The Price for Blowing the Whistle when Facing Ethical Dilemmas

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Abstract

Many engineers and scientists join the defense sector, because it offers well-paying opportunities to work on challenging technical problems. However, some face ethical dilemmas about the nature of their work and its end use. Examples range from the Manhattan Project that developed the atom bomb during World War II, to the more recent Project Maven at Google that used artificial intelligence for combat drones. In both of these cases, several project participants questioned the morality of their work. The problem in most cases is that individuals have to make difficult choices alone when facing an ethical dilemma. There is very little choice in finding alternative work since defense organizations do not typically have nondefense projects. This paper narrates two case studies drawing on the author's own experience working on the Pentagon's missile defense program. The first relates to author's experience in a laser weapon program and the second, as an investigator for the US Government Accountability Office. The research methodology is strictly narrative. It describes the author's efforts to bring to light the ethical lapses and the lessons learned.

I. INTRODUCTION

Every physician has to take the Hippocratic oath before he or she starts out to practice medicine, which binds them to certain ethical standards. Lawyers are required to take an ethics test. Scientists and Engineers do not have to take any such oath before they start working in their profession even though many of the products of their labor can have huge societal impacts, sometimes destructive. The poison gas, the atom bomb, napalm, and cluster weapons, are but a few examples of the horrors brought by sophisticated weapons developed by scientists and engineers. Newer and ever more destructive weapons are being invented and deployed every day.

"Not only is there no such oath to be taken, but most schools also do not teach social responsibility and ethics." What is considered socially responsible and ethical behavior depends on the social and moral values, culture, history, and traditions of a nation. Individuals face ethical or moral challenges guided by their personal and social backgrounds, which vary widely.

In the United States, the so-called military-industrial complex is vast. It employs about 3 million people, including several hundred thousand scientists and engineers in R&D, design, and production. The majority work for defense contractors falls to large companies like Boeing, Lockheed-Martin, Raytheon, and Northrup Grumman. There are also over 150,000 professionals, who work directly for the U.S. government in military services, defense and nuclear weapon laboratories, or the Pentagon as well as agencies like the Defense Advanced Research Project Agency (DARPA).

In the author's experience, most people who work for the defense industry do so because the jobs can be often interesting and they pay well. Some are motivated by an opportunity to serve

the nation and consider the job moral, while others do not think about ethical issues. The latter group often brushes aside any such question by labeling their job as purely technical. Fewer still are those who are not comfortable with what they do and look to get out. However, they are often stuck either because of family obligations or a lack of transferable skills after they have spent ten or more years in the defense business.

The author, confronting a serious ethical dilemma after a career of over twenty years in defense R&D, tried to resolve the issue through normal channels of communication within his organization. After failing to do so he left the defense industry. His experience is detailed in the first case study.

He was faced with yet another ethical challenge in his new career as an analyst for the investigative arm of Congress, the Government Accountability Office (GAO). There he encountered a cover-up by GAO of fraud in the missile defense program. Once again, he tried to work through normal channels to rectify the situation and failed. Subsequently, he decided to go public, thus becoming the first and so far the only whistle blower in the history of GAO. It is the subject of the second case study.

This paper is organized into six sections. The first section introduces the concept of the military-industrial complex. The second describes the defense R&D enterprise. The third covers the history of the missile defense program in question and the following two sections deal with the case studies related to the author's personal experience in facing ethical challenges in the defense industry, and the Government Accountability Office, respectively. In the sixth and the final section the author summaries the main findings and his suggestions for a path forward.

II. THE MILITARY-INDUSTRIAL COMPLEX

In January 1961, President Dwight D. Eisenhower in his farewell speech[1] to the nation warned the American people of the dangers arising out of the growing influence of what he called the "military-industrial complex" (MIC).1 Eisenhower, himself, had presided over the vast buildup of an armaments industry after the end of World War II. The military spending was based on a new strategy to fight the ensuing Cold War. It meant to spur economic prosperity and fight communism at the same time. [2] The spending created many stakeholders, principally the military, the defense industry, Congress, and universities.

