



Rear Admiral Joe Carnevale

To begin, let me make a couple of observations, one at the microscopic level and one at the macroscopic level. I bought a new computer on Friday, and I have spent the whole weekend trying to get all the software up on it and transferring data from the old computer. I had it custom built at a local shop; I told them I wanted a fast central processing unit (CPU), Windows 7, a 64-bit

Rear Admiral Joe Carnevale represents Shipbuilders Council of America before Congress, the U.S. Navy, the U.S. Coast Guard, and other federal agencies, applying over 30 years of experience to defense acquisition issues. He actively participates in a variety of ship maintenance and construction issues including the surface ship maintenance budget, the shipbuilding budget, multi-ship/multi-option contracting, the Naval Technical Committee, Naval Vessel Rules, ship-building issues specific to ship classes, and many other important issues affecting the ship building and repair industrial base. Prior to joining Shipbuilders Council of America in June 2005, Rear Admiral Carnevale led the professional services division of one of the fastest-growing Fortune 500 companies. He served as Director of Fleet Maintenance for the Commander, Fleet Forces Command where he addressed the complete range of fleet maintenance issues as well as the recovery operation for USS Cole (DDG 67). As Program Executive Officer (DD 21) for the Assistant Secretary of the Navy (Research, Development, and Acquisition), he led the development of the next-generation U.S. Navy surface combatant. He has directly participated in the construction of six different ship classes. After graduating from the University of Massachusetts with a B.S. in chemical engineering in 1971, Rear Admiral Carnevale joined the Navy, participating in combat operations in Vietnam. He attended the Massachusetts Institute of Technology where he earned two postgraduate degrees (an M.S. in naval architecture and marine engineering and an ocean engineer's degree in 1980). He was promoted to the rank of Rear Admiral (lower half) in 1998.

operating system with 16 megabits of random-access memory, a 1-terabyte drive, a high-end video card with multiple CPUs, and a cabinet with a lot of fans. I ended up with seven fans: five in the cabinet, one on my video card, and a big fan on my CPU. Of course, you know what fans mean? Fans mean heat. You have to get rid of all the heat that your computer is generating, and of course, heat is proportional to the power that you are using. So, I had to have a high-end power supply. Five years ago, my computer had a 500-watt power supply; the one I bought on Friday has a 700-watt power supply, a 40% increase. So, at the microscopic level, it is all about energy. It adds up—every little bit of it.

Now, let us take a more macroscopic view. Several years ago, I read an article in *Technology Review* that observed that when India's standard of living reaches the current level of Belgium, world demand for energy will have doubled. So add up all those little CPUs and fans all over the United States and all over the world—because people are constantly upgrading and getting more and more and more power—and it is all about energy.

I am the one and only industry speaker you are going to hear on this panel. The bad news is I am not a fuels guy; I am a shipyard guy, so bear with me. The good news is that my briefing slides are not going to test your reading skills. The Shipbuilder's Council of America represents about 43 companies with over 100 shipyards around the United States—East Coast, West Coast, Gulf Coast, Hawaii, Alaska, and inland waterways. Those yards deal in commercial work as well as in government work for the Navy, the Coast Guard, the Army, and the National Oceanic and Atmospheric Administration and in some other activities. We also deal in new construction and in repair, maintenance, and modernization. We have companies that deal in all of these areas. We have other companies that deal in only one.

So what does industry want out of all of this? To be blunt, industry wants profitable contracts, and I must be the industry guy because I just mentioned the P word. Industry also wants the opportunity to perform. That is critical because that establishes industry's relationship and credibility with its customer; industry lives on having a good customer base. In order to perform, industry

would like stability; they would like to get on a learning curve. In acquisition, the best way to get cost down is pretty simple. The best way to control costs is to fix your requirements before you start the design, complete your design before you start production, and then start construction and get into series production so you can get on the learning curve and get down the learning curve.

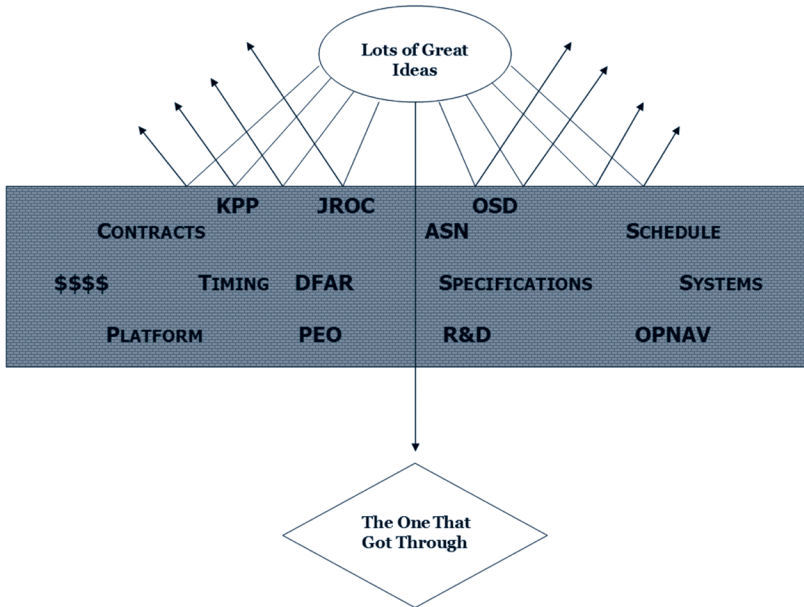
I am going to talk about two parts of the industry—the shipyards, which is the part I deal with most, and then the whole host of vendors and research and development (R&D) organizations—the brainy people who have all kinds of good ideas. While I am going to put everything in the context of shipyards and shipbuilding, what I present should be applicable to aviation, ground vehicles, and even major software procurements.

