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REFLECTIONS from BEHIND the REVOLVING DOOR

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Introduction and Overview

We all, of course, would like to have defense acquisition in the United States improved. Every member of the U.S. armed forces--if not every American taxpayer--has a clear interest in seeing the process conducted as efficiently, and ethically, as possible. Progress in this direction is a laudable goal with which few would, or plausibly could, quarrel.

Practical measures even somewhat likely to bring about such progress, however, are not at all as self evident or obvious as one might hope. While many reasons could be suggested for thinking this is so, the present paper will concentrate on just one of them: the untidy fact that many of the day-to-day ethical dilemmas¹ faced by those involved in the defense acquisition process are not as unambiguously "black" or "white" as most people tend to presume.

The thrust of this paper, therefore, will be to offer some reflections, vignettes, and insights--mostly from the industry side of the so-called "revolving door"--into the true complexities of the defense-acquisition system as it operates today. The point will not be to suggest that we should despair over the prospects of making the system more efficient and more ethical. Rather, it will be to argue that if genuine progress is to be achieved over the long haul, there are many real-world, ethical complexities that need to be understood and taken into account.

One assumption that motivates this cautionary line of argument is a strong suspicion that promulgating new, additional, or more-comprehensive restrictions and rules of conduct for defense procurement, however well intentioned, may not necessarily improve either efficiency or reduce unethical behavior. This assumption has a strongly pragmatic flavor. Nonetheless, it is not without some basis in

1. The interpretation of the term "ethics" presumed throughout this paper will be that of a set of rules of professional conduct (Raziel Abelson and Kai Nielsen, "Ethics, History of," *Encyclopedia of Philosophy*, ed. Paul Edwards (New York: Macmillan, 1967), Vol. 3, pp. 81-2).

Draft: January 4, 1991

both recent and historical experience. There is currently some modicum of agreement on all sides that, in the words of Under Secretary of Defense Donald Atwood, the present U.S. acquisition system is loaded with burdensome restrictions "that have nothing to do with the ultimate performance" the Defense Department is seeking.² Moreover, the Hoover Commission in 1949 was simply the first post-World War II panel of "wise men," the most recent of which was the 1986 Packard Commission, intended to reform the acquisition process.³ Yet progress toward an acquisition system basically immune to major programmatic errors or failures has, arguably, been minimal. As Secretary of Defense Richard Cheney recently observed, everyone is always searching for "the silver bullet that's going to solve the acquisition problem," but no one has "found it yet."⁴

Metaphors and Assumptions

Because of the increasingly confrontational atmosphere surrounding defense acquisition, it seems best to begin with some words of caution about some of the conceptual metaphors that may be inadvertently brought to the discussion. For example, the phrase "waste, fraud, and abuse" tends to roll rather effortlessly off the tongue these days whenever the acquisition system is mentioned. Yet it runs together some things we surely ought to keep separate--at least until proven otherwise. Waste in the sense of inept management or honest mistakes is certainly something we all want kept to a minimum. On the other hand, developmental efforts at the edge of technology without waste, in the sense of engineering solutions that do not quite pan out, presume levels of foresight and perfection that are almost certainly unattainable in this world. "Unavoidable" waste of this sort is a far cry from the illegality or unethical conduct implied by "fraud and abuse." Such things cannot be run casually together if we are to think clearly about the ethics of defense procurement.

Metaphors, as George Lakoff and Mark Johnson have argued, are both pervasive and basic to our understanding of experience; they are "one of our most important tools for trying to comprehend partially what cannot be comprehended totally."⁵ If there has ever been something truly difficult for any single person to

2. John D. Morrocco, "Defense Dept. Moves to Simplify Procurement Rules, Regulations," *Aviation Week and Space Technology*, 22 January 1990, p. 73.

3. William F. Paul, "Contractors, Pentagon Must Restore Trust to Preserve Defense Industry," *Aviation Week and Space Technology*, 21 May 1990, p. 135.

