

Today's Big 5 aerospace firms incorporate what, not so long ago, were 51 separate companies.

The Distillation of the Defense Industry

By John A. Tirpak, Senior Editor



FOR a decade, the defense industry has been shrinking with dizzying speed as Pentagon budgets plummet and contractors either merge or team up to compete for the few remaining US procurement programs. Civilian employment in the defense industry has tumbled by more than 2 million workers—at one point dropping at the rate of 1,000 jobs a day. Long-respected names in the business have either disappeared or become mere divisions in a new family of mega-giant contractors.

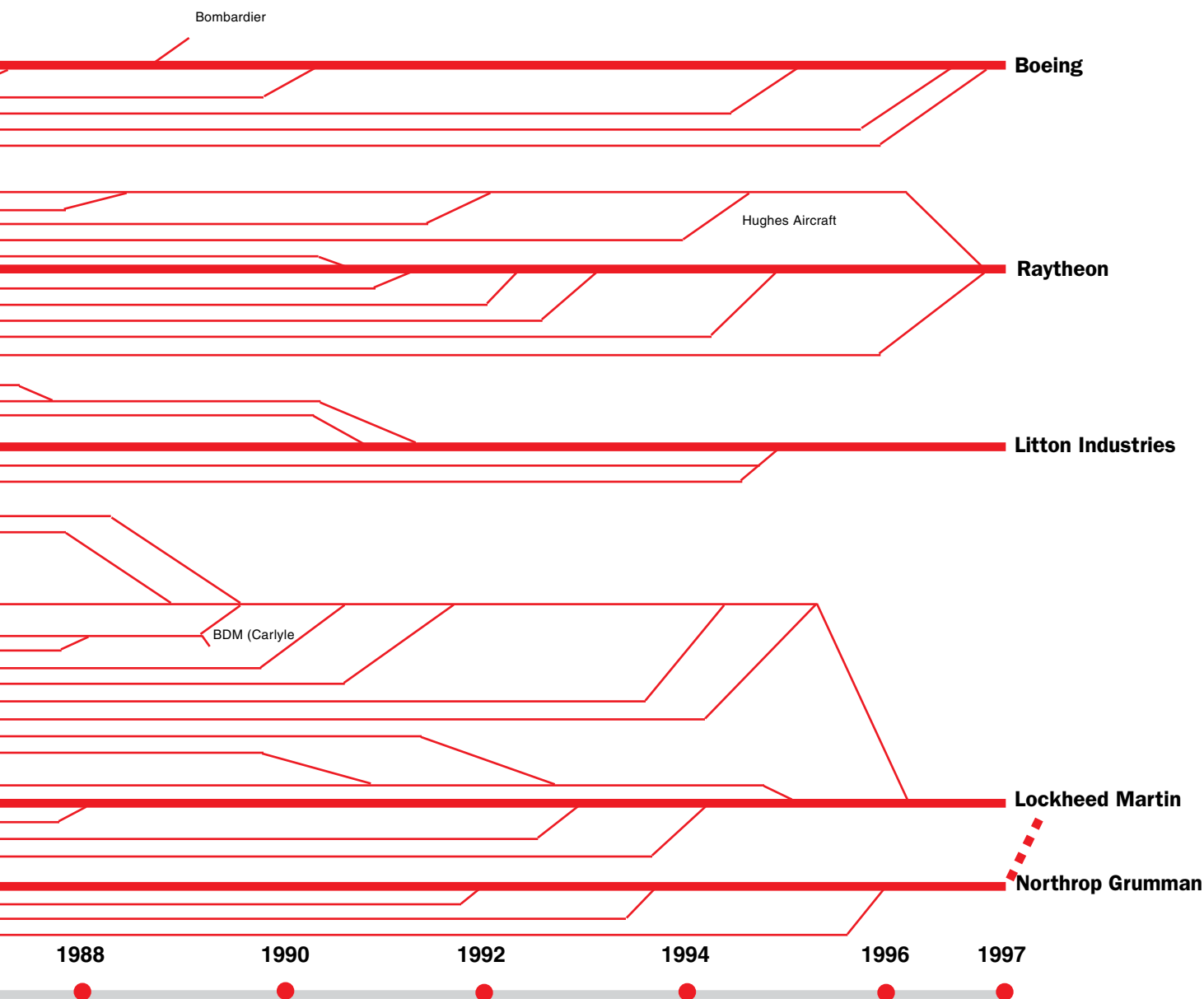
The changes have given rise to concerns in some quarters that the shrunken defense industry won't be able to rise to the challenge of another great military conflict and that the

industrial base can't be sustained, let alone reconstituted.

