



NATIONAL SOCIETY OF  
PROFESSIONAL ENGINEERS

# BOARD of ETHICAL REVIEW

CASE REVIEW

## Design of Safe and Lethal Munitions Handling Equipment

Case No. 25-1

NSPE.ORG



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### Facts

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Engineer Z is a licensed professional engineer recently employed by Firm A, a private mechanical engineering firm. Firm A holds a competitively-awarded contract with a munitions manufacturer to design, prototype, and qualify specialized ground support equipment for the safe transport, positioning, and loading of live combat munitions (e.g., artillery shells, aerial bombs, and guided missiles). The equipment incorporates technical controls and enclosures to minimize accidental detonations or personnel injuries during handling and loading of the munitions by military personnel. The equipment also enhances overall operational effectiveness and lethality of the weapon systems it services by improving loading and system reliability.

Engineer Z's duties include specifying safety interlock logic and supervising prototype testing

to verify compliance with industry-established safety requirements. The project documentation provided to Engineer Z highlights dual objectives: (a) reducing occupational hazards for ordnance technicians, and (b) enabling faster, more reliable deployment of munitions in combat.

Engineer Z begins to reflect on the dual objectives of the project during design reviews. Based on this reflection, Engineer Z decides to continue their work on the project but sends an email message to the leadership of Firm A stating, "I will finish the work on this project. However, upon the completion of the delivery of these documents, I am requesting relocation to a team within Firm A that does not work on projects related to the design of munitions systems."

### Questions

1. Is it ethical for Engineer Z to participate in the design and production of equipment when they know that the project's intent is to both (a) protect military personnel from accidental harm and (b) increase the efficiency and effectiveness of delivering lethal force?
2. Is it ethical for Engineer Z to notify Firm A that while they will finish the work on this project, they will refuse to perform work on future munitions projects?

## Code of Ethics References:

**Preamble:** Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and, welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

**I.1** Hold paramount the safety, health, and, welfare of the public.

**I.4** Act for each employer or client as faithful agents or trustees.

**I.5** Avoid deceptive acts.

**I.6** Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

**II.4.a** Engineers shall disclose all known or potential conflicts of interest that could influence or appear to influence their judgment or the quality of their services.

**III.1.b** Engineers shall advise their clients or employers when they believe a project will not be successful.

**III.1.f** Engineers shall treat all persons with dignity, respect, fairness and without discrimination.

**III.2.a** Engineers are encouraged to participate in civic affairs; career guidance for youths; and work for the advancement of the safety, health, and well-being of their community.

**III.2.d** Engineers are encouraged to adhere to the principles of sustainable development in order to protect the environment for future generations.

**III.3** Engineers shall avoid all conduct or practice that deceives the public.

## BER CASE REFERENCES:

[BER Case 82-5](#); [BER Case 98-8](#); [BER Case 06-8](#); [BER Case 09-4](#); [BER Case 22-10](#)

### Discussion

The practical focus of this case is whether it is ethical for Engineer Z to participate in the design and production of military equipment when they know the intent is not only to protect military personnel from accidental harm but also to increase the efficiency and effectiveness of delivering lethal force. Philosophers tell us this is an “applied ethics” question. Accordingly, the bulk of this case study will focus at the applied ethics level. By way of context, this ethics case also considers “normative ethics” questions. Normative issues focus on frameworks for moral conduct—for this case, right and wrong behavior associated with war. In the present case, Engineer Z’s ethical reflections on the munitions design and testing work are mostly at the normative level. Other engineering challenges which routinely engage normative ethics questions include sustainability, data privacy and security, and artificial intelligence, to name a few.

First, the Board of Ethical Review (BER) will consider the applied level. Protecting the safety, health and welfare of the public is presented in the NSPE Code of Ethics (the Code) Section I.1. Working on a project with an expressed goal of protecting personnel, military or not, from harm is entirely consistent with Code Section I.1. A host of BER cases support this fundamental position, but only a few cases—that is, three—directly consider other aspects of ethical work within the defense industry.