4. "Cheney Mulls A-12 Mess, Wonders What Else He Hasn't Been Told About," *Defense Week*, 17 December 1990, p. 8.

5. George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago, 1979), pp. 193 and 210-11.

Draft: January 4, 1991

comprehend completely, it has got to be the U.S. defense-acquisition system. In this regard, one of the more widespread popular metaphors for getting our arms around the subject is to equate defense spending--particularly on advanced weaponry--with waste in the sense of adding nothing to society or progress.⁶ Again, however, caution seems warranted on at least two levels.

Take composite materials made from combinations like carbon fiber and epoxy, or hexacelsian glass and silicon carbide. As *The Economist* recently observed, it is not just that some of these "designer" materials can replace metals. In the long run they will be "enabling" technologies for "doing things that cannot be done any other way"--for example, building a bridge across the Strait of Gibraltar.⁷ In this regard, *The Economist's* firm prediction is that, much as the industrial revolution saw production of metal products move from the craftsman's workshop to the factory floor and the artisan's carefully honed skills give way to machines, composite materials will travel the same path "and set off a revolution of their own."⁸ And the point not to be forgotten, of course, is that these materials first reached feasibility in the laboratories of U.S. aerospace manufacturers working on advanced aircraft programs underwritten and funded by the Department of Defense (DoD).

There is, moreover, a deeper sense in which U.S. defense spending over the last several decades had value over and above the direct utility in actual combat of the weapons it produced. In the main, the U.S.-Soviet Cold War, whose end has freed Eastern Europe from Soviet domination and produced U.S.-Soviet cooperation in the Persian Gulf, was a long-term competition in peacetime. Since the National Security Council NSC-68 in April 1950, a central tenet of American defense policy vis-a-vis the USSR has been to "enlarge upon our technical superiority by accelerated exploitation of the scientific potential of the United States and our allies," rather than to match the Soviets tank for tank, ship for ship, plane for plane, and nuclear missile for nuclear missile.⁹ The principal battles and cam-

6. A complication here, of course, is that many who believe on ideological grounds that military spending is an inherent social evil pursue its reduction by accusing the acquisition system of being ill-managed, wasteful, and corrupt. Such intentional mixing of ideological value judgments and managerial concerns tends, at the least, to cloud, rather than clarify, the underlying ethical issues.

7. "The Right Stuff: Composite Materials Will Make It One Day," *The Economist*, 24 November 1990, pp. 95 and 97.

8. "The Right Stuff: Composite Materials Will Make It One Day," p. 97. Among other things, *The Economist's* assessment of the revolutionary potential of composite materials undercuts the now-fashionable shibboleth that "military R & D has become an inefficient means of generating commercial spin-offs" (Robert B. Reich, "The Quiet Path to Technological Preeminence," *Scientific American*, October 1989, p. 44).

9. Thomas H. Etzold and John Lewis Gaddis, *Containment: Documents on American Policy and Strategy, 1945-1950* (New York: Columbia University Press, 1978), p. 433. NSC-68, titled "United States Objectives and Program for National Security," outlined the basic containment strategy that the U.S. largely pursued throughout the U.S.-Soviet Cold War.

Draft: January 4, 1991

paings of this long-term competition, therefore, did not involve direct combat between U.S. and Soviet forces. Instead, they were primarily waged between the Soviet Ministry of Defense and DoD, between Soviet and American military services, and between U.S. defense manufacturers and Soviet design bureaus. The center of gravity of this contest lay in each side's capacity to produce and deploy more advanced weaponry than the other, thereby posing a credible nuclear threat to the other's homeland. And, especially in the case of nuclear war, the substitution of this sort of "peacetime competition" for actual combat was surely an enormous blessing. In the end, though, the burden this competition imposed on the Soviets' command economy brought the Soviet Union, by the mid-1980s, to the brink of economic disaster, and forced the USSR's leaders to seek cooperation with the West rather than continued confrontation.