However, industry and Pentagon leaders contend that the tectonic shifts in the defense business are neither avoidable nor disastrous. They see the contraction as a realistic and necessary response to a changing world and that the shifts ultimately will save money and broaden the base of technology upon which the US military can draw for future weaponry. These leaders conclude the era of years-long wars of attrition are over and that there is no need to maintain an extensive, costly capability to "surge" the production of large platforms such as fighters and warships.

They believe that the consolidation will offer American companies a competitive edge over foreign rivals in the contest to supply allies with military and civil aerospace hardware.

However, even those leaders who trumpet the benefits of consolidation include an important caveat. They maintain that, if this "new and improved" military-industrial complex is to work, DoD and its suppliers will have to shift their thinking on how to do business. Specifically, they warn, the Defense Department must continuously come up with innovative ways to preserve competition when there are only two companies—or just one—making vital products.




“The Last Supper”

One of the red-letter events in the recent wave of consolidation is known to industry insiders as “the Last Supper.” The coinage refers to a 1993 Pentagon dinner for the chiefs of the nation’s biggest defense contractors, hosted by then-Secretary of Defense Les Aspin and his deputy, William J. Perry (who later succeeded Aspin in the top job). Along with the meal, Aspin and Perry served a blunt notice—the

in-house Pentagon study in 1993 determined that the nation needed only two fighter aircraft makers, not five as was then the case. Likewise, DoD concluded it needed only one bomber builder, as opposed to three. It came to similar conclusions regarding tanks, submarines, missiles, satellites, and the like.

Perry, upon taking over as Defense Secretary in early 1994, further emphasized consolidation “in both private and public sector,” Gansler said.

four of DoD’s five largest aerospace and electronics suppliers, and they illustrate the magnitude of the contraction the defense industry has just gone through. Today’s big five in aerospace—Lockheed Martin, Boeing, Northrop Grumman, Raytheon, and Litton, ranked one, two, three, five, and nine in defense contracting last year—consist of what were, just 14 years ago, 51 separate companies, nearly all of which counted as prime contractor or



The surge capability needed for aircraft, ships, and tanks during World War II, as in this B-17 plant, will not be needed in the 21st century.

level of defense spending, which was already on a five-year slide, was going to fall much farther, and fast. Most of the guests were savvy to the situation; defense buyouts, mergers, and sell-offs had been proceeding apace since 1986. However, Aspin and Perry urged their dinner guests to take consolidation much further and much faster.

At the same time, DoD’s two top officials insisted the Pentagon would not play a role in designating which companies should stay in business and survive. Instead, they said, they would allow the market itself to rationalize the industry.

Later, Perry flatly stated, “We expect defense companies to go out of business. We will stand by and watch it happen.”

At the time of the Last Supper, the defense industry was burdened with “enormous excess capacity,” according to Jacques S. Gansler, the current undersecretary of defense for acquisition and technology. “The budget was plummeting, particularly [the] procurement account,” he said. Gansler noted that an

The guiding principles, according to Gansler, were “that they wanted to encourage consolidation in order to gain efficiencies, but they wanted to maintain competition in all critical sectors.” These guidelines “are basically the same that Secretary [William S.] Cohen is using ... now,” Gansler said.

Former Lockheed Martin chief Norman R. Augustine, in a 1996 speech to a joint session of the Association of the US Army and the American Institute of Aeronautics and Astronautics, boiled down the situation in blunt fashion. “It is much better to have 10 strong competitors than two,” he said. “Unfortunately, that choice is basically irrelevant, since it is not among the options we have been given. The choice we have been given is more precisely characterized as one between having 10 weak competitors with dubious futures or two strong ones with hopeful futures.”

When 51 Equals Five

Today, some of those defense contractors with “hopeful futures” are

major subcontractor heavyweights in their own right.

With size comes clout. Last year, Lockheed Martin alone was paid 10 percent of all defense procurement dollars. The top five contractors accounted for more than 25 percent of the total. That was roughly the same amount that DoD expended on the next 95 defense contractors combined.

Now, Lockheed Martin and Northrop Grumman wish to merge into a single firm. If the deal is consummated, the number of “megas,” as some in the industry call the big four contractors, will shrink to just three, and the new company would receive 28 percent of the combined Pentagon procurement and research and development budgets.

