

**The Metamorphosis of the Defense
Industry**

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THE METAMORPHOSIS OF THE DEFENSE INDUSTRY

ABSTRACT

The downsizing of the United States defense industry in recent years had a multitude of effects on defense and defense-related manufacturers. Besides the inevitable loss of jobs, these firms essentially had to reinvent themselves in order to compete in the commercial sector more effectively. Moreover, the defense cutbacks also resulted in implications for the U.S. as a whole. These include questionable preparedness for armed conflict, as well as the potential loss of defense-related suppliers that could affect the ability to sustain armed conflict. These and other insights were gleaned from plant-level interviews and tours of several, small defense-related manufacturers.

THE METAMORPHOSIS OF THE DEFENSE INDUSTRY

Although all manufacturers have been faced with rapidly changing markets due to increased global competition, the restructuring of the competitive environment for the defense-related industry has been significantly more extensive than for the non-defense sector. The downsizing of the defense industry had profound, and varying, effects on individual facilities. Not all were negatively impacted. There were two extremes—while some flourished, others died, or are in the process of dying. The ones in-between appear to be struggling, and their long-range success in the more competitive commercial market remains uncertain. The insights discussed here are derived from plant-level interviews with, and tours of, several defense-related manufacturers.

ON-SITE INTERVIEWS AND PLANT VISITS

This study involved on-site, extensive in-depth interviews and plant tours of seven small defense-related manufacturers (mean: 65 employees; range: 30-103) located in New England. For these firms, defense sales, as a proportion of total sales, decreased from mean of 66% to 40% during the period of restructuring starting about in 1990. This is roughly comparable to the decrease for Raytheon (52% to 32%) and United Technologies (20% to 14%) during approximately the same time period, early to mid 1990s [2].

Each plant visit and semi-structured interview, which included open-ended questions, lasted approximately three to four hours, and sometimes longer. In each case, the interviewee was the manufacturing manager or another person equally knowledgeable about his/her plant's products, processes, strategies, as well as the concerns of their specific industry. Thus, the manufacturing competitive priorities of the firms visited could be ascertained, as verbalized by their managers and as observed by the investigator, leading to various interesting and important insights.

INSIGHTS

Successfully Transitioning Firms

The more successful firms appear to have had strategic, and early, insight into the implications of what the downsizing of the defense industry would mean for their particular industries, and for their particular firm. They are successful, at least in part, because they have proactively exploited the opportunities in their new environment in anticipation of these implications.

One common theme was a conscious decision to hold their defense production constant (in terms of dollars or units) if possible, and then to grow the rest of the business. One might note that because of the growth of commercial production, the defense involvement, as measured by percentage of total sales, could appear to have decreased, yet the actual defense involvement might be holding steady when measured in terms of dollars or units sold.

Another common theme was intentionally to leave the defense industry altogether by developing new commercial products and markets, by transferring their expertise, as well as their existing labor and equipment capabilities to the new requirements. Moreover, as some manufacturers sought to become more competitive in the commercial realm, they also would implement process improvement initiatives, often adding additional manufacturing capabilities in

the process. This would further enhance their expansion into the commercial realm via new product introduction. This also benefited any remaining defense production by making it feasible to produce for the government more economically.

Others firms proactively sought opportunity wherever it might be, a policy which can sometimes take an unforeseen twist. In at least one case, this approach ended up increasing defense sales.

These relatively successful firms have also had to contend with gaining skill in areas which were not needed as much earlier when they were functioning primarily as defense manufacturers--marketing skills is one such example.