The military budget 2 had large outlays on scientific research, broadly speaking, but specifically for research and development of sophisticated weaponry in order to gain a "technological edge" over the Soviet Union. The bond between science, technology, and the military that started during WWII to develop the radar, sonar, and the atom bomb, grew deeper throughout the Cold War. Thus, universities became an integral part of the MIC. As the defense budget increased over time, so did the size and influence of the MIC, driven by defense contractors with the eager participation of many members of Congress, who find the large defense budget an easy source of money for "bringing the bacon home." Members, who sit on the powerful defense committees of Congress, benefit from large campaign contributions of the defense contractors. They return the favor by making sure that the Pentagon's annual wish list outside the official budget is granted through "plus-ups."

1 Eisenhower, D., The press release and text of farewell speech on January 17, 1961. Available at: http://www.eisenhower.archives.gov/

2 The military spending, also called defense spending, exceeds half of the federal government's discretionary budget. Available at: Foster, J. and McChesney, R., Surveillance Capitalism, Monthly Review, July-August 2014

III. MILITARY R&D – A $100 BILLION GRAVY TRAIN

The United States spends nearly $100 billion annually on defense R&D alone. Every year, the Pentagon provides approximately $4 billion to support university research, mostly in the United States.[3]

There is growing recognition that defense spending as a whole at the current level of more than $700 billion annually3 is not sustainable in light of the massive budget deficit. However, questioning the amount is practically a taboo. Additionally, in the author's view there is virtually no examination of the nearly $100 billion allocation for defense R&D, which now exceeds amounts spent during the height of the Cold War. For example, the highest R&D budget in constant 2010 dollars was about $70 billion during Reagan's SDI project in the 1980s, according to his own analysis. The corresponding figure for the fiscal year 2020 is about $85 billion.

It is divided into several categories: basic research, applied research, and systems development. About $3 billion is allocated for basic research and $5 billion for applied research.

[3] The rest of the money – about $77 billion – is spent on system development, which is for building prototypes and limited production units for testing. The money for system development goes mostly to defense contractors.

On the one hand, because it is under the purview of "research," the author believes that the politicians find it easy to support the large spending. Everyone wants to be seen as supporting "scientific research" for national security. On the other hand, because it is categorized as R&D, including about $18 billion in classified programs, the program goals can often be defined loosely, which makes oversight difficult.

There is also a problem in how the programs are structured. Under widely used cost-plus fixed-fee contracts, the contractors are reimbursed for every penny they spend on a contract. They also get generous overhead and termination costs in the event a program is canceled, even if a contractor is at fault. The missile defense program, which is the subject of the case studies presented here, is an egregious example.

IV. HISTORY OF THE CONTROVERSIAL US MISSILE DEFENSE PROGRAM

After USSR launched the Sputnik in 1957, the notion of a "missile gap" gained currency. In response, newly elected President John F. Kennedy increased funding for missile and space programs in a big way. Soon, anti-ballistic missile (ABM), simply "missile defense," systems were on the table.

Several ABM schemes were developed in the U.S. as well as in the Soviet Union, but they were generally found to be infeasible for both technical reasons and their prohibitive cost. They were also found to be destabilizing since defense gave rise to more offense that resulted in an unprecedented arms race. The madness finally ended after the two superpowers negotiated a treaty in 1972 to ban ABM systems. It was called the ABM treaty. It stayed in force until the U.S. withdrew unilaterally in 2002.

A section of the U.S. military and its supporters outside liked the missile defense program, which they believed could help U.S. gain nuclear superiority over USSR by allowing a devastating "first-strike" capability. In theory, missile defense would render ineffective a Soviet counter attack with any forces that might survive. It would also discourage the Soviets from carrying out a surprise first-strike. However, missile defense systems were found as ineffective as they were expensive. Hence, the focus and spending for nuclear deterrence shifted elsewhere, but only temporarily.