The Justice Department and Defense Department moved to thwart the Lockheed Martin and Northrop Grumman merger, however. They do not necessarily think the new company would be too big; rather, they are concerned that the combination would create a virtual monopoly in some areas—most nota-

bly, in the field of electronic warfare. The lack of competition, the government said, would cause innovation in this vital area to languish and would endanger "our soldiers' lives and our taxpayers' wallets," in the words of Attorney General Janet Reno.

The government has asked Lockheed Martin to sell off some of its electronic businesses in order to preserve competition in these areas. The company has declined, wants to pursue the merger as now structured, and the issue is scheduled to be settled in court later this year.

The problem underlying the Lockheed Martin and Northrop Grumman merger, according to the government, is one of "vertical integration." When a company has in-house capabilities down to the second- and third-tier supplier levels, it can not only bid on new platforms as the prime contractor but as a "package deal," essentially selecting itself to provide subsystems. The problem with this is that other second- and third-tier suppliers might never get a chance to bid on the subsystem work dominated by the prime, and the in-house division, facing no competitor, has little incentive to innovate or keep costs low. As time goes on, the critics claim, competitors disappear from lack of work, and innovation is further stifled.

The federal government argues that this proposed merger would "reduce competition in the sale of advanced tactical and strategic aircraft, airborne early warning radar systems, sonar systems, and several types of countermeasures." Lockheed Martin is the prime contractor for the Air Force's

F-16, F-22, and F-117 fighters, while Northrop Grumman is the prime contractor of the Air Force's Joint Surveillance Target Attack Radar System and B-2 stealth bomber.

No to Monopoly

"At some point, the logical extension of consolidation is monopoly," Gansler said. "When you get down to the point where consolidation from two to one eliminates total competition, then it's obvious you blow a whistle and you stop."

Gansler emphasized that the government's move on the Lockheed Martin deal doesn't signal a shift in policy and that consolidation probably should continue.

"We're ... trying to let the market operate and not try to say to firms what they should and shouldn't do," he asserted. "We simply want to get down to the point with market forces operating whereby we still have competition left, but we have greater efficiency. ... We're going to look at each case separately."

Ironically, the federal government was warned about the vertical integration problem two years ago and by none other than Augustine himself. In a 1996 speech, Augustine pointed out that vertical integration threatened to provide mega-companies "the opportunity, if they wish to pursue such a course, to ... shut out as sellers those traditional second- and third-tier component suppliers who, operating at the lower end of the manufacturing 'food chain,' normally sell to the 'primes.'"

Augustine warned then that there were "disturbing signs that some in the aerospace community have elected

to follow" the shut-out route, which he said would prompt competitors to follow suit in self-defense. "This is a trend," he said, "about which our government, as both a large purchaser of aerospace products as well as the guarantor of free-market practices, should be evidencing a great deal more concern than it has indicated thus far."

Northrop Grumman CEO Kent Kresa, addressing the AIAA in Washington in May, said industry will avoid shut-out practices "not ... out of the goodness of our hearts" but because "it's good business." Any major contractor who "freezes out competitors by denying them access to components" or "shuts out those traditional vendors selling second- and third-tier components up the value-added process," Kresa observed, "will cut its own throat in the long run. It will stifle its access to innovation and give huge advantages to its competitors."

Augustine, in his speech, also made a key point about the efficiencies to be realized from consolidation. The merger that created Lockheed Martin, he said, eliminated 14 million square feet of unneeded factory space and cumulatively produced savings of \$1.8 billion a year, most of which would be passed on to the government in the form of lower overhead costs and lower bids on new systems. Such savings, he noted, were equivalent to what the government says it will eventually save "as a result of the rather monumental effort of the Base Closure and Realignment Commission—or BRAC."

Kresa asserted that adding his company to Lockheed Martin would produce additional savings each year of some

Vertical Integration in Aircraft Sector: Current Capabilities

Sector	Lockheed Martin	Northrop Grumman	Boeing	Raytheon	Litton	ITT	Tracor	Notes: The Xs denote demonstrated capability at the system level.
Platforms	X	X	X					
Systems Integration	X	X	X	X ¹				¹ Raytheon E-Systems has done integration work on airborne intelligence platforms.
Radar								² Raytheon produces towed decoys and off-board countermeasures, not internal systems.
Airborne Early Warning	X	X						
Airborne Fire Control		X		X				
Surveillance	X	X		X				³ Litton provides Electronic Support Measures, not entire RFCM systems.
Imaging	X	X		X				
Electronic Warfare								⁴ Tracor supplies threat warning receivers and transmitters, not entire RFCM systems.
RFCM	X	X		X ²	X ³	X	X ⁴	
IRCM	X	X						
EOMWS	X	X						

Source: DoD

\$1 billion, “a majority of which will accrue to our government customers.”

