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WILL NETWORK-CENTRIC WARFARE BE THE DEATH KNELL FOR
ALLIED/COALITION OPERATIONS?

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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The U.S. Navy is undergoing a shift in its focus from
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Introduction

> …a fundamental shift from what we call platform-centric
> warfare to something we call network-centric warfare.[1]
>   ADM Jay Johnson, U.S. Navy

In his remarks to the U.S. Naval Institute Annapolis
Seminar, the Chief of Naval Operations described his vision
for the Navy of the Twenty-first Century. Network-centric
warfare (NCW) connects sensor platforms with weapons (or
shooter) platforms in a robust network, giving a commander the
ability to match weapons to targets irrespective of platform.[2]
The proponents of NCW have labeled it a "revolution in
military affairs" that promises to fundamentally change the
way the United States conducts warfare in the future.

However, is NCW on a collision course with one of the
basic tenets of the U.S. national security and military
strategies—that of operating as part of an alliance or a
coalition? Many allies worry that the U.S. military outpaces
them already in terms of technology although common standards
have been in use for years. In the case of coalition
operations where potential partners may not be known until a
crisis occurs, the U.S. military may find itself teamed with
countries whose technical capabilities are incompatible with
its own. More fundamentally, will NCW be interoperable with

our coalition partners in terms of language, intelligence sharing, and other security issues?

Interoperability is not the only potential source of conflict between NCW and allied/coalition operations. Issues of culture, which can include national pride, a need to establish personal relationships, and a different value for time, affect coalition command and control (C2). Additionally, a nation's culture may prohibit it from subordinating its armed forces under the command and control of another country.

This paper examines the benefits that NCW brings to the operational commander and its impact on future combined operations. It will also suggest some possible alternatives for the operational commander to maximize the use of NCW without precipitating the demise of allied/coalition operations.

A definitional note is appropriate here. As defined in Joint Pub 1-02, a coalition is an "...*ad hoc* arrangement between two or more nations for common action."[3] An alliance, on the other hand, is a formal agreement between nations formed to achieve long-term objectives of common interest to all parties.[4] For purposes of simplicity, the use of the term

coalition in this paper will focus on commonality of purpose, referring to both "allies" and *ad hoc* coalition forces.

Network-Centric Warfare

While the concept of NCW is still in evolution, there are three areas of interest in relation to its use with coalition operations. First, although the exact relationship is yet to be determined, Vice Admiral Cebrowski suggests that linking forces together in a network will increase combat power.[5] Harnessing the power of these networked forces concentrates the most effective combat power at the decisive point and realizes the principle of mass. An NCW capable coalition partner will directly contribute to this increased combat power as part of the overall network.

Second, networked forces share and exchange information, greatly accelerating "speed of command." Speed of command is the ability to sense information, evaluate it, and then act on it in a decisive manner before the enemy has a chance to react. Again, NCW capable coalition forces directly contribute to speed of command as part of the network.

Lastly, NCW enables synchronization. In fact, Vice Admiral Cebrowski touts "self-synchronization" as the ability of networked forces, sharing information, to organize "from

the bottom up…to meet the commander's intent."[6] An example of both speed of command and self-synchronization at the operational level of war is found in *Operation Desert Storm*. During the ground war, U.S. Marine forces were advancing on Kuwait City more rapidly than anticipated, potentially endangering an Egyptian unit. Liaison officers in the coalition war room recognized the problem and contacted the Egyptian forces to warn of the Marines approach.[7] "Speed of command" at the operational level averted a potential tragedy. Had the multinational forces been networked, they also may have discovered the potential meeting engagement themselves and "self-synchronized."

Because the majority of U.S. involvement in conflicts since World War I has included multinational operations, it is reasonable to assume that the next war fought under the NCW doctrine will need to consider combined forces in the operational plan. Much has been written about some of the challenges of and considerations for acting as part of a multinational force. In particular, interoperability and command and control (C2) are the most likely points of friction between NCW and coalition operations.

Network-Centric Warfare and Interoperability in Coalition Operations

Interoperability is defined as "the ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together."[8] The rapid exchange of information, in fact information technology itself, is one of the principal enablers of NCW.[9] However, it raises concerns among our allies and potential coalition partners as to their ability to stay even with the United States and contribute to future operations.