This history is not offered to suggest that acquisition abuses during the Cold War can now be ignored because we won. Illegal behavior should be punished and unethical conduct discouraged independent of the outcome of that contest. Nevertheless, the West's victory does suggest that U.S. defense efforts during those decades were neither wholly wasteful nor wholly evil. The enterprise of containment produced palpable goods. The triumphant image of the Berlin wall tumbling down last year speaks volumes in this regard, and the accelerated exploitation of advanced military technology in the U.S. played an important role in that result. How and why the West won the Cold War, therefore, is not irrelevant to judgments about the aggregate value of past U.S. defense spending.

*The Revolving Door*¹⁰

There is one other popular image concerning the U.S. military-procurement system that deserves discussion. It has to do with the presumption of so deep a conflict of interest between military or government service and subsequent employment by a defense contractor as to argue compellingly for closing the so-called revolving door once and for all--particularly to retired servicemen and service-

10. Because JSCOPE (Joint Services Conference on Professional Ethics) has been historically concerned with the ethics of serving members of the military, discussion of the revolving door will be limited to one aspect of the phenomenon: former military members going to work with the defense industry. The revolving door, however, swings both ways. Another aspect of this so-called problem would be members of industry entering government service for a time and, as Norman Augustine has done, later returning to the defense industry. (As of this writing, Augustine was the chief executive officer of Martin Marietta; he has also served in various government posts, including Undersecretary of the Army.) While the discussion in this section will not deal explicitly with this aspect of the revolving door, the kinds of arguments and considerations raised regarding former military members going to work for industry could also be extended to other cases such as that exemplified by Augustine. Another such case would be a former military officer going to industry and, later, returning to the Pentagon in a civilian post with the Office of the Secretary of Defense or one of the service staffs.

Draft: January 4, 1991

women. One obvious question about this attitude, however, would be whether the possibility of abuse by some warrants closing the door to everyone in this category--particularly if clear-cut abuse is legally punishable.¹¹ To offer one potential counterexample, is it reasonable, or right, to restrict the right of individuals to seek employment with a defense contractor after leaving military service in hopes of improving the acquisition system, or reducing the number of ethical transgressions? To suggest a second, we do not seriously consider banning driving on the grounds that some individuals will not only abuse the privilege, but cause the deaths of innocent individuals as a result of their abuse.

The first prospective counterexample raises the issue of punishing, or discriminating against, a group of individuals on the basis of the perceived sins of some of its members. Needless to say, doing so would surely run against the grain of long-standing American distaste for job discrimination or the limitation of economic opportunities. Moreover, there are some practical questions. Are we talking about a situation in which a very small percentage of former military personnel who later go to work for defense contractors act illegally or unethically? Or are we talking about widespread abuse by a much larger percentage of individuals? Moreover, should the ban against industry employment only extend to government personnel retiring from acquisition jobs? Or should we include all government employees? And, for those affected, should the ban only cover conflict-of-interest employment with industry, or all jobs?

The second counterexample simply makes the point that the prospect--indeed, even the certainty--that a privilege will be abused, or have evil consequences, need not necessarily entail its prohibition. Admittedly, driving could be viewed as having broad benefits which offset its adverse consequences. But could not the same be said of individuals going to work for industry after leaving the government?

11. The Packard Commission's final report defined the "revolving door" as "the movement of a DoD acquisition employee into a position with a private company for whose government contracts he has or had some official responsibility" (*A Quest for Excellence: Final Report to the President by the President's Blue Ribbon Commission on Defense Management*, June 1986, p. 96). This fairly narrow interpretation of the "revolving door" is aimed at those DoD employees who, if they went to work for a given defense contractor, would have a direct financial conflict of interest. Within this context, the Packard Commission's basic recommendation on the "revolving door" was to emphasize "improving compliance with existing standards, not...defining new or more stringent standards" (*Ibid.*). In reviewing the statutory restrictions which existed in 1986 on what federal employees and retired military officers could do once they left government, the Packard Commission also expressed doubts about the wisdom of Public Law 99-145, and comparable measures then pending in Congress, which significantly departed from prior law "in attempting to define as criminal conduct certain post-government employment *per se*" (*Ibid.*, p. 97). The specific concerns raised were the highly selective nature of these restrictions as well as the serious, and unresolved, problems of definition that they posed regarding "which DoD personnel should be covered and precisely what sort of exposure to a contractor should lead to the employment prohibition" (*Ibid.*).