The General Accounting Office, a congressional watchdog agency, said in an April report that there is “little evidence” that the Pentagon has been harmed by industrial consolidation so far. The Defense Department, it said, encouraged consolidation to “eliminate excess capacity to remain competitive and financially viable,” adding that DoD expects “significant cost savings” from the shakeout.

Putting it more simply, Augustine noted that “two full factories” running at full capacity are more efficient “than four half-full” ones.

The New Industrial Way

Part of the solution to maintaining a healthy defense industrial base, according to Gansler, is to limit, as much as possible, the strictly “defense” aspect of it. By using more off-the-shelf commercial technology, and by using new computer-run, adaptive production methods, the base of technology—and suppliers—upon which the Pentagon can draw would be broadened so that “we only have one industrial base.”

As an example, Gansler noted that certain electronic cards used in the F-22 fighter and Comanche attack helicopter are made on the same assembly line as those made for use in automobiles.

“The computer knows” when the next item on the line is defense-specific and builds it accordingly, Gansler pointed out. Using such a process, an item that might have been very expensive due to the need to set up tooling and facilities for a low-volume run suddenly becomes relatively cheap because it is made alongside high-volume items.

“So you get the overhead absorption, you saved at least 50 percent on the cost of the defense goods, and you have a greatly expanded industrial base,” Gansler explained. While such an approach does not apply to items such as aircraft stealth technologies or submarine quieting technologies—which have no commercial market—using such practices as much as possible and adapting them to defense-specific products can produce enormous savings, Gansler said.

Using this commercial-goods and commercial-practices approach will help cut down the Pentagon’s onerous

cycle time of 10 to 20 years for introducing new technology, Gansler noted. The computer industry, for example, doubles the power of its products every 18 months, and the Pentagon should emulate its success by pursuing “something that’s more like [a] spiral development process ... where you have a continuing evolution of requirements and products that come along every few years,” staying abreast of technological developments.

He added, “Assuming we’re successful” in acquisition reform and in moving toward more commercial products, “we’ll have a far broader industrial base.”

Forget About a Surge

Part of the savings to be achieved in the defense industry lay in abandoning the practice of maintaining manufacturing lines or tooling for the sake of being able to “surge” their production in wartime, Gansler observed. In the 21st century, he said, “it’s not likely that, in emergency conditions, you’re going to start building airplanes or ships or tanks or things like that” since such systems would probably take far longer to build than the conflict would last. “You don’t need the same standby capability that we had envisioned for World War III, where you have huge amounts of equipment coming back for repair and maintenance and huge production increases,” such as in World War II.

In Gansler’s view, the US would be likely to surge the “expendables, [meaning] munitions, spare parts, things of that sort. ... So, you need some standby capability for those,” he said, but to the greatest extent, that should be accomplished “through an integrated civil–military” production line, so the Pentagon doesn’t have to pay “for ... excess capacity sitting around waiting for a surge requirement.”

An integrated commercial–military line also provides for surge by simply shifting the emphasis of production, he noted.

Gansler acknowledged, however, that in some areas—such as submarine construction—“it may be just for the purposes of maintaining an industrial base that you’re willing to accept the inefficiencies and the subsidies required to do it. So there are going to be cases where that occurs.”

The Pentagon has managed to keep competition alive as the industry consolidates but will have to increasingly turn to nontraditional means of doing so, according to Eleanor Spector, director of defense procurement.

“We still have two sources in every sector that we need to compete,” Spector asserted, adding that consolidation has been “very healthy” for the Defense Department. “We have a strong, healthy defense industry in the face of a 60 percent drop in the budget,” she noted. As the supplier base narrows, though, there are things that can be done to maintain competition even if there is only one supplier left for a given item.

“We can provide things as government-furnished [equipment],” she said. “If teams form that don’t allow for competition in some cases, we can break up exclusive teaming. If teams form that create [a] sole source, we can have international competition. We can create firewalls within companies if we have to. We can do dissimilar competition, as you saw with the non-developmental aircraft vs. the C-17.”

There is “a whole menu of things ... that we can do to create competition,” said Spector, “and we will.”