The absolute first thing we need to do is to set the requirement. If you do not do that, your program is in big trouble if not dead on arrival. The encouraging thing with regard to the requirements associated with the Navy's use of energy is that we have Rear Admiral Philip Cullom, the Director of Energy and Environmental Readiness Division, and an organization that is focused and dedicated to addressing the appropriate issues. So that is good news.

Fortunately, too, industry is making a lot of contributions. Industry is coming up with ideas on how to improve hull forms and appendages on the hull, how to improve both main and auxiliary propulsion, and the use of green fuels. Industry is also looking at ship operating procedures.

While industry has a lot of ideas, some big and some small, the problem is there are lots of barriers (Figure 1). I am sure most of you know about at least some of these barriers. In the case of timing, for example, you think you have got a great idea and a great platform, but the timing is just off. You cannot get your idea into the program, you are too late, you missed the window, there is not enough money, or there is no allocation for that. There are all kinds of organizational wickets you have to go through.

When I used to teach acquisition to young engineering duty officers, I would tell them that it has taken 40 years to make acquisition this hard and it could not have been done in a day less.



KPP, Key Performance Parameter; JROC, Joint Requirements Oversight Council; OSD, Office of the Secretary of Defense; ASN, Assistant Secretary of the Navy; DFAR, Defense Federal Acquisition Regulations; PEO, Program Executive Office; OPNAV, Office of the Chief of Naval Operations.

Figure 1. Lots of Barriers

Joe Carnevale’s third law of bureaucracies is that every time you move the boxes around, you get more boxes. That is what we have been doing for 40 years, so you have all these activities that are there trying to do a good job and trying to make sure that they weigh into the process. As a result, you get a lot of people weighing in, and you need facilitators to move through this obstacle course to take those great ideas and actually get them aboard steel hulls.

Fortunately, what you are going to hear about today are people who are facilitating the process and are being successful at moving their ideas through the process. From my perspective, if you want to lock this process in concrete, you really have to take a systematic approach. You need Key Performance Parameters (KPPs) that pertain to fuel cost, to manning, and to maintainability. While fuel cost is an enormously important part of this, you cannot focus on it exclusively. Manning and maintainability are also key focus areas for the Navy right now.

My thought is that from the very beginning of a program, you need to allocate dollars, both for development and for acquisition, and you have to allocate displacement, center of gravity, and volume. If you want to get improved energy efficiencies, you are going to need to make adjustments within the allowable margins for all of these factors. If you want to improve maintainability, you are also going to need all these things. If you to want to address manning issues or improve the quality of life for our sailors, you are going to need all these things.

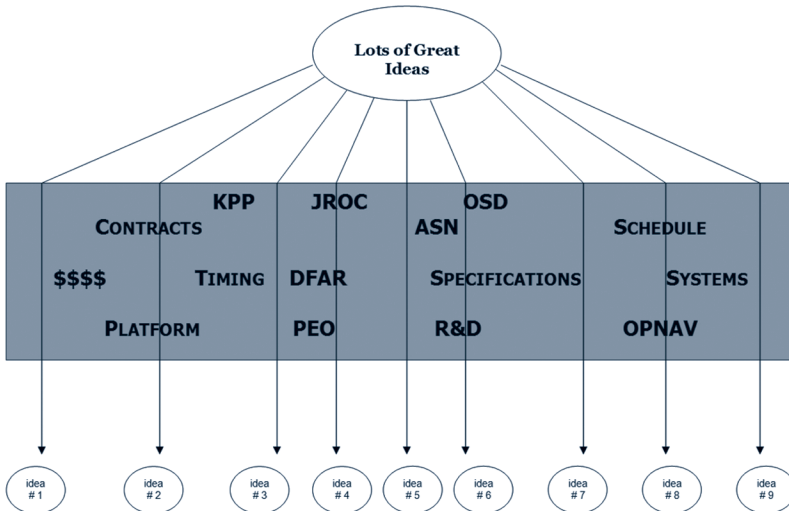
If your requirements say that you have to have a 5-inch gun, then you have to fit it in within allowable margins. During the development process, someone will have to make the necessary allocations: I have to have this much development, this much acquisition, this much volume, displacement, lay down—it will all have to be spelled out, and it will all have to be allocated. But if you want to improve the energy efficiency of your ship, no one will allocate any of those things right now. And if you do not allocate any of these things, then how is the program manager going to approach taking those great ideas and implementing them onboard his ships?

So you start by establishing clear performance parameters, and you have to measure those performance parameters throughout the life of the program. Then, most importantly, you have to grade the Navy and industry program managers in terms of their success in attaining desired performance levels. You have to determine how well they are applying the allocations that they have been given to improving the fuel efficiencies of their platforms, whether that platform is a ship, an aircraft, or an armored vehicle.

You have to ask: How much displacement, how much volume, how much acquisition cost did they invest in improving fuel efficiencies, and how much fuel efficiency did they get? They needed the allocations to take those ideas and get them through the program, and then they needed to be graded against that to see how well they did. And all of those things have to relate back to the KPPs.

In my mind, that is the way to build lanes through the barriers so that everyone understands from the beginning that there are requirements to improve fuel efficiencies, to reduce total ownership

cost by improving fuel efficiency, to make manning more efficient, and to improve maintainability (Figure 2). You have the requirements, you have allocated the resources, and you will be measuring the programs against those improvements and reporting back. Doing those things should provide lanes through this very, very difficult process that we deal with in getting things into the fleet.



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Figure 2. Build a Path Through the Barriers