In [BER Case 82-5](#), Engineer A was employed by a large industrial company that engaged in substantial work on defense projects. Engineer A’s assigned duties related to the work of subcontractors, including review of the adequacy and acceptability of the plans for material provided by subcontractors. In the course of this work, Engineer A advised his superiors by memoranda of problems he found with certain submissions of one of the subcontractors and urged management to reject such work and require the subcontractors to correct the deficiencies he outlined. For the purposes of the present Case, Engineer Z’s employment situation for a (private) defense contractor is similar to that of Engineer A in [BER Case 82-5](#), and this case provides an illustrative example of the kind of ethical situation that might arise.

In [BER Case 98-8](#), a different Engineer A was asked to certify that arms storage rooms and racks on a military installation comply with regulations. The BER examined this case based on the engineer’s competency to perform work. The fact the work supported the Army did not directly enter into the BER’s decision.

[BER Case 09-4](#) introduced yet another Engineer A, who worked for the U.S. Government in a defense agency for many years as an engineer, rising to a fairly high managerial position in the government. Upon retirement, Engineer A (09-4) accepted an executive position with SuperCom, a

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company producing electronic equipment for the military. Shortly after joining SuperCom, Engineer A (09-4) was informed by a manager in another SuperCom division that, under an existing contract with the Department of Defense, a key test on an important product was not being performed in the manner specified by the contract. According to the employee, this practice had been going on for several years and the subordinate felt very uncomfortable about it.

These three cases portray a relatively typical professional ethics climate for engineers working in the defense industry. That is, the types of issues engineers face in the defense industry are not much different from those of engineers who work in non-defense market sectors. In contrast, Engineer Z appears to be troubled by working on projects that “deliver lethal force” —a system designed for use, presumably by the military, to kill others. The BER case collective is sparsely populated with cases that address this particular military issue; our examination found only one.

[BER Case 06-8](#) is the BER’s attempt to answer if a professional engineer continues to have ethical obligations under the Code as a member of the U.S. military. The discussion in [BER Case 06-8](#) pointed out that the case rose “issues of first impression.” The BER had not reviewed a similar situation, so they looked to the language in the Code and earlier cases that may have raised similar issues; that is the approach we take in this case. The discussion in [BER Case 06-8](#) includes a short, but fascinating discussion on the ethics of military service. The BER points out that the ethics of military service is a broad and complex topic with roots not only in professional ethics

but also common morality, philosophy, religion, and other ethical theories, traditions, and practices. Though it was beyond the scope of [BER Case 06-8](#) to explore all of these issues, the BER did comment on Engineer A’s responsibility as an engineer, in particular, situations or practices that might conflict with fundamental provisions of the Code, such as the engineer’s obligation to hold paramount the safety, health, and welfare of the public. “It is the [BER’s] view that the right to follow one’s own conscience is a fundamental human right that cannot be abrogated by civil or military authority. As related to engineering work, this includes, but is not limited to, one’s conscience as informed by the [Code].”

The way in which human conscience informs and guides personal morality in the context of war is largely a “normative” ethical consideration, the extremes being nationalism (i.e., “hawks”) which holds that war which serves a nation’s interests, for example, protecting the way we live, is justifiable, versus pacifism (i.e., “doves”) which is the opposition of war or violence and holds that there has never been nor can there ever be a justifiable basis for war. Between these extremes is “Just War Theory,” the aim of which is to reconcile the exigencies of defense with the inherent wrongness of killing.

While the Code is largely practical (applied) in its precepts, it is not silent on normative guidance. The Preamble to the Code introduces engineering as an “important and learned profession” which has “a direct and vital impact on the quality of life for all people.” Accordingly, engineers must perform under a standard of

professional behavior that requires adherence to the highest principles of ethical conduct. Similarly, Code Section I.6 states that engineers shall “conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.” These are normative principles.

Further, the Code requires engineers to be honest and avoid deception (Code Sections III.3 and I.5), it encourages engineers to adhere to the principles of sustainable development to protect the environment (Code Section III.2.d), and to work for the advancement of the safety, health, and well-being of their community (Code Section III.2.a). Most significantly, the code recognizes engineers may face divided loyalties, and in such a case, the engineer must carefully “disclose interests that could influence or appear to influence their judgment or the quality of their services” (Code Section II.4.a) and “advise their clients or employers when they believe a project will not be successful” (Code Section III.1.b). Again, these are normative principles.

