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Pierce, Terry C.

Monterey, California. Naval Postgraduate School

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## Rethinking Innovation: Disruptive Technology and Strategic Response

### *Strategic Insights*, Volume IV, Issue 4 (April 2005)

with [CAPT Terry C. Pierce](#)

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### Introduction

NPS professor and military theorist Navy CAPT Terry C. Pierce recently discussed disruptive technology and the Global War on Terror with *Government Computer News*, a magazine on public sector information technology.[1] Pierce teaches classes at the Naval Postgraduate School and recently authored [Warfighting and Disruptive Technologies: Disguising Innovation](#).[2]

#### **Q: What do you define as a disruptive innovation?**

A: For the military, it's a major change in the way we conduct warfighting. Classic examples would be the German blitzkrieg or the Marines' amphibious warfare. Disruptive innovators take existing or new technologies and link them in a novel way or architecture or doctrine. In World War II, the British used their tanks and aircraft and mobile troop transports in a certain way. The Germans got some of those technologies much later than the British but linked them in a nonlinear way and came up with the blitzkrieg.

#### **Q: What are the disruptive technologies in the war on terror?**

A: One example is 9/11. The terrorists took existing technology that we invented—airliners—and turned them into bombs. Terrorists are using other technologies we invented—the Internet, mobile phones, instant messaging—that have a global reach. But they are using them in much different ways than we anticipated. It's classic disruptive innovation.

#### **Q: How can we stop them?**

A: Typically in warfare, an outmatched enemy usually retreats to an asymmetric level. The U.S. way of fighting has been force-on-force or state-on-state combat, which we're very good at. The terrorists can't compete with us at that level, so they go to a different level. They become embedded within the population, so we can't really attack them. We have to go to a different method—separation tactics, such as Special Forces or sniper weapons—something that can separate them from the civilians.

With the Internet and mobile phones and instant messaging, our enemies have moved up to yet another asymmetric level, which you could call a virtual level of warfare. The force itself is virtual. We can't see it until it decloaks itself to send a message or to attack somebody. The area where we should be focusing now is developing what you might call precipitating technologies to bring the terrorists out where we can attack them.

**Q: Who's inventing these precipitating technologies?**

A: In December, when I was at the Office of Naval Research, that was the challenge on the table. We're thinking about it and moving in that direction. It doesn't necessarily mean developing hardware. It could mean software or social-science constructs—studying how terrorists form worldwide networks.

**Q: Is the Homeland Security Department taking part in this effort?**

A: Yes, we're talking with them, and they're looking at the same things.

**Q: What innovations are you working on right now?**

A: Integrating precision technology with network-centric warfare and instant knowledge of the battlefield. At that level, the American way of warfare is doing a good job. But we're developing new constructs such as expeditionary strike groups [ESGs], led by a big-deck amphibious carrier along with Aegis-type ships and submarines, some under the command of Marine generals. That's a very disruptive way of operating by linking existing technologies in a new way.

We're specifically targeting the embedded terrorists with the ESGs. There are Marines who have special skills to operate within the civilian communities where the terrorists are located. This way of operating has a very different measure of effectiveness from a typical carrier strike group or from a state-on-state war against a nation such as North Korea.

**Q: Is this part of the Pentagon's force transformation effort?**

A: It's absolutely a big part. A lot of the guidance is coming out of the Office of Force Transformation and being supported by the Joint Forces Command. For the first time [in joint exercises] around 2003, a Marine Corps brigadier general commanded a big-deck carrier and supporting Aegis ships, destroyers and cruisers and all the associated forces. He ran it in a novel way, very different from the Navy way, because of his knowledge of how to operate ashore.

I was there as his operations officer. You could just see the disruptive innovations in gunfire support and maneuvering ashore. We were using a tactical component network and Iridium satellites to put together the command and control. We were able to watch the Marines and Special Forces going ashore, and have a worldwide network looking at it. Adm. Edwin Dorn, commander of the Pacific Fleet, championed it. We took advantage of the fact that we were so far away from Washington and could do some innovative, novel things. The sailors and Marines experimented with using technology in different ways without the typical oversight by contractors telling them how to use it.

**Q: What metrics does the military use to decide what is a disruptive innovation?**

A: This is the metric I use in my own work: Is the measure of effectiveness very different from the usual way of viewing something? Is it viewed as inferior by those who favor the established way of doing things? Do they feel threatened? If so, to bring the technology to full maturity where it can disrupt the old way of doing things, you generally have to disguise it.

Warfare is different from business. In business, you know when you're being threatened by looking at your sales figures. In warfare, it's only when battle breaks out that you know you've been disrupted, as on 9/11. The first aircraft carriers were used only to spot for the big guns on the battleships. The visionaries of carrier aviation saw that if they could launch a bunch of aircraft at once, they could achieve a pulsed strike as opposed to continuous, aimed gunfire from a battleship. To get the battleship Navy to agree to build more carriers, they argued they could do a better job of reconnaissance with more aircraft. They didn't tell the battleship guys they were going to put them out of business. They essentially disguised their new metric of effectiveness until they actually got enough carriers together to put 80 or 100 aircraft in the air at the same time.

**Q: What do you think will be the contribution of unmanned aerial vehicles and aimable microsattellites?**

A: Potentially, UAVs and microsats linked in a novel way could represent a tremendous disruptive innovation. The question is, how do the people who fly aircraft for the Air Force and Navy feel about UAVs with missiles being controlled by somebody half a world away? Usually there's a bureaucratic constraint or impediment to getting these new things. Our top military leaders should be spending 90 percent of their time managing and sustaining things. We only need about 10 percent of our people doing disruptive things, or we'd always be disrupting and never get anything done. The key is, how does a senior leader manage that 10 percent of disruption? Those are the people who are visionary and very interesting to study. We're fortunate in the way we're organized right now, with joint forces, that when we see something we'd like to pursue, the funding is there. We're going to use precipitating technologies to decloak the terrorists.

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## References

1. Susan M. Menke, "[DOD developing 'disruptive tech'](#)" *Government Computer News*, March 7, 2005; Vol. 24 No. 5.
2. Terry C. Pierce, [Warfighting and Disruptive Technologies: Disguising Innovation](#) (London, England: Frank Cass Publishers, 2004).