3 Ghoshroy, S., Fact Sheet: Pentagon and the Universities, January 2011. Available at: http://demilitarize.org/fact-sheets/enfact-sheet-pentagon-universities/

After Ronald Reagan became the U.S. President in 1980, he ratcheted up the rhetoric against the Soviet Union calling it the "Evil Empire." Reagan proposed to develop a "missile shield" over the U.S. territory by launching a program called "The Strategic Defense Initiative (SDI)." It entailed deployment of sensors and interceptors based on land, sea, and space, which included, among others, high power lasers to knock down Soviet missiles. Most of it had little basis in reality, which is why the program came to be known as "Star Wars," taking after the science fiction movie by the same name.

SDI spent about $100-billion over the next ten years, or so, in the pursuit of quixotic systems. George H.W. Bush, who succeeded Reagan as President in 1989, scaled back the program by canceling most of the space based concepts, but the program survived, albeit smaller than before, and remained low-key for some years.

In author's firsthand experience, most Republicans in Congress supported missile defense, while majority of Democrats opposed it. The missile defense lobby, consisting of scientists from the defense establishment, especially the Lawrence Livermore Laboratory, their supporters in the Pentagon, and the military contractors like Boeing Aircraft, refused to give up. They kept the program alive with the help of Congressional supporters, while waiting for a better political environment to relaunch the program.

That opportunity came after the Republicans took over both Houses of Congress in 1994. Despite his initial opposition, President Clinton, facing a hostile Congress, cut a deal with the Republicans by agreeing to build a missile defense system. It was called the 3+3 program - 3 years to develop and 3 years to deploy. The author believes that it was a turning point because henceforth opposition to missile defense virtually disappeared, as a bipartisan consensus was reached in Congress.

The new program would build a rudimentary capability to stop missiles from a few so-called "rogue" nations like Iran, Iraq, Libya, and North Korea, but not a full-scale attack by Russia. It focused on developing a ground-based system to intercept intercontinental ballistic missiles (ICBMs) in the exo-atmosphere during their flight from the land-based silos to targets on the US mainland. The system, which eventually came to be known as the Ground-based Midcourse Defense (GMD), planned to deploy a so-called "hit-to-kill" technology. Under the scheme a booster rocket would launch a small interceptor, called the "Exo-Atmospheric Kill Vehicle," toward the attacking missile and destroy it by directly colliding with it. The kill vehicle design, especially its infrared seeker, that became the Achilles heel of the system, is a challenge that continues to dog the program.

Since 2001, the program has been receiving about $10 billion annually under President George Bush, Barack Obama and now Donald Trump, respectively. Altogether, including the spending for the SDI, and follow-on "keep-alive" funding in the 1990's, in the author's estimate, U.S. has spent approximately $400 billion on missile defense so far. Moreover, despite repeated test failures, it is being deployed as a battlefield weapon in Alaska, and Europe, bringing no more security, only increased tensions with both Russia and China, who are opposed to the US missile defense program.

V. CASE STUDY NO. 1

A. Ethical challenges as a participant in the SDI program

The author was an engineer for nearly 20 years in both civilian and military research. After several years at U.S. national laboratories, he had to move to the defense industry in the early 1980's, when budget cuts forced layoffs. He found employment at a research laboratory that was developing high-power lasers for missile

defense under the SDI program.

They were for both space-based missile tracking as well as high power ground-based systems for interception of ICBMs. After some time, it became apparent to many that the performance requirements for these lasers were far in excess of the capabilities of even experimental devices. In many cases, there were fundamental physics or engineering issues that seemed unsurmountable. No matter, work continued as if such challenges either did not exist, or could be overcome by throwing more money at them, regardless of the technical merits. In author's experience, this caused a great deal of consternation among the technical staff.

The author recalls a particular controversy about the estimated weight of a laser that was proposed for a space-based application. The weight was a major factor in the overall design because of launch considerations. For a specified weight, the laser would have had to perform with an efficiency that was much higher than what was possible with current technology. There were also other design parameters that could not be verified by experiment. Despite these near "show stoppers," the laboratory management went forward with the proposal that included virtually false claims about the design, and subsequently won the multi-million dollar contract. The project was terminated after two years and after several million dollars was spent, when it became clear that it would fail.

The author was disturbed by these events and attempted to bring them to the attention of his superiors, but failed. He tried also to discuss them with government program managers, but again without any success. There was much interest in keeping these programs going at all cost.