The U.S. military's budget for information technology is significantly greater than the overall defense budgets of many potential coalition nations.[10] The Naval Attaché at the Canadian Embassy in Washington, D.C., is quoted as saying that smaller navies will be "hard pressed to keep up as the USN [U.S. Navy] introduces a seemingly endless stream of new and highly automated systems."[11] Indeed, a perception exists among some allies that if they do not invest in the same technology as the United States, they will not be asked to join in multinational operations or will be viewed as a liability.[12]

Is the technology gap unbridgeable? If the combined operations include partners with whom the United States has a formal alliance, the potential for bridging the gap is more

optimistic. In reality, the U.S. military is fielding equipment that is "commercial off-the-shelf" or meets the same international standards that our allies subscribe to, enabling interoperability.[13] With the availability of commercial products in the global economy, the gap will be less about technology than about "resources." That is, the willingness of an allied government to fund the newest technology, either from its own defense industry or the United States, is the more likely factor affecting the technology disparity.[14]

Where the coalition is composed of *ad hoc* partners, the technology challenge will be greater unless the partner nations subscribe to international standards. The United States has the option to provide the necessary equipment and training to potential coalition partners, through either a loan or grant, but such an option may be cost-prohibitive. While not the best option for planning purposes, however, innovative personnel manage to solve the technical problems "on the battlefield."[15]

Interoperability is not about technology compatibility alone, but also includes issues such as intelligence sharing, security classification, language, and rules of engagement. Sharing intelligence is not a trivial problem since many countries are not willing to share either their intelligence

sources or products with other nations. When operating with a formal alliance, procedures for sharing intelligence while protecting sources are generally well established and feasible.[16] The operational commander will have to be flexible when working with *ad hoc* partners who may have "cultural norms concerning secrecy and exclusivity."[17] In the Gulf War, the Coalition Coordination, Communication, and Integration Center (C^3IC) provided a place to integrate the staffs of the coalition forces for a multitude of staff planning functions. It was a venue for intelligence sharing[18] and serves as a model for the commander in future operations.

Concerning security classification, the dilemma is twofold—technology and policy. While true multi-level security is yet to be achieved, technology exists today, which allows dissemination of sanitized classified information to allies and coalition partners.[19] Over the past several years the Joint Warrior Interoperability Demonstration Coalition Wide Area Network (CWAN) demonstrated real-time information exchange between several nations located around the world, facilitating collaborative planning and C2. Indeed, this network connection was confirmation that NCW is not only possible with coalition forces, but also highly desirable. The only negative aspect of the CWAN demonstration was that

the "network" was segregated and separate from the U.S. networks according to its security policies. In a real conflict, this network separation would require manual intervention to pass data between United States and coalition forces, introducing delay and opportunity for errors. Alternatively, the United States could choose to shift all of its planning to a CWAN-like network, eliminating this problem.[20]

The United States security classification policy is one of risk prevention as opposed to a risk reduction approach.[21] However, the policy does permit an operational commander to release classified information to allies in combined operations in combat.[22] While it does not permit the commander to train his forces as they will fight, the policy will mitigate the impact of classification on coalition operations in times of crisis.

Another seemingly insurmountable barrier to interoperability is language. The operational commander must ensure that communication between coalition partners is clearly understood in both syntax and meaning. In addition to designating one language as the "common operating language" as General MacArthur did in the Korean War,[23] all parties should exchange liaison officers and translators. In the Gulf War,

the C³IC provided this function, translating to and from the
common operating language of English. Additionally, the
liaison officers in the C³IC served as a source of translation
for common military terms to minimize any confusion over
meaning.[24]

Finally, rules of engagement (ROE) may limit coalition
participation in the network. For example, during the Gulf
War, law prohibited the Argentine Navy from "engaging in
direct warfare actions."[25] The commander must determine, in
the context of NCW, if such ROE would prohibit a coalition
unit from acting as a "sensor," while refraining from action
as a "shooter."

In summary, the challenges of interoperability in
potential NCW operations with coalition forces are similar to
those facing the operational commander in the past. Each
operation requires an evaluation of every nation's ability to
contribute to the network and assignment of mission tasks
accordingly. Options for the commander in the case of nations
that are unable to participate in the network directly will be
discussed later.

Network-Centric Warfare and Coalition Command and Control

Given the prevalence of coalition operations in our
history, much has been written about the unique challenges for

C2 in the combined environment. Some of the issues such as language and ROE discussed above under interoperability are germane to C2; however, this section of the paper will focus primarily on two additional aspects of C2—subordination of forces and culture.

Many countries are unwilling to subordinate their nation's armed forces to the command and control of another country's commander. In some cases, the issue is as simple as not wanting to appear to be a "puppet"[26] of the coalition leader. Accordingly, Joint Pub 3-0 describes a parallel command structure where nations retain control over the forces they have contributed to the operation.[27] This was the command structure used in *Desert Shield/Desert Storm* where forces from the Arab nations were subordinated to Saudi Arabia and Western forces (with exception of France) were assigned under command of the United States.

