

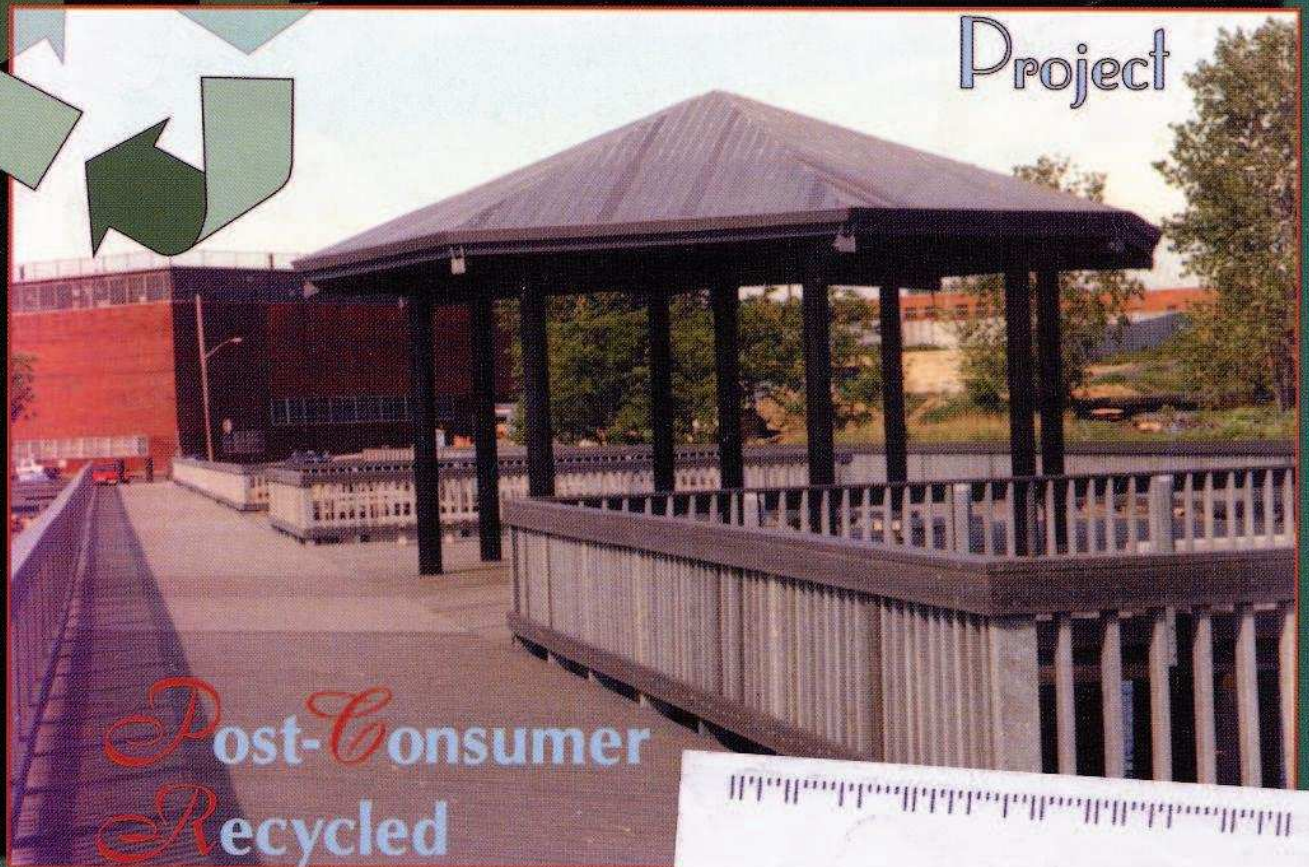
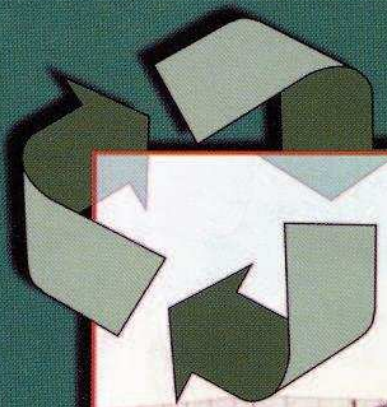
# Cost Engineering

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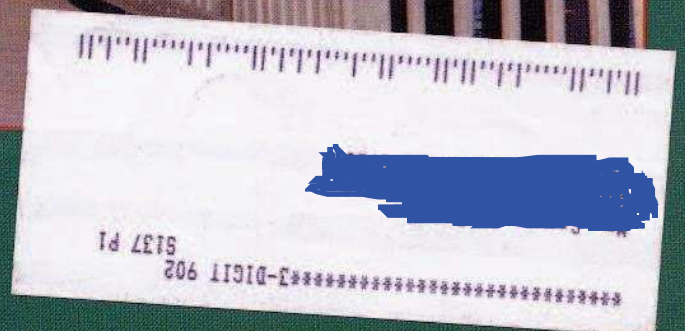
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# The Challenge of Change

Sarwar A. Samad, Chair, Aerospace Committee

**Z**bigniew Brzezinski, former US Presidential advisor, once described the competition between the United States and the Soviet Union as "a two-nation contest for nothing less than global dominance." Indeed, for the last 5 decades, every aspect of the US defense industries was shaped by this "competition." Actually, policies about defense objectives and types of weapons were shaped by the need to match or surpass Soviet military capabilities. Consequently, the relationship between the US aerospace industry and the US military has been very close; the US military establishment reacted to what was going on in the Soviet Union and then placed orders for new weapons.