He faced ethical challenges with his own conscience on two fronts. One was his apprehension that the research could contribute to dangerous weapons. The other was the waste of taxpayer money. He was deeply conflicted about his continuing participation and looked for an opportunity to leave. As anticipated, he did not have too many options because his technical expertise in design and building of pulse power systems for high power applications was not readily transferrable. Thus, he had little marketability outside the defense business.

B. The Author Goes to Washington

In 1996, an opportunity came after the author received an Congressional Fellowship from the Institution of Electrical and Electronics Engineers (IEEE). The catch was that it was only for one year with a stipend that was less than half his salary, and no clear career path in sight. Nevertheless, after much soul-searching, the author accepted it although he was aware of the risk involved.

He obtained a position in the office of Congressman Lee Hamilton of Indiana (retired), who was then the Ranking Democrat on the House Foreign Affairs Committee. The author was told that he was the first person on the committee staff with a technical background. The author found the experience most rewarding. The experience informed his future work enormously.

After his Fellowship was over, he was offered a job on the prestigious House Armed Services Committee to work for the late Congressman Ronald Dellums, from Berkeley, California, who was its Ranking Democrat. Although, the author's stay there was short – just sixteen months - because Mr. Dellums resigned from Congress unexpectedly at the end of 1997 – the position gave him an important vantage point to observe the interplay between Congress, the military, and the defense contractors. There he also gained firsthand the nitty gritty of the defense authorization and appropriation process. He describes his experience as if he was watching how the proverbial sausage was made. Not pretty!

Even in this short time he

was able to bring to Congress's attention the technical flaws of another missile defense program called the Airborne Laser (ABL). Drawing on his earlier experience he warned the committee members about the immaturity of the laser technology. His warnings proved to be correct more than ten years later, when the program was canceled after spending several billion dollars, but failing to demonstrate its advertised capabilities – an all-too-familiar story.[4]

VI. CASE STUDY NO. 2

A. The Government Accountability Office

After leaving his Congressional staff position, he joined the US Government Accountability Office (GAO) as a Senior Analyst. He was immediately recognized for his ability to bring technical insights to GAO's analysis, which most GAO evaluators did not have. Within a couple years, he participated in several GAO reviews on military communication systems, laser weapons, electronic countermeasures, etc. It is there that he became a "whistleblower" after discovering fraud by contractors in the missile defense program.

4 Ghoshroy, S., Coming not so soon to a theater near you: laser weapons and missile defense boondoggles, Bulletin of the Atomic Scientists, November 2011.

In the author's view, GAO covered up the wrongdoing. He was the first and thus far the only whistleblower in its 98-year history. His story follows.

B. The GAO Review of Allegations of Fraud in Missile Defense

In early 2000, GAO received a request from Congressman Howard Berman, a senior Democrat from California, and a Member of the House Judiciary Committee, to review certain allegations of fraud in the missile defense program. The allegations were made by Dr. Nira Schwartz, an Israeli-born scientist, who worked at TRW, Inc., a defense contractor based in Los Angeles, which was in Mr. Berman's district.

Beginning in 1996, in order to prove the viability of the GMD system described earlier, the Missile Defense Agency (MDA) undertook a series of complex tests called the Integrated Flight Test (IFT).[5]The very first test under this series – labeled IFT1– was scheduled to take place in late 1996 or early 1997. It was alternatively dubbed as the "Sensor Flight Test" or SFT, because its goal was to demonstrate the technology for an infrared sensor for the crucial "seeker" component of the kill vehicle. The test had to be aborted because of a malfunction of the booster that was to carry the interceptor to space for the test. The rescheduled test – called IFT-1A – took place in April 1997 at a cost of $100 million. IFT-1A had a fly-by configuration, meaning the interceptor was meant to only fly by the target missile, without attempting to intercept it. The seeker was designed to collect the infrared emissions from both the target warhead and the accompanying ensemble of decoys in a simulation of the battlefield scenario. The seeker was mounted on the front of the EKV assembly, which was the payload of the booster rocket. After the failure to launch, the booster and its payload remained on the launch pad in on the Marshall Island in rather harsh weather conditions until the booster was fixed. It took a couple months following which the test renamed IFT1-A took place.