A parallel C2 structure poses a challenge to NCW in that speed of command and self-synchronization lead to "control" of forces. The operational commander may retain NCW by establishing parallel "networks." Within each respective network, coalition forces would be controlled according to their national policies regarding C2 while preserving the combat power of NCW. The commanders of the parallel C2

structures must then establish a means to exchange information similar to the Gulf War's C³IC.

Even if a nation agrees to subordinate its forces to the coalition commander, it may retain the right to approve any orders directed to its forces,[28] potentially slowing planning at the operational level. The commander can minimize the delay by working draft plans through his liaison staff, obtaining a set of pre-approved actions that will not have to be routed back to the coalition nation's command authorities. Alternatively, a commander may negotiate a command structure that provides unity of effort, but allows the coalition force commander to "appeal" decisions to the partner's national command authority, obviating the need for every issue to be blessed by higher authority.

Cultural differences between coalition partners may be rooted in national history, religious beliefs, social mores, and issues of "face" or pride. For example, in Saudi Arabia, it is customary to develop a personal relationship before an atmosphere of trust and cooperation is attained.[29] Unless he has been able to foster such a relationship before a coalition is formed, the commander must act quickly to establish the appropriate atmosphere so that coalition forces feel comfortable as part of the network. An active program of

multinational exercises would be invaluable for building these important ties before a conflict arises.

The concept of time also affects coalition C2. Some potential partners do not value high tempo operations and subscribe to doctrine that is highly centralized and rigid,[30] thereby prohibiting "automated" (read NCW) C2. Lieutenant Commander James Kuhn suggests that mission-oriented C2 is most appropriate for NCW. The operational commander issues his intent and mission guidance, but empowers the subordinate commander to adjust his actions (within the superior's intent) due to the speed of command and self-synchronization at the tactical level.[31] This form of C2 will work in an NCW-coalition environment provided all forces report to one commander and where the partners' cultures respond well to the rapid tempo of NCW.

If a coalition partner is unable to accept centralized guidance (the Commander's Intent) and turn it into decentralized action, a different role must be determined. The next section will discuss some planning strategies for the operational commander when confronted with potential operations involving NCW capable forces that are acting in a coalition environment.

Options for the Operational Commander

In preparing his operational scheme, the commander has several options in planning for coalition operations and NCW. If all of the coalition partners are NCW capable and there are no interoperability or C2 issues, then the planning may proceed as normal. This is the best case scenario as it capitalizes on the increased power of the networked forces.

If the United States has the only NCW capable force, then the commander has the option to have it act unilaterally. The major advantage to this option is that the commander is dealing with a synthesized force capable of massing tremendous effects and the planning process is simplified.

The disadvantages of this option are numerous. First, it ignores the national strategic guidance to participate in coalition partnerships. Additionally, the United States may find it difficult to establish legitimacy for its actions without coalition support. Lastly, acting alone would entail the United States assuming all of the risk of the operation.

Even if a coalition partner is not able to add to the power of the network directly, it may have perceived combat power that should be used to contribute to the overall effort. One option would be to use a coalition partner to cover an existing mission while the U.S. NCW capable force is otherwise

engaged. For example, during the Gulf War, NATO ships provided presence and protected the sea lines of communication in the Mediterranean while U.S. aircraft carriers were in the Persian Gulf.[32]

The most likely scenario involving NCW and coalition operations will be similar to today's operations—the coalition members will have different levels of capability to contribute to the mission. In this case, the commander may organize the forces into NCW and non-NCW capabilities and assigns missions accordingly. Non-NCW capable forces can be assigned a sector separate from the NCW battlespace, such as the coalition navies were assigned during the Maritime Interdiction Operations of the Gulf War. This "geographic" separation would prevent non-networked forces from friendly fire in the "fog of war," since they would be unable to self-synchronize with NCW capable forces.

The advantages to this approach are that the NCW-capable forces mass effects as required while other coalition partners contribute to the overall effort. Again, this option would put the majority of risk on NCW capable forces. Additionally, care must be taken to ensure non-NCW assigned forces have duties commensurate with national objectives.

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Conclusion

Along with its benefits, NCW also poses some challenges to the commander that range from technology mismatches to cultural restrictions or barriers. In this sense, it is no different than many of the other factors a commander must consider when planning coalition operations.

