

## Net-Centric plus Network Optional Yields Mission Agile EMCON

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### Situation

The scenario used for 2015 is the same as the scenario used for 2014 (and 2013). The major difference is that this 2015 class project explicitly examines a mixed EMCON approach that consists of appropriate RF and appropriate non-RF communications methods. Other differences will be highlighted below.

As before, China has used aggressive tactics towards nations that dispute China's assertion of sovereignty over much of the South China Sea (SCS). At times, these actions have ignored or violated widely accepted international maritime law. Chinese maritime acts have impinged on accepted use of waterways in the SCS by those nations having legitimate interests. Nations with sovereign interests (claims) in the SCS include the Philippines, Brunei, Malaysia, Vietnam, and Taiwan.

The 2015 scenario assumes that China has violated international law by conducting intimidating acts in the South China Sea, including the building of port and airbase facilities on disputed islands and reefs. This assumption, of course, has become reality during CY2014 and the beginning of CY15. China has seized control of Flat Island and Commodore Reef, areas claimed by the Philippines and contested by US coalition partners. Hostile action has been non-lethal thus far, with Filipino forces giving way to PRC combatant forces. The international community is alarmed and the US has responded with naval and air forces.

This policy requiring U.S. naval presence in the SCS is expected to stem the tide of Chinese aggression toward U.S. allies and steer Chinese behavior towards compliance with international maritime laws and treaties. An adaptable force package of *Victory Class* missile boats, coastal patrol vessels, and overwatch assets are expected to fulfill the range of U.S. naval requirements to shape Chinese behavior in the South China Sea. The range of activities may consist of presence patrols to the conduct of unrestricted naval warfare. The operating area between Flat Island and Commodore Reef, inclusive of sufficient area around each, will be divided in two, with one Wolfpack operating in each half of the op area. Each Wolfpack consists of four missile boats, two coastal patrol boats, and one logistics support vessel, such as an LCS.

The critical adversary assumptions for mission planning are that the PLA Navy will not desire to escalate disputes to conflict and should conflict materialize, they will not escalate beyond maritime warfare. Critical friendly assumptions are that 1) at least one Carrier Strike Group or Expeditionary Strike Group will be available to support U.S. and allied missile and patrol coastal vessels (but the CSG/ESG will remain outside the approximate range of Chinese anti-carrier missiles), 2) Singapore will support a shore-based (and, if necessary, afloat) Tactical Operations Center (TOC) for C4I, 3) allied navies will welcome U.S. leadership and forces while providing their own assets for coalition operations, 4) the conflict will last no longer than 60 days, 5) U.S. assets will have 80% availability throughout the conflict period, 6) the U.S. forces will have very limited uplink capabilities to space-based communications resources while

operating in the SCS but will have some reachback capability to be explored below, and 7) mining of ports and waterways by U.S. forces will not occur.

### Mission

On order, JTF Wolfpack and coalition forces will ensure freedom of navigation and access for the United States and allied countries in the South China Sea, protect friendly shipping that conforms with established or accepted international maritime legal regimes or treaties, and enable natural resource utilization that is allowed under international law or treaty, and/or bi-lateral or multi-lateral agreement. Where authority permits, maritime interdiction operations (MIO)/vessel board, search, and seizure (VBSS) operations will be conducted. Be prepared to conduct full-scale military operations against the PLA Navy.

### Execution

Flat Island and Commodore Reef are approximately 150 nautical miles apart, which will stretch communications capabilities for the Wolfpack flotilla similar to the 2013 and 2014 scenarios. Absent hostilities, U.S. and coalition forces are expected to provide presence, escort of vital shipping, and protect lawful fishing or other maritime activity undertaken by friendly forces and nations. U.S. naval forces are expected to play a role, when appropriate and primarily in support, in enforcing sovereign interests of coalition forces through ship rider operations, exercises, and combined patrols or other agreed-upon maritime activities to that which 7<sup>th</sup> fleet, PACOM, or the U.S. missions among coalition nations agree.

Upon declaration of hostilities, U.S. forces and coalition partners will intercept and neutralize Chinese surface and air supply chain platforms. Sub-surface operations are expected to prevent PLA naval forces from reinforcing those assets or capabilities already in place or operating throughout the SCS. Missile boats will be utilized to destroy land and sea capabilities resident throughout the SCS or destroy naval and air platforms that have slipped past layered naval capabilities should intelligence, surveillance, and reconnaissance capabilities fail to warn about PLA assets approaching and entering the SCS.