Consistent with this guidance, but within a sustainability (not weapons) context, [BER Case 22-10](#) introduced Engineer Intern Wasser who was a new employee at Cutting Edge Engineering. Wasser was assigned the task of sketching out details for the irrigation system of a new resort that will be located in a semi-arid region of the southwestern United States. Wasser refuses to perform the task and said the traditional irrigation system would waste fresh water, cited a recent hydrogeological study indicating that the proposed use would lower the water table, and asserted that Cutting Edge should not do this kind of work. In a formal memorandum to his supervisor, Wasser argued the proposed lawn irrigation system was not consistent with several United Nations sustainable development goals.

[BER Case 22-10](#) is not about war munitions, but it does engage normative ethical considerations associated with sustainability, in particular, how to responsibly dissent when faced with a task the engineer is not personally comfortable with. In [BER Case 22-10](#), the Board found that as a matter of personal conviction, Engineer Intern Wasser can dissent and not perform the task (i.e., dissent is ethically permissible), but if Cutting Edge’s position does not align with Wasser’s view, this would create significant career issues for Engineer Intern Wasser. Likewise, in the instant case, if Engineer Z determines that munitions design intended to deliver lethal force is at odds with Engineer Z’s personal beliefs, Engineer Z’s right to follow their own conscience certainly exists.

More significantly in [BER Case 22-10](#), the BER found that Engineer Intern Wasser was in a unique position to meaningfully serve both the client and his company. By introducing and offering sustainable alternatives to a traditional lawn irrigation system, Engineer Intern Wasser and Cutting Edge could harmonize Code Sections I.4 (faithful agent) and III.2.d (sustainable design). Engineer Intern Wasser seemed more likely to fulfill the ethical obligations and aspirations—not by refusing the task, but by performing the task with technical expertise, mature leadership and dedicated service to the client’s needs. Granted, in the present case Engineer Z’s concern is to preserve lives rather than the environment, but the same approach might be effective and fruitful for Engineer Z.

Turning to the key ethical questions—is it ethical for Engineer Z to participate in the design and production of equipment when they know that the project’s intent is to both (a) protect military personnel from accidental harm and (b) increase the efficiency and effectiveness of delivering lethal force? This discussion shows it is certainly

ethical for Engineer Z to work on a project with a goal of protecting military personnel from accidental harm. As to increasing efficiency and effectiveness in delivering lethal force, per the NSPE Code and as discussed in [BER Case 06-8](#), the right to follow one's conscience is a fundamental human right. Some engineers may choose to work building aircraft, ships or weapons used by the military; others may not. In either case, Engineer Z should faithfully follow their own conscience. But as discussed in [BER Case 22-10](#), it may be that continuing in the project is the most effective way Engineer Z can fulfill their desire to save lives.

As to whether it is ethical for Engineer Z to notify Firm A that while they will finish the work on this project but will refuse to perform work on future munitions projects, this is also ethical.

By choosing to complete work on the project, Engineer Z is acting as a faithful agent of Firm A. Engineer Z's request to no longer work on munitions projects is also consistent with the Code – Engineer Z is disclosing a conflicting interest and is seeking to act consistent with their conscience. While some may disagree with Engineer Z, Code Section III.1.f notes an engineer's obligations to treat all persons with dignity, respect, fairness, and without discrimination. Ideally, Firm A can accede to Engineer Z's request to no longer be assigned to munitions projects. However, if Firm A makes a business choice to continue munitions work and cannot accommodate Engineer Z's request, Engineer Z will likely be compelled to resign and find employment elsewhere.

## Conclusions:

1. It is ethical for Engineer Z to participate in the design and production of equipment when they know that the project's intent is to protect military personnel from accidental harm. It would be ethical for Engineer Z, as a matter of conscience, to choose not to participate in munition design that increases the efficiency and effectiveness of delivering lethal force.<sup>1</sup>
2. It is ethical for Engineer Z to notify Firm A that while they will finish the work on this project, they will refuse to perform work on future munitions projects.

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<sup>1</sup> The BER is not deciding on the ethics of war or an engineer's decision on the topic.

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