

**Chief of Naval Operations
Admiral Gary Roughead
Remarks as delivered at the Economist “World in 2011” Festival
In Brief: The future of naval warfare
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...After video. That’s a little bit about who we are and what we do. Thank you very much. The reason I show that is because often times I believe many in the world suffer from what I call “sea blindness.” The oceans, the maritime domain, provide for our existence, provide for our sustenance, provide for our prosperity and yet often times, we don’t take that into account.

So my prediction for 2011 is we will begin the cure for “sea blindness” because the oceans of the world will become increasingly important to all of us.

Before I talk about the future, I’ll talk a little bit about the past and where we have been and the line of work that I’m in. If you go back 50 years, you would see our Navy operating globally, but you would see it being done in a different way. If I were to take a typical ship from that time- the weapons of that ship would reach out about 18 miles. The area of awareness that it would sense is probably 60 miles. The Navy that sails today, the weaponry on an individual ship will take us out about 800 miles. The area that they are aware of and that they can sense is normally in the geographic region of the world whether it’s the Pacific or the Atlantic, indeed, if we tailor it, we can even have global awareness on the individual ships that sail.

The centerpiece to our Navy is the aircraft carrier. In days past, we would talk in terms of the number of airplanes that we would fly against a target. Today, we talk about the number of targets that will be attacked by one airplane. We’ve seen our Navy move in years to nuclear power. One fifth of our Navy is powered by nuclear energy, which as a percentage of all the Navy’s in the world, I would submit makes us the most green Navy around.

We’ve advanced thinking in ballistic missiles and jets and in networks. And so that is the environment in which we work. But if you believe that the oceans of the world provide for communications, for commerce, and for resources, that’s not going to change. That will stay constant. But as I look to the future out to 2036 and beyond, because in fact, today we are building ships whose life is 50 years, so that which we are dealing with goes out at least that far. We are working on a new submarine, the last submarine of that class will come off of its patrol, its last patrol, in 2080, and we are building that ship now. But the world in the future I believe will continue to have the same type of disorder that we are seeing maybe that might expand a little bit. And why will that be the case? I think that it will be produced by the compression of populations into the littoral area – that band around the coasts of the continents that stretch out a few miles and then in perhaps 50-60 miles or so. The megacities will continue to grow; indeed most of the megacities that exist today are in that littoral area, in that coastal band.

I think everyone here would agree that the climate is changing. And what does that mean for sea levels, for temperature changes, and importantly for sources of water? In fact, I would predict in the future there would be water wars, not oil wars. Because we could probably figure out a way to get beyond oil, and fossil fuels as we are doing in the Navy; but we're probably going to be a little bit more pressed to learn how to live on this planet without water and the frictions that will develop as a result of the scarcity and indeed some of the control of the water sources will be a bit problematic.

And I think that is the type of environment we are going to see. The trade routes are going to change closest to us, the trade routes that will change in this hemisphere when the Panama Canal expands, but if you fast forward to about 2035, trade will now start going over the top of the globe into the Arctic because I think at that point probably in about 15-20 years the ice will diminish enough so that you'll have passage there. The first press into the Polar Regions will be for resource and fishing because the fish stocks of the world are going to continue to migrate where there is colder water. And I think that is where you'll see the first press into the Arctic. And there will be competition for resources there and competition for control of trade routes.

But what are we looking at as we move into the future as far as capabilities that we want? I talked about where we have come from, some of the things that we are doing today.

Clearly foremost for us is the advancement of technology and weapons around the world. We are heavily involved in ballistic missile defense. In fact, we used one of our ships in 2008 to shoot down a satellite that was failing and we were concerned about that coming back into the earth and impacting somewhere. We were able to take one of our ships, not designed for weapons in space, and we were able to make a modification to shoot the satellite down.

We are heavily involved in unmanned systems because I think anyone who runs a business knows that the cost of manpower is extraordinarily expensive and particularly in the military where every decision we make we base it on putting people at risk and if I can take someone out of a vehicle whether its an airplane or a submarine, then that means I'm not putting someone at risk. We are moving aggressively into the area of unmanned.

We are moving into electromagnetic launching systems. For example, we are building a new aircraft carrier now that we can take 60 thousand pounds, which is about 10 Hummers if you were able to latch them all together, and in two seconds go from zero to 150 miles an hour which allows us to launch airplanes off of aircraft carriers.

We are working on that same technology with gun technology where we are now able to shoot a projectile 8,000 feet a second with the objective that we could shoot from this site here to Washington D.C. and pick the side of my house that I would want to hit. But that is where technology is going.

The world of cyberspace is going to expand. We've reorganized our Navy in order to be able to address that new domain that is going to open up. We've changed the structure

within our headquarters within the Navy. We have created an organization that has global responsibility for cyber operations. And most importantly, we've taken the people that we have in the Navy and we have organized them into a corps, and when we do that, that's about 45,000 people.

I talked about some of the systems and some of the things that we have, but I have long maintained and I have long believed ever since I've been in the Navy that all of the ships, the submarines and the airplanes have no value to our country until we put people in them. People are our most important resource.

And I'm often asked what has been the most transformational element or thing that has happened since I have been in the Navy and it was the creation of the all-volunteer force. It has given us a quality of people the likes of which we have never seen before.

Last year I was on a mountain in Afghanistan talking to a young officer who was running a Provincial Reconstruction Team, working with village elders with folks building schools, hospitals. He was having the time of his life. Seven months before, he was commanding a nuclear submarine. That's the flexibility, that's the quality of people that we have and that's not going to change.

As we move into the future, I think some of the things that will shape our world is the disorder, the changes geographically, physically that we are going to see. But I also think that countries will become much more sensitive to their sovereignty; the idea of a presence ashore is going to be problematic. Countries will be reluctant to introduce people ashore and for that reason, I believe, that navies of the world, whether operating independently or cooperatively, will provide countries with an off-shore option to look out for their interests and to be able to use the maritime domain for the purposes that we all benefit from: commerce, communications and resources.

So with that, I'd like to take your questions.