Draft: January 4, 1991

Both counterexamples implicitly presume, of course, that it is in fact possible for individuals to transition from military service to employment by a defense contractor and subsequently conduct themselves ethically. Here the present author, who has in fact gone from a career in the military to employment with an aerospace-defense manufacturer, can at least offer up personal experience supportive of this possibility. The small, analytic organization in which he has worked for some five years has been fastidiously run, with the concurrence of everyone involved, in accordance with the pragmatic principle: If you can't stand to see it on the front page of the *Washington Post*, don't do it.

As stated, this principle sounds rather pragmatic. One may be tempted, therefore, to object that while it clearly cautions against illegal or publicly embarrassing behavior, it hardly amounts to an ethical rule or standard of conduct. The pragmatic tone aside, however, the spirit of the injunction to avoid anything one would not want to see on the front page of the *Washington Post* is, for all intents and purposes, indistinguishable from the Defense Department's general standard of ethical conduct which enjoins DoD personnel to "avoid any circumstance, whether or not expressly prohibited, that might create the 'appearance' of impropriety."¹² Further, within the analytic organization in question, that "ethical" interpretation has been precisely the one taken. The individual who first articulated the front-page-of-the-*Post* criterion within the group was a Harvard Business School PhD and retired U.S. Navy captain who had reached much the same conclusion about ethics in business as Britain's Marks and Spencer: namely that "attention to ethics means higher profits."¹³ So we adhered to the front-page-of-the-*Post* principle not so much because it was in some sense imposed, but because it made both pragmatic and ethical sense to do so. Pragmatically, the present author at least was certainly persuaded that adhering to it served the long-term best interests of both the corporation and the government. And, from an ethical perspective, it provided an important protection. Those of us who hoped to be able to earn our pay with a defense contractor and still adhere to the standards of ethical conduct we had observed in the military, as well as in other government jobs, saw it as providing a persuasive rationale for being able to say "no" to activities that might compromise those standards.

Moreover, from the utilitarian standpoint of the greatest good for the greatest number, an additional fallout was that the accumulated organizational and combat experience from twenty-plus years in the military of a number of individuals was not lost to the enterprise of national defense. In this regard, it is im-

12. *A Quest for Excellence*, p. 94.

13. "In Good We Trust," *The Economist*, 8 September 1990, p. 101.

Draft: January 4, 1991

portant to recognize that the complete loss of such expertise to industry would itself be likely to have adverse consequences for acquisition. There are aspects and critical issues involved in the design of major weapon systems that cannot be readily written down and communicated on paper, especially to engineers with purely civilian backgrounds. Weapons-employment doctrine, the suitability of aircraft for operations from an aircraft carrier, and situation awareness in air-to-air combat provide obvious examples of such knowledge. Take carrier suitability. A Navy RFP (request for proposal) for a new fighter or attack-aircraft will include very detailed specifications aimed at carrier suitability. Nevertheless, there are aspects of carrier suitability which are nearly impossible to grasp if one has never been around carrier operations. Consequently, it is quite possible for engineers to produce a design that meets every individual technical specification, yet still fails to satisfy the overall carrier-suitability goal. The broad, intuitive understanding of real-world requirements and operational contexts needed to appreciate things not explicitly written down in the RFP is hard to acquire at Stanford or the Massachusetts Institute of Technology, and no RFP can include everything that might be important to every possible design solution.

At an even more elementary level, there is the additional fact that individuals with previous military experience tend to make good employees. They usually work hard, they tend to be output (or "mission") oriented, and, again, they come with insights and real-world military experience which few engineers with purely civilian backgrounds will ever match. So there are entirely defensible and, if you will, innocent reasons why you find a lot of retired military people working in defense firms.