Moreover, for firms which remain defense oriented, or which still do a significant amount of defense work, there are fewer, but stronger, competitors. Some of these were strengthened through consolidation with others. Others have been strengthened because of the attrition of their competitors. Those remaining appear to occupy relatively protected niches due to various barriers-to-entry associated with defense contracts. The barriers are many, including massive paperwork and bureaucracy, inspections, the requirement to separate defense-related inventory from commercial production inventory, certifications, as well as having to "qualify" specific equipment and workers for certain types of production, sometimes unrealistically and unnecessarily tight tolerances, as were emphasized by various defense-related plant managers. Once a manufacturing firm ventures away from defense work, these and other barriers effectively prevent most from re-entering. This allows for those remaining in defense work to increase their prices, resulting in greater profitability for the survivors. As one manager said:

. . . a decision was made that was that we were not going to take anything (incoming orders), just to take it. . . . was taking a calculated risk. The calculation was that there was

no one else that really could do it. They can't qualify anyone else because they have gotten rid of all of their qualified people. . . . So we doubled, tripled and quadrupled prices and they screamed. But now I am making a little money on them . . . So that was another very, very, definite decision that was made.

Market Segmentation: Implications for Manufacturing Competitive Priorities

Additionally, as seen from some managers' perspectives, defense firms-- including those that are in the midst of leaving the defense industry-- tend to view their market as being comprised of several smaller ones, sometimes with different competitive requirements. For instance, producing directly for the government is viewed as one market, whereas producing for another defense contractor is viewed as another market, each with its own competitive requirements. Similarly, producing for "A" customers (i.e., the largest or most profitable customers) is different from producing for "B" and "C" customers (least profitable) again with the emphasis on different competitive priorities for each segmentation.

Moreover, the manufacturers that primarily have left the defense industry, or are in the process of leaving, are now facing a different set of competitors, and are thus having to reprioritize their competitive priorities accordingly. Furthermore, in addition to the increased segmentation of the markets, the prioritization of the manufacturing competitive priorities of these specific firms which participated in the this study has essentially reversed in some cases, or otherwise changed, over the last several years for each market segment, due to the demilitarization.

Serving multiple segments, each with its own demands as aforementioned, a production facility is thus faced with the competitive demands of one segment frequently conflicting with those ascribed to another segment. For instance, one market segment may demand quick and on-time

delivery above other considerations, such as low cost. It may not care if the resulting market price is higher than otherwise would be the case. Yet, the same production facility may also serve another market segment that demands low cost production, with quick delivery not essential. The manufactured good is frequently made-to-order, designed and manufactured for a specific customer, and therefore can not be kept in inventory for future purchases. The same provider of the manufactured good thus tries to meet the demands of each market segment, with varying degrees of success.

Managerial Perceptions Concerning Basis of Competition

While some managers might perceive their respective facility to be either competing or not competing on the basis of certain competitive priorities (such as quality, cost, delivery, etc.), upon closer questioning and/or observation, this perception frequently is not borne out. For example, when one manager was asked whether his facility had undertaken any cost reduction programs in the last five years, he said his facility had not (because cost is not that significant to their buyers). He also indicated that they were not planning any cost reduction programs in the future either. Yet, when more specifically queried, it was apparent his facility had indeed implemented various cost reduction initiatives, such as automation, materials handling improvements, throughput time reduction, etc. When that was pointed that out to him, he replied:

Yes, (that is) fascinating actually . . . it is funny as you put it in these terms and put it in this box, and I think no, there has been none of that, but yet we have been doing this all along.

That is true. I guess that is why we are making money, right?

Of additional note, although every firm contends that quality is essential to remain in the marketplace, several of the firms interviewed do not have well-defined quality assurance

procedures. For example, one defense plant manager said that quality was important to their competitive position and that, "I take pride in the fact that defense-wise, our quality is right up there. One of the best, and they have told us that." Yet, when the same manager was asked how quality was defined in his facility, he replied, "Maybe we should come back to that one. I'll have to think about it." When asked about different aspects of quality management, such as whether or not his facility used Statistical Process Control (SPC) or Pareto analysis, he replied:

Not at the present time . . . We have no call for it right now. We have no military contracts that have SPC. We have in the past had military contracts with SPC. My QAR that was assigned to me at that time didn't understand the concept, didn't know how to implement it. . . . referred me to somebody in Boston who couldn't tell me how to implement it. . . . and my SPC contracts were cancelled. I have looked into programs. I do have an SPC program. XXX from XXX gave me the XXX SPC program, but I haven't got it up and running because I don't have the call for it.