Both MDA and the contractors, Boeing and TRW, claimed the test was a total success. However, Dr. Schwartz alleged that a key component in the sensor package – an algorithm to process infrared signals collected by the sensor- did not perform as advertised by the two contractors – TRW, and Boeing. Dr. Schwartz was intimately involved in the development of the software at TRW, her employer. She was later asked to review

5 Levin, R., et al, Review of Allegations on an Early Missile Defense Flight Test, GAO Report, February, 2002, GAO-02-125

the data from the test by the Defense Criminal Investigation Service, after she sued TRW for firing her. She concluded that the test was a failure and that the contractors were lying.

Given the author's technical background and also familiarity with the missile defense systems, GAO chose him to lead the technical part of the review, which gave him wide latitude to conduct a thoroughly scientific investigation. There were also two other members from the GAO Chief Technologist's office, who worked as in-house independent reviewers.

The investigation lasted nearly two years during which time GAO received many technical briefings and many reports and other documents, both classified and unclassified. The team also interviewed scores of scientists, program managers, test evaluators, etc., both from the government and the contractors.

At the author's initiative GAO engaged consultants from outside who were experts in infrared sensor technology to evaluate the sensor performance. The author sought technical help in an appeal to scientific and engineering organizations like the American Physical Society, and his own professional organization, IEEE, for example. Unfortunately, there was little or no response. None came forward. The author found that there was reluctance to get involved because people were concerned about maintaining good relations with the Pentagon and the defense contractors.

The author says he spent numerous hours poring over classified reports and test data. Ultimately, based on what he found to be a failure of the infrared sensor itself, he concluded that the test was a failure. Curiously, this fact was known to the government's own technical reviewers like scientists at MIT's Lincoln Laboratory, but nobody had raised a flag until the GAO review.

The sensor failed to reach its operating temperature because of a malfunction in the cooling system. Consequently, it failed to collect any useful signal from the target and its accompanying decoys. The thermal noise was too high. Thus, the main objective of the test, which was to measure the infrared signatures of the target objects, could not be met.

Dr. Schwartz was likely correct in her assessment of the software since she had participated in its development and laboratory testing at TRW before the integrated flight test. However, GAO could not exactly verify her allegations since there was no useful data to test the algorithms with. But, the net result was the same. The author strongly believed that the test was a failure contrary to the claims of both the contractors as well as the Pentagon managers, who oversaw the program.

As the writing of the GAO report progressed, the author felt that GAO did not want to report truthfully the findings to Congress. Instead, it went ahead and published in February of 2002 a report that basically absolved the contractors of any wrongdoing. [5] Although the author objected to the draft report, he could not stand in the way of its publication. Instead, he struggled for the next four years urging GAO to retract its report and issue a more accurate version that reflected the true findings, which were documented by the GAO team, including the author, and subsequently fact-checked by other agency staff. After failing to do so, the author "blew the whistle" by writing a 42-page letter to Congressman Berman, in which he described in detail the cover-up at GAO and urged Congress to take action.[6]

In response to the letter, Congressman Berman made a Press Release on April 2, 2006 in which he said the following:

"The many revelations in Mr. Ghoshroy's letter speak directly to the integrity of the General Accounting Office as well as the efficacy of the missile defense program and

6 Ghoshroy, S., Letter to Rep. Howard Berman, December 19, 2005.Available at: http://pogoarchives.org/m/gp/gp-Ghosroy-12192005.pdf

they must be further investigated." He continued, "Toward that end I am sending Mr. Ghoshroy's letter to the Armed Services Committee and the Government Reform Committee and urging them to launch an investigation."