A variant of the presumption against former military personnel going to work for defense manufacturers would perhaps be that the atmosphere in the U.S. defense industry is so corrupt that even the most stalwart of them would quickly succumb. This premise obviously takes a dim view of the ethical fiber of the average military officer or enlisted man--individuals who are regularly entrusted, while on active duty, with multimillion-dollar programs, multimillion-dollar pieces of equipment, and, even, nuclear weapons. It also seems psychologically implausible. Commissioned and noncommissioned officers who manage to behave ethically for twenty-plus years on active duty are not likely to turn into crooks overnight for the simple reason that so fundamental a change in behavior at that age is rare.

A final difficulty with the impulse to close the revolving door concerns the fineness of the ethical discrimination which may be required to bound the prohibition in some sensible way. If it truly is unethical for a former Air Force pilot to go

Draft: January 4, 1991

to work for a defense manufacturer, then would it not also be unethical for that individual to fly for a commercial airline upon retirement?

This potential counterexample can perhaps be ruled out on the following grounds. The retired pilot's use of his flying skills in the service of United or Pan American does not directly affect government acquisition decisions or spending, whereas his employment by Boeing or General Dynamics could--even if his contribution was strictly to enable Boeing or General Dynamics to offer DoD a better product.

Consider, however, the case of a former military officer with acquisition experience going to work for a Wall Street investment firm dealing heavily in aerospace stocks, or providing advice on corporate takeovers. In this case, the individual's expertise could conceivably have far greater impact on DoD acquisition decisions than if he or she had gone to work helping a given military-aircraft manufacturer with, say, cockpit interfaces for a future fighter, or operational analysis in support of some other acquisition program. Yet to rule out employment by the Wall Street investment firm, as well as with aerospace companies, seems to put us on a slippery slope toward increasingly fine and debatable prohibitions which, in the long run, would tend to penalize military service. Particularly in light of the "up-or-out" personnel policies the U.S. military services have pursued since World War II--which, in effect, "turn out" many middle-management personnel just as they reach the peak of their productivity--it is not self evident that doing so would necessarily be in the best interests of national defense.

The Peculiar Nature of the U.S. Defense Industry

Defense contractors in the business of building major weapon systems for the U.S. Government (USG) are basically confronted with a situation approaching a one-customer market. The government rightly perceives that the unrestricted transfer of advanced weaponry abroad could endanger the common defense; the sale of such items abroad is an integral part of American foreign policy, and, as a result, subject to approval and regulation by the USG; and, for the vast majority of weapon systems, the federal government dictates the broad requirements, imposes detailed specifications, and mandates complex regulatory and oversight practices. Demand in such a market arrangement is altogether different from that which exists for consumer goods such as TVs, cars, or groceries. It is ultimately driven by the political good of "providing for the common defense," not by the economic needs and preferences of numerous individual customers. Moreover, the government can also set prices, regulate profit margins, establish the quantities of various

Draft: January 4, 1991

weapons that will be bought, "tax" the foreign sales of such items by recouping the costs of nonrecurring research and development, and even transfer the design-and-engineering data, on which a given company's competitive advantage is based, to its competitors.

For example, the costs of developing major weapon systems today are such that defense contractors cannot simply go off, build a "better mousetrap," and then offer it to the U.S. government in the expectation that a superior or cheaper product will sell itself. In the aerospace industry, Northrop's ill-fated F-20 was the last serious attempt to build a better lightweight fighter independent of the highly competitive and highly regulated defense acquisition process, and it basically failed at a cost to Northrop of some \$1.2 billion. It is unlikely that any other major defense contractor will attempt another F-20 in this century.

Such episodes are not without their long-term costs. One of the government's enduring problems in this regard is to find ways of promoting useful competition within the defense industry without driving all but one or two of the competitors out of business.

