

ARMED ROBOTIC SYSTEMS EMERGENCE: WEAPONS SYSTEMS LIFE CYCLES ANALYSIS AND NEW STRATEGIC REALITIES

Robert J. Bunker

The fielding of armed robotic systems—droids and drones that are teleoperated, semi-autonomous, and even autonomous—has been slowly but surely transitioning from pure science fiction into military reality on the battlefields of the early 21st century. These systems currently have no artificial intelligence (AI) whatsoever and, in most cases, are simply operated by soldiers (and on occasion terrorists and insurgents) utilizing hardline cables and laptop-like controllers, although wireless and satellite systems exist for the more sophisticated national armed drone programs. Near-term future prototypes are likely to have, at best, independent response capabilities similar to a trained animal, due to the incorporation of expert system programming. Projections out even further, however, have raised concerns that these emergent weapons systems, possessing semi-autonomous and autonomous capabilities, could ultimately have the potential to evolve beyond the machine stimulus and response level, eventually incorporating varying degrees of weak AI, and one day possibly even achieving a basic form of self-awareness.

This monograph will initially discuss the weapons systems life cycles analytical approach, which is militarily historical and qualitative in its methodology. This approach distinguishes between the experimental (entrepreneurial), institutionalized, ritualized, and satirized (or romanticized) phases that exist for an individual weapons system. It will then draw upon three case studies related to the knight, the battleship, and the tank in order to explain this militarily historical process and provide the needed context in which to strategically understand the expected trajectory that armed robotic systems may begin to progress through, if earlier weapons systems developmental patterns hold true. Given the U.S. Army's great reliance on armored forces in the modern era, special attention has been afforded to the tank. Not only is this weapons system undergoing its own process of life cycle phase

progression into what can be argued is its ritualized phase, but it is also projected that, at some point in the future, armed robotic systems will be co-fielded in coordination with tank forces.

Derived from the analysis conducted in this monograph, armed robotic systems can be readily recognized as still being in their initial experimental (entrepreneurial) life cycle phase. Modern militaries—with the United States in the lead—have been engaging in a trial and error process of developing and fielding these systems for about 15 years. This entire process is a result of the Central Intelligence Agency (CIA) initially placing air-to-ground missiles (AGM) on a Predator drone in 2001. This event was prompted by a mission in October 2001, directed at Mullah Mohammed Omar—the Taliban leader—as part of the global U.S. response to the 9/11 attack carried out by al-Qaeda. Predator drones have existed since 1995, when they were first deployed to Bosnia. Until the attempted targeted-killing of Mullah Omar, however, they had only been utilized for intelligence, surveillance, and reconnaissance (ISR) missions.

Drawing upon this monograph's analysis, the emergence of armed robotic systems and the strategic questions pertaining to them can be better placed in historical context, that is, as they relate to military technical advances, identifiable weapons systems life cycle developmental patterns, and their interactions with changes in warfare over time. The following questions of immediate warfighting importance—given the new strategic realities that armed robotic systems likely portend—and the analytical responses to them are provided in this manuscript:

- What threat and/or technological advancements are armed robotic systems being fielded to contend with?
- What present weapons systems may armed robotic systems make obsolete?

- How are armed robotic systems more technologically advanced (and have more energy potential at their disposal) than the legacy weapons systems they may be eventually replacing?
- How do we know when we have achieved the armed robotic systems' institutionalized life cycle phase?
- How many years will the armed robotic systems' experimental life cycle phase span?
- What are the implications of the ritualized life cycle phase of the tank on the experimental fielding of armed robotic systems?
- What are the implications of fielding armed robotic systems – and for that matter, industrial robots – vis-à-vis the integrity of the American middle class?
- What are the implications of armed robotic systems proliferation – especially semi-autonomous and autonomous systems – on the human species?

A number of initial recommendations have been generated for U.S. Army and Joint force personnel pertaining to the emergence of armed robotic systems on the battlefield. These recommendations are not meant to be authoritative but rather, given the present experimental nature of armed robotic systems as their initial prototypes and fielding is being worked out, to be simply taken as educated guidance. These recommendations pertain to the following thematic areas:

- Leadership Education;
- Strategy Development;
- Intelligence; and,
- Research and Wargaming.

In summation, the strategic implications of the robotics revolution upon us cannot be overstated. The robots are not only coming – they are here – and for future U.S. national security requirements, we will need to have a military mastery over them. Hence, our present and future decisions related to armed robotic systems emergence on the battlefield – and the command and control (C2) methodologies directing them – will result in near-term and future force structure end states that will have a fundamental impact on the U.S. conduct of war in the coming decades. These decisions will be a major determinant concerning the ability of the United States to retain dominance as the primary global military power well into the mid-21st century.

More information about the programs of the Strategic Studies Institute (SSI) and U.S. Army War College (USAWC) Press may be found on the Institute's homepage at ssi.armywarcollege.edu.

Organizations interested in reprinting this or other SSI and USAWC Press executive summaries should contact the Editor for Production via e-mail at SSI_Publishing@conus.army.mil. All organizations granted this right must include the following statement: "Reprinted with permission of the Strategic Studies Institute and U.S. Army War College Press, U.S. Army War College."



This Publication



SSI Website



USAWC Website