### Administration

Wolfpacks will be subordinated to a supported commander, a Commodore serving as a Joint Task Force Commander under 7<sup>th</sup> fleet with both an ashore and afloat headquarters based in Singapore. 7<sup>th</sup> fleet will maintain overwatch, operational control, and provide support to the JTF through 7<sup>th</sup> fleet's established Maritime Operations Center (MOC) while also maintaining operational control of the CSG/ESG.

The O-7 Commodore will be augmented by a complete JTF numbered staff to include a deputy O-6. Each *wolfpack* will have an O-5 squadron commander designated. Installations and platforms will have appropriate detachments deployed to support capabilities such as *Scan Eagle* UAVs.

### Communications to support Command and Control

The primary thrust of this year's project is to evaluate the details of alternative communications capabilities to support the command and control structure outlined above. We

began by starting from the communications capabilities assumed in last year's project. This is reproduced below in italics:

*Line of Sight (LOS) communications are suitable in the area at VHF and UHF frequency bands with coalition assets VHF capable. Where UHF is insufficient, theatre-based Broad Area Maritime Surveillance (BAMS) platforms will act as UHF relay. Both internal and external communications between wolfpacks and air asset communications will be conducted over these frequencies. Systems such as Link 4A/11, Maritime Air Distress (MAD), and Automated Identification System (AIS) will also operate within these frequency ranges. While uplinking to SATCOM is expected to be minimally available, if at all, the downlink is expected to be accessible by squadron assets and will operate over UHF frequency bands. Visual signals will also be used as conditions require including flag/semaphore, lights, and flaghoists. QR codes will be utilized as appropriate.*

*Intra-squadron communications, under severe SATCOM uplink jamming, can be provided by an aerial mobile adhoc network (MANET) using 802.16 as the primary means of data communications. Use of a rotary wing UAS system, comparable to a small Fire Scout, would enable MANET use while supporting the pointing accuracy required for 802.16 MANET.*

*Long Haul communications will be conducted over HF frequency bands, to include Battle Force Email (BFEM). If commercial uplink is available, the Commercial Broadband Satellite Program (CBSP) would fulfill critical needs among the Wolfpack assets and the ashore/afloat TOCs. Should strict emission control (EMCON) measures become necessary, Scan Eagles may act as "carrier pigeons" by flying messages between platforms.*

This year's class was divided into RF and non-RF groups and asked to explore C2 issues in a scenario where we were trying to prevent conflict by "holding at risk" aggressors in a complex political and geographic situation described above. In last year's scenario, high power jamming only originated from the mainland. Developments in the past few months caused a change in that assumption: all SATCOM uplinks are at risk within 300 miles of fixed bases and large surface ships. This was how our simple communications wargame transpired: Aggressive action by nation X; Send in UAV to support ROL (Predator-Global Hawk); Lose UAV SATCOM link; Send in missile boats; Missile Boats tracked via omni-MF and VHF; Send in UAV (Shadow-Scan Eagle); Lose UAV CDL; Patrol boats to visual range – all RF comm jammed; Patrol boats exfil to establish link; Picture gone. This led us to consider a combined RF/non-RF solution.

Network Optional Communications (NOW) is comprised of the following potential methods: lasers, flashing light in various bands, underwater/acoustic, QR codes, and data muling. What we rediscovered was this is not a question of RF vs non-RF. There is a spectrum of options, and we may decide to operate at some level of EMCON to avoid detection. Or the enemy and weather may conspire to reduce the availability of our network. We found situations where there did not appear to be a viable and elegant RF solution but a hybrid combination of techniques could meet user requirements. We refer to this as Mission Agile EMCON and is shown on slide 32 of the accompanying presentation. Slide 34 presents our recommendations.

Further details of the communications supporting command and control are included in the slide presentation accompanying this description.

\*This three-page description and the accompanying slide presentation represent unclassified, open-source work performed in an academic environment for the purpose of educating graduate students. The views in this document are those of the author and do not reflect the official policy or position of the Department of Defense or the US Government.