In an even broader sense, the defense-acquisition problem is to meld the best features of American free enterprise with the conflicting requirements of a single DoD customer, the large investments needed for the development of major weapon systems embodying advanced technology, and the large organizations required to carry out such developments.¹⁴ Yet it is worth remarking that our understanding of the complex interplay of talented people, relatively free economic institutions, markets, and evolving technology which, since the mid-1700s, has fueled the "Western economic miracle" is, arguably, preliminary and incomplete.¹⁵ This fact alone should caution against radical surgery on the existing acquisition system unless we are fairly confident that the operation is likely to improve the patient's prospects.

Another observation about the U.S. defense industry is that profit is by no means the sole goal pursued by individuals, and groups of individuals, within many of these companies. As with any large organization or institution, the people and groups within it bring many goals and aspirations to the work place besides profit. The people out on the production lines who build F-18s or M-1 tanks tend to think

14. The Soviet approach has been to make the companies part of the government bureaucracy, a solution which runs deeply counter to American instincts and values. In light of the present state of the Soviet economy, this approach would not appear to be a wise one to embrace.

15. See Nathan Rosenberg and L. E. Birdzell, Jr., "Science, Technology and the Western Miracle," *Scientific American*, November 1990, pp. 42 and 54.

Draft: January 4, 1991

they are doing their part to defend the country, and the present author's (albeit limited) experience suggests that most of them take pride in doing the best job they can. They are also taxpayers, work in jobs less protected than those of most in the military, and no more enjoy being pilloried in the press with the sins of a handful of their coworkers than would anyone else. Furthermore, engineers and designers, typically, are more interested in the challenge of solving advanced design, technology, and manufacturing problems than they are in how much profit their corporation makes--so long as the corporate ship remains afloat. Their day-to-day focus tends to be on moving from one challenging problem to the next. In short, the greed and venality commonly assumed in the press or at Congressional hearings to pervade major defense corporations is something that is often hard to find when you examine individuals and elements within most of these companies. This is not to say that it does not exist. After all, the people who work for, or manage, major defense companies are subject to the same human frailties and failings as anyone else, including professional military officers.

It can perhaps be objected that these observations confuse the motivations of individual employees with those of corporate entities. As a practical matter, however, corporations are composed of individuals, and the corporate entity's incentives to insure that its employees behave ethically are largely legal. A company's contractual relations with the U.S. government are primarily governed through things like defense-acquisition regulations, and the corporation's incentives for enforcing ethical conduct by its employees are mainly secured through the contractual options and legal sanctions available to the government.

Currently changes are underway to increase the penalties and criminal liability of corporations, corporate officers, and corporate managers for the conduct of their employees.¹⁶ Such changes represent an understandable attempt to link corporate policies and management more closely to the conduct of individuals. Nevertheless, human ingenuity being what it is, there have always been limits to our ability to legislate right conduct, and there are many "hidden costs" associated with the attempt to do so in defense acquisition.¹⁷ These facts underscore the long-term importance to the U.S. acquisition system of helping defense contractors develop robust corporate values, as well as encouraging them to provide individual managers and employees with strong incentives to do the right thing. Progress

16. For example, new guidelines from the U.S. Sentencing Commission, scheduled to go into effect on 1 November 1991, could increase corporate penalties by an order of magnitude or more (Paul M. Barrett, "Corporate Criminals Face Stiffer Federal Fines under Sentencing Guidelines Expected for 1991," *The Wall Street Journal*, 11 December 1990, p. A20).

17. Prescribing "mandatory" ethics training for long-time employees, for example, initially tends to be greeted with the question: "Doesn't management trust us anymore?"

Draft: January 4, 1991

along these lines, however, is much more difficult than legislating stiffer criminal penalties for wrongdoing.¹⁸

Some Defense-Acquisition Ethical Condundrums

The deeper problem, however, is the complexity of the ethical issues involved. The following situations are offered to illustrate the range of the difficulties.