(Lack of) Governmental Assistance During Transition Phase

Another interesting observation is that many of these firms, including both successful and more marginal ones, seem to take pride in their independence and "going it alone." Their managers indicate that their firms have not received any guidance from the government during the demilitarization transitional period. Moreover, they do not feel that any such guidance would be beneficial to them, although some felt that there were certain, very specific areas in which the government could be helpful. But these areas tended to be industry dependent and had little to do with the downsizing of the defense industry. One manager whose firm made the transition successfully--yet still prefers to do government work instead of commercial because of the greater

certainty and stability of orders--described different focus groups he had participated in as follows:

. . . it is amazing, this usually ends up half and half. You'll have half the table that the people are very successful, and the other half of the table, that they are wandering along. The guys on this side of the table are successful, haven't waited for anybody to help them. They have gone out and they have done something for themselves about their own problems. The guys on the other side of the table say, 'when is the government going to do something about this, when is this state going to give us some help' . . . It is totally amazing, but that is what we did here. I don't know why, but I just felt as though we had to make this conversion, so I felt as though the handwriting was on the wall. So we started looking for commercial accounts .

Another manager, whose firm also is well on the way to transitioning, said:

We were not given guidance from the government, but saw it coming and started searching for more commercial work before the defense contracts stopped coming.

The above managerial insights also support the contention that those firms which are successfully navigating the transition have proactively acted upon early insight, i.e., their approaches are not "knee jerk" reactions.

Concern over U.S. Preparedness for Military Conflict

Additionally, several managers expressed concern that the U.S. would not be able to fight a war if called upon because the military would no longer have enough suppliers readily available. This is compounded by the policy the military has more recently adopted: that of not keeping any excess inventory. Some managers said that the military used to order 1000 "widgets" and then put 500 of these into inventory. Now the military only orders the number they actually need at the time, i.e.,

there are no reserves, or if there is an existing reserve, it is often inadequate in other ways. The effect of this inventory policy was seen during the enforcement of the United Nations-mandated 'no-fly' zone in southern Iraq when the lack of spare parts was making it necessary to cannibalize one jet to repair another [1]. As one of the defense manufacturers suggested:

The military used to buy things six months in advance and then stock them for six months. They don't do that anymore. They buy it now and put it in the airplane tomorrow. And I think that is not really the way that this government should go, because if there is war tomorrow, we can't do it. And that is the difference between Desert Storm and now. We were prepared, we had the stock, we had the parts. We don't have it now. We could not fight a war right now.

Similarly, another defense plant manager observed:

If there is ever a war, we are in deep trouble . . . I think it would have to be by edict (that manufacturers supply defense materials and/or equipment), and the government would have to spend a lot of money on equipment because of what they have in storage-- what the government has in machine tools are all antiques. I think our next war is going to be . . .

Others have expressed concern about U.S. preparedness for war as well. For instance, Lauren Thompson, director of defense programs at the Alexis de Tocqueville Institute (Washington, DC), contends that "When you eliminate excess military productive capacity, the day may come when it is not available for rapid mobilization in wartime" [2].

IN SUMMARY

In essence, the defense-related industry and market has experienced great turmoil, as seen by manufacturers which remained immersed in defense work, as well as those that exited the industry,

and now those that are now trying once again to reenter the defense industry. These changes, resulting from the changeover from a defense economy to a peace-time economy, and now back again, place tremendous strain on their respective production facilities. Some firms have done well during the transitional phase, while others perished, or are in danger of doing so. But, the commonality is that all of the defense firms have been affected in one way or another. Each one has been faced with new demands, and how they deal with these demands will determine their long-term viability. The more successful manufacturers are successful, at least in part, because they have proactively exploited the opportunities in their new environment.

For the U.S., the implications of downsizing the defense industry may also have profound effects. Some of these are already becoming apparent -- such as the impaired ability to undertake and sustain a military action.

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