The US is the world leader in the aerospace industry. It has the largest aerospace market; however, the industry is currently going through a dramatic change because of the collapse of the Soviet threat. From the fall of the Berlin Wall in November 1989 to the formal disintegration of the Soviet Union in December 1991, the foundation of postwar US defense planning—the need to compete and contain Soviet expansion—imploded. Indeed, many experts and members of the US Congress have called for cuts in defense spending for the next 5 years and for the conversion of the aerospace industry in order to save jobs. The historical record tells us that this simply won't happen. Although this article does not go into a detailed discussion of the history of the US aerospace industry, a few words are needed to provide some perspective on the industry's future.

Historical data shows that the US government has significantly reduced defense spending several times during the past 50 years, including at the ends of World War II, the Korean War, and the Vietnam War. Yet, the US government and officials in the defense industry have not learned anything from these earlier experiences. This is certainly the case with respect to the conversion of military industry to civilian industry. Although many public officials believe that they have successfully transformed "guns" into "butter" at the end of every major conflict, the record does not support this claim.

At the end of World War II, the US government owned most of the country's industrial base, including 90 percent of the synthetics, rubber, aircraft, and magnesium industries and over 50 percent of the aluminum and machine-tool industries. This gave the US government a tremendous responsibility for the future direction of the American economy, as well as for employment. Consequently, its conversion programs directly affected not only the communities where defense plants were located, but the country as a whole. At the end of the war, the government appointed teams of experts to study the defense industry, including aerospace, and the possibility of converting military plants into civilian factories. The result of their report was that it was difficult, if not impossible, to convert these industries into civilian ones. Indeed, rather

than convert, the US government and the defense industry agreed to dump billions of dollars' worth of machine tools in the ocean and to rebuild the economy anew. With the outbreak of the Korean War in 1950, a large part of the industrial defense base that had been preserved was mobilized.

Perhaps of more relevance to contemporary circumstances is what happened after the Vietnam War. The aerospace industry had a difficult time. On the macroeconomic level, the US economy performed badly in the 1970s, suffering from that fatal mix of inflation and stagnation dubbed "stagflation." Scrambling for new niches in this dismal environment, the aerospace industry entered a variety of businesses, from building buses (Grumman) to bathtubs (Boeing). For its part, General Dynamics went on to lose money in shipbuilding and mining.



Overall, the result of aerospace companies entering other commercial areas has not been a good one. Government advocates of aerospace diversification would do well to recall that a booming commercial sector already exists. Awarding contracts for civilian work to defense firms in an effort to "force" them to convert, as many experts and government officials have proposed, would hurt the existing commercial industries already serving those needs.

Furthermore, in 1995, the industry experienced the sharpest decline since the late 1960s, when all aerospace industries were simultaneously engaged in the Apollo Space Program, Vietnam War production, and the large-scale manufacture of wide-body jetliners. In short, there is nothing in the industry's experience to give us optimism about the potential for converting "defense" industries into "civilian" industries at the plant level. In addition, on the basis of the force reduction program outlined by the US Secretary of Defense, US Department of Defense aerospace sales will drop by the end of this century to roughly 25 percent below the 1995 level, in real terms. This is a very serious reduction and will pose a serious problem for the organizations most heavily committed to defense work. This suggests that, in the short run, defense downsizing will be painful to many of those who have given their careers to the military and its supporting industries. In order to help these workers transfer to new careers, the US government should help with retraining programs and perhaps some direct financial assistance. But the government should not give false hope that jobs and plants can be maintained and converted. The historical record suggests that this simply does not happen.

Any attempt to predict the future of the aerospace industry is uncertain, because almost two-thirds of the industry's work load is in government contracts, and Congressional emphasis on deficit-cutting has had, and probably will continue to have, a significant effect on defense and aerospace funding. Indeed, looking back for the last decade, serious threats to the industry's financial health have been created by a number of legislative and regulatory changes in defense programs. However, data tells us that the US will always need a strong aerospace capability. In fact, the disintegration of the Soviet Union and the recent Gulf War showed that the US government's investment in aerospace has been sound.

**T**he competition for global dominance was, is, and will remain the main factor that dictates the fate of the aerospace industry. In fact, recent events have encouraged aerospace industry officials to believe that some help will be forthcoming. I strongly believe that the widening range of opportunities for space exploration, together with continuing public support for a strong system of defense, will result in appropriations levels—and thus aerospace industry contracts—sufficient to maintain a healthy aerospace workload into the next century. ♦

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**On the Cover:** The Tiffany Street Pier, an all-recycled plastic structure, New York City, NY, USA. Photo courtesy of Charles N. Kriss, project engineer, Tiffany Street Pier.