Changing the Rules of the Competition in Midstream: Consider a competition for the development of a Mach 3, long-range interceptor in which the Air Force specifies in the RFP that the design have two engines. Suppose, next, that one competitor submits a design meeting these requirements, while the other opts for a "noncompliant" single-engine solution. The problem that now emerges is that the two-engine design is, as any good aeronautical engineer could tell you, likely to be very large and very heavy (and, consequently, very expensive), whereas the single-engine solution, particularly if it was somewhat innovative, would be more the size and weight of traditional century-series fighters. What ought the Air Force to do? To award the development contract to the company which submitted the single-engine design would be to breach the rules of the competition; the government would not have "kept its word" to industry. Yet doing so would avoid the delays and additional expense to the taxpayers of re-competing the program. And what if doing so appeared, in the circumstances, to be the Air Force's only hope of getting the airplane it really needed? One can see a prima facie duty to keep faith with the "contract" of the RFP. But pilots especially will be inclined to see a similar obligation to jettison the RFP regardless and go for the better design. Which, then, is the greater good? And on what grounds might choosing one obligation at the expense of the other be justified?

Weapons Development Near the "Leading Edge" of Technology: Major weapon-system developments--particularly if they push the edge of technology--inevitably face substantial technical risks at the outset. In the cases of the SR-71, the B-2, the A-12, and many other developments, there were major technical challenges, risks, and uncertainties when full-scale development (FSD) was begun. In such circumstances, there could be considerable uncertainty at the outset whether a plane could be designed, or

18. In this regard, it seems plausible to speculate that if, in the long run, more cooperation and less confrontation is preferable in U.S.-Soviet relations, the same may be true of government-industry relations.

Draft: January 4, 1991

produced, which would meet the desired performance specifications for the planned cost. Indeed, what is generally predictable in such circumstances is that such risks will probably, somewhere along the way, entail slips in schedule, increases in cost, and, perhaps, some reductions in performance. The ethical dilemma which these realities pose can perhaps be best summarized by the following questions. Given the uncertainties of such developments, is it ethical for DoD to solicit offers for a fixed-price FSD contract? And to what extent might it be ethical for defense manufacturers to submit proposals for such a solicitation?

Cost Estimates in the Face of Substantial Uncertainty: Another fact about pushing the edge of technology in developing military weapons is that the contractor faces considerable risk and uncertainty in submitting cost estimates for a given program. At the same time, the government understandably wants the lowest possible price. The resulting tension in contractor cost estimates is obvious. Given a job which the contractor's best cost-estimating methodology indicates will require 100,000 man-hours with a 75% likelihood of meeting cost, schedule, and performance, is it unethical to accept a government-encouraged "management challenge" to do the job with 80,000 man-hours and only a 65% confidence level of meeting cost, schedule, and performance?

Second Sourcing: More than one defense contractor, having invested research and development resources in a "better mousetrap," has been forced to transfer that technology to a competitor in order to provide the Defense Department with a second source--usually with guarantees of some minimum percentage of subsequent production lots to the original contractor. Besides the obvious loss of competitive advantage, there have been instances in which such second sourcing has been followed by a "winner-take-all" price competition for the remainder of the production run, and the originator of the technology has ended up losing. Because industry profits stem from production rather than technical innovation per se, is such a competition ethical--even in the name of lower prices for DoD?

What these examples illustrate are the fine-grained and perplexing ethical dilemmas which characterize the defense-acquisition process. Day-to-day decisions by engineers, cost-analysts, managers, and other individuals within defense firms are seldom as ethically "black" or "white" as outside observers tend to assume. An important, but often overlooked, fact is that the government customer and the corporate producers of weapons are entwined with one another in ways that make it difficult to apply normal free-market concepts. Yet members of Congress, the

Draft: January 4, 1991

Department of Defense, the media, and even the public frequently endeavor to judge the behavior of defense contractors by the same standards one would plausibly apply to Sears or Coca Cola. If we are to think clearly or fruitfully about the ethics of defense acquisition, these sorts of differences need to be better understood, and their ethical implications more carefully thought through.