The New York Times published a story about the cover-up by the veteran science writer William J. (Bill) Broad. It said that GAO, the congressional "watchdog" itself, stood accused of dereliction of duty by one of its own.[7]

C. The whistle fell on deaf ears

Unfortunately, Congress failed to take any action whatsoever. There was no response to Representative Berman's call for action even though he was joined by Senator Charles Grassley (Republican, Iowa). Nothing at all happened in the House. At a Senate subcommittee hearing for the fiscal year 2007 appropriation for the legislative branch, the Committee Chairman, Senator Wayne Allard (Republican, CO, retired), asked the GAO chief David Walker some perfunctory questions about the New York Times story. The author was not invited to testify at the hearing. He says that one of the committee staff members called him a day or two earlier. He was asked to submit any questions for Mr. Walker, if he wished, which he did. However, from the transcript of the hearing he obtained later, he found that the Chairman did not ask any of his questions.

As for the press, several major newspapers around the world reprinted the New York Times story, and there were also some editorial commentaries. However, strangely, not a single journalist from either TV or print media contacted him. The so-called whistle-blowers advocacy groups did not offer any support whatsoever. There was one exception, the Project on Government Oversight based in Washington, DC. It supported him initially, but dropped the matter quickly after his letter to Congressman Berman was released.

Yet, the author felt that the lack of any response from the scientific and engineering community was more disappointing for him. He feels that IEEE-USA treated him like a pariah and practically cut off all contacts. Ironically, only a short time ago, he was one of the "success stories" of the IEEE Congressional Fellowship program, and Chaired the Fellows Selection Committee for a term. Similarly, the American Association for the Advancement of Science, with which the author had many interactions during and after his Congressional Fellowship, politely shunned him. So did the Union of Concerned Scientists. Incidentally, the two latter organizations named above boast of programs for the protection of scientists and engineers, who face retaliation at workplace for their ethical actions. They did nothing to help him.

The author says his biggest source of moral support was from Mr. Robert (Bob) Blumenfield, who was the Chief of Staff in Congressman Berman's district office in Los Angeles. He is now a prominent City Councilor in Los Angeles. He was the real force behind Mr. Berman's request for the GAO investigation. The author interacted with him frequently during the long investigation and after he decided to blow the whistle. Mr. Blumenfield was instrumental in warning GAO from firing him. The author would like to express his deepest gratitude toward him. In the end, however, without Mr. Berman's lifelong interest in fighting fraud in government, this would not have happened. He deserves a great deal of credit.

The author believes that GAO did not fire him because they did not want to antagonize Congressman Berman. But the agency punished mr. Ghoshroy by not allowing him to work any longer on defense programs, where his expertise lay. Most senior managers boycotted him. It effectively ended his career

7 Broad, W., Accountability Office Finds Itself Accused, The New York Times, April 2, 2006: https://www.nytimes.com/2006/04/02/washington/accountability-office-finds-itself-accused.html

in government.

Another person who was a great source of support to the author is Theodore Postol, who is an Emeritus Professor at MIT. Despite strong opposition from his department head, Professor Harvey Sapolsky, he made it possible for the author to obtain grant funding for some time from the MacArthur Foundation so that he could leave GAO and join MIT to embark on a career in academic research and activism.

VII. CONCLUSION

The achievement of the author's work was clearly the public airing of fraud and the waste of taxpayer money in defense R&D programs as well as the corrupt practices of the organizations, and the people involved. He found that exposing fraud in defense programs was very difficult due to entrenched interests and the secrecy. For example, Congress paid little attention to his findings, which he detailed in a 42-page open letter. He was also victimized at his work after he went public. The greatest lesson learned was that it was a lonely struggle since the author received no support from the technical community. Regardless, the author is proud of his actions because the social implications of wasteful military spending are clear. For example, hundreds of billions of dollars are spent on missile defense and nuclear weapons, but millions of Americans go without health care. Whistle blowers like Daniel Ellsberg and Edward Snowden have helped strengthen US democracy by bringing to light secret actions of the government. The author expects that there will be many future whistle blowers, who might follow their conscience and expose wrongdoing whether in the executive branch or the private sector. His advice to them is to follow a careful and disciplined path, which will require patience, attention to the facts, and ultimately a readiness to accept serious personal hardships. Teaching ethics in the abstract is not sufficient. Real life experiences like the author's should be included in the curriculum. IEEE should set up a task force to study what role it can play in the future to help its members who face ethical challenges.

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