Gansler observed that, if there is a sole-source situation, “you can always start up an R&D effort for the next-generation system to create an alternative, rather than depend on one supplier.” All these techniques “exercise the buying power of the government,” he said.

The prospect of dissimilar competition has been used as a lever in the Navy F/A-18 and Air Force F-22 fighter programs, Gansler noted, and DoD has held out variants of the forthcoming Joint Strike Fighter as competition. Similarly, “competing missiles vs. airplanes” is an example of using different approaches to the mission itself as the competitive prod.

Foreigners Can Play

Moreover, because the US will probably conduct most of its future wars as part of a coalition, Gansler said, finding a foreign supplier/competitor on some systems is acceptable, since it is in the alliance’s advantage to have interoperability.

Gansler said the Pentagon’s policy on foreign ownership of US defense firms

is to treat such proposals on a case-by-case basis. If a foreign company were to take an equity stake in a US contractor doing sensitive work, "they would have to set it up as a separate operating unit. They'd still have the equity, but [they] wouldn't get the technology transfer."


Noting the competing interests of foreign and US companies, Gansler said, "You run into the [fact that] they're your ally in a military sense and then your competitor in an economic sense, and where that line is drawn becomes

ensure the survival of the companies involved. Since then, the "megs" got bigger in order to acquire more market share and improve their bottom line. He warns that, in the next two or three years, the industry will see "some very big losers"—companies that failed to recognize the need to consolidate and missed the chance to get together with suitable partners. Such companies, said Bovin, will be "left behind."

The companies that moved to consolidate in the early 1990s—when defense

"and left it to the marketplace to work it all out." There is a "misconception in Europe," he added, "that DoD engineered it all."

Charles Masefield of the UK Ministry of Defense, also addressing the AIAA, said that the leaders of several European countries recently issued their own "Last Supper" message to European contractors to start consolidating or be hopelessly outclassed by the new large American companies. He predicted that the mergers will come but not in the



Defense experts feel that even the eventual replacement of current systems, like these F-16s, will come at a much slower pace than in the past.

Photo by Jim Haseltine

more and more difficult" to determine. Still, he warned against "the trend toward 'Fortress Europe' and 'Fortress America,'" in which protectionism prevents the alliance from benefitting from its members' technologies. Such a stance "is inconsistent with the concept of coalition warfare." Gansler wants to see more "trans-Atlantic linkages," but he prefers to let industry work out the structure of such cooperation for itself.

The mega-mergers in the US defense industry are probably drawing to a close, according to Denis A. Bovin, vice chairman of investment banking and senior managing director at Bear Stearns & Co., an investment banking firm that has participated in many of the deals that created the supercontractors.

"We're probably looking at the end of what I would call the 'leadership mergers,'" Bovin said at a recent AIAA conference, "but we'll pick up speed in [mergers among] the secondary tiers."

Left Behind

Bovin said that the fast pace of mega-mergers took place at first to

stocks were low priced—"got the best deals and the best partners," Bovin said. Companies only now looking to merge will find it harder because defense stocks have risen in price, making acquisitions more expensive.

European defense companies, which face numerous obstacles to consolidation, will have to overcome them if they are to compete with the big US firms, Bovin observed.

By themselves, Boeing, Lockheed Martin, and Raytheon are "twice as big" as the major European defense companies combined, he said, and will be able to offer more technology at a lower cost because of the efficiencies they have realized through consolidation.

"European defense companies may be unable to compete in a few years time," Bovin asserted.

From the perspective of exports, savings in defense overhead, and cheaper new technologies, consolidation has been "a wonderful development for the US taxpayer," Bovin said. He also observed that the Pentagon "devised a vision" for the defense industrial base

same rapid way that they took place in the US. There will be "evolutionary progress" in rationalizing the European defense industry, he said.

The likelihood that the US will need to reconstitute a defense industrial base on the scale that it supported during the Cold War is considered remote, at least for the foreseeable future. Kresa of Northrop Grumman said that his company expects defense budgets to remain "essentially flat" well into the next century.

Kresa said that large numbers of defense platforms bought during the Reagan Administration will be getting old and will come due for replacement in the next few years and that this "may keep things from getting worse" in the defense industry.

Some in the Pentagon and Congress feel the world is safe enough to warrant skipping a generation of systems. Whenever the replacement actually occurs, Kresa said, "the pace will be much slower, and the industry will not come back to its earlier size." ■