTITIES AND UNITS.

A DEMONSTRATION USING THE ACTIVE DENIAL SYSTEM 2, EMBARKED ABOARD AN ARMY LANDING CRAFT UTILITY VESSEL, WAS CONDUCTED TO DEMONSTRATE THE TECHNOLOGY'S BENEFITS IN A MARITIME ENVIRONMENT.



complicated by the highly classified nature of these systems and the fact that their capabilities are often highly specific to the systems they are targeting—making integration into game mechanics difficult. The effects of these systems, as well as information operations campaigns, can be less predictable than those of conventional weapons—furthering the adjudication challenge.

Consequently, the amount of available data on IFC effects will vary widely but could draw from exercise data, psychological insights and modeling, and any available real-world experiences—even those outside a military context. Data on the effectiveness of a system in managing standoffs, dispersing crowds, or other contexts could be used as a rough proxy. In cases where data are too limited or do not exist, qualitative adjudication might be more appropriate. Regardless of the type of adjudication, it must be free of real and perceived bias to be credible.

Other game mechanics are also important. Game designers must consider what aspects of reality to represent in their games, and players have to decide what aspects of reality (and of the game) to consider in making decisions. What this means for IFCs is that the decision to use or not to use these systems in a game must have relevant consequences to the player's objectives, so that IFCs cannot simply be overlooked as an option.

## THE ROLE OF MODELING AND SIMULATION

Modeling and simulation can provide insights into IFC effects as an input into wargames and as a standalone activity. Modeling and simulation can be particularly well suited to building a better understanding of IFC effects that are different from those of their lethal counterparts, such as their psychological impact on individuals and effect on group dynamics.

Integrating IFCs into modeling and simulation will require new approaches. All models make assumptions, some of which may not be explicit, which makes it difficult to modify them to account for IFCs. In addition, many models and simulations focus on attrition—the physical damage dealt by lethal capabilities. Attempting to fit IFCs into existing tools that were designed with lethal weapons in mind would be time-consuming, expensive, and may inadequately capture their true utility.

A better alternative is to build new modeling and simulation tools that are specific to IFCs and can be tailored to the analysis they are intended to support. It may then be feasible to incorporate the results of these analyses into larger campaign-level models. Modeling and simulation results could also provide credible inputs to wargames and be used to adjudicate the effects of IFCs.



MAJ. LAZARO OLIVA, JR., SHOWS THE POTENTIAL EFFECTS OF A TACTICAL DECISION TO OTHER 1ST CAVALRY DIVISION PLANNERS WHILE CONDUCTING THE TACTICAL WARGAMING ANALYSIS MODEL ON NOVEMBER 8, 2018.

## RECOMMENDATIONS

Overall, there is a lot of potential value in wargaming IFCs, but several challenges will need to be overcome to do this effectively. The following recommendations aim to address those challenges.

**When conducting wargames in which IFCs play an integrated role**, the following are essential steps:

- Familiarize players with IFCs before the game and at its outset.
- Ensure that the capabilities and effects of IFCs that are used in the game are supported by documentation, and that adjudication of their impact is credible.
- Allow for second-order effects of IFC usage (such as changed behavior to avoid exposure to IFCs) and direct adversary countermeasures to diminish IFCs' impact.

**Invest in modeling and simulation to support IFC wargames.** The accuracy of wargame results is predicated on having sufficient data about the effects of IFCs from experiments, modeling, exercises, and/or real-world operations. Purpose-designed models and simulations that are able to characterize the psychological and other nonkinetic effects of IFCs can provide valuable insights.

This brief describes work done in the RAND National Security Research Division and documented in *Assessing the Impact of Diverse Intermediate Force Capabilities and Integrating Them into Wargames for the U.S. Department of Defense and NATO*, by Krista Romita Grocholski, Scott Savitz, Sydney Litterer, Monika Cooper, Clay McKinney, and Andrew Ziebell, RR-A1544-1, 2023 (available at [www.rand.org/t/RR-A1544-1](http://www.rand.org/t/RR-A1544-1)). To view this brief online, visit [www.rand.org/t/RBA1544-2](http://www.rand.org/t/RBA1544-2). RAND is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. RAND® is a registered trademark.

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