Indeed, a coalition partner's ability to participate in NCW is similar to the current state of operational planning where forces come to the fight as they are and the commander must determine the best way to balance their strengths and weaknesses and national objectives. In 1947, General Jacob L. Devers wrote that combined operations

> ...tax [the commander's] native ability, professional skill, and patience to an unbelievable degree. For this reason alone, a Theater Commander charged with conducting combined operations must be possessed of unquestioned ingenuity, professional skill, tact, good judgment, and patience.[33]

Network-centric warfare is simply another factor to challenge the operational commander when planning coalition operations, requiring significant operational leadership. Network-centric warfare and coalition operations may coexist, if not peacefully, then at least in cautious harmony. To paraphrase the old saying, "rumors of the death of coalition warfare are premature."

Notes

[1] As quoted by VADM Arthur K. Cebrowski, USN, and John J. Garstka, "Network-Centric Warfare: Its Origin and Future," U.S. Naval Institute Proceedings, January 1998, 29.

[2] Leslie West, "Exploiting the Information Revolution: Network-Centric Warfare Realizes Its Promise," Sea Power, March 1998, 38.

[3] Joint Chiefs of Staff, Department of Defense Dictionary of Military and Associated Terms: Joint Terminology Database as of 10 June 1998 (Joint Pub 1-02)(Washington, D.C.: 10 June 1998), 82.

[4] Ibid., 26.

[5] West, 38.

[6] Cebrowski and Garstka, 32.

[7] LtCol Marc Michaelis, USA, "The Importance of Communicating in Coalition Warfare," Military Review, November 1992, 41.

[8] Joint Chiefs of Staff, Doctrine for Command, Control, Communications, and Computer (C4) Systems Support to Joint Operations (Joint Pub 6-0)(Washington, D.C.: 30 May 1995), GL-6.

[9] Cebrowski and Garstka, 29.

[10] Thomas P. M. Barnett, "The Seven Deadly Sins of Network-Centric Warfare," U.S. Naval Institute Proceedings, January 1999, 36.

[11] Sharon Hobson, "Price of Working Together," Jane's Defence Weekly, 8 April 1995, 29.

[12] Ibid.

[13] RADM Richard Mayo, USN, "Allied Coalition Forces Interoperability" [PowerPoint presentation on-line] (Washington, D.C.: accessed 12 May 1999); available from http://copernicus.hq.navy.mil/divisions/N6/n60/it21/documents.htm (allied.ppt, slide 5).

[14] Ibid.

[15] LCDR Mark S. Woolley, USN, "Coalition Warfare: Implications for the Naval Operational Commander in the Way Ahead," (Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1992), 13.

[16] GEN Robert W. Riscassi, USA, "Principles for Coalition Warfare," Joint Forces Quarterly, Summer 1993, 70.

[17] LtCol Wayne A. Silkett, USA (Ret.), "Alliance and Coalition Warfare," Parameters, Summer 1993, 82.

[18] Ibid.

[19] For example, Radiant Mercury provides SI-GENSER-Releasable formatted data to shooters while protecting collection sources and methods, national sensitivities and foreign releasability. Scott C. Truver, "Harnessing the C4ISR Revolution," Jane's Navy International, 1 October 1997 [Jane's Online], p. 9 of 11.

[20] CDR Jay W. Chesky, USN, former Assistant for Allied Interoperability for Director, Space, Information Warfare, Command and Control, on the staff of the Chief of Naval Operations, telephone conversation with author, 13 May 1999.

[21] RADM Mayo, slide 7.

[22] Ibid., slide 11.

[23] MAJ Mark M. Kauzlarich, USMC, "Command and Control Challenges During Coalition Operations," (Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1996), 10.

[24] Michaelis, 44.

[25] CDR Juan Carlos Neves, Argentine Navy, "Interoperability in Multinational Coalitions: Lessons from the Persian Gulf War," Naval War College Review, Winter 1995, 52.

[26] Woolley, 9.

[27] VI-6.

[28] Kauzlarich, 6.

[29] MAJ Barry A. Maxwell, USA, "Establishing Theater Command and Control in a Coalition of Nations: Requirements for U.S. Doctrine," (Unpublished Research Paper, U.S. Army Command and General Staff College, Fort Leavenworth, KS: 1991-92), 17.

[30] Capt. David E. A. Johnson, USA, "Cross-Cultural Communication in Coalition Warfare," Special Warfare, July 1993, 10.

[31] LCDR James K. Kuhn, USN, "Network Centric Warfare: The End of Objective Oriented Command and Control," (Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1998), 15.

[32] RADM Joseph C. Strasser, USN, "The Role of Naval Forces in Combat," in Naval Forward Presence and the National Military Strategy (Annapolis, MD: U.S. Naval Institute Press, 1993), 256.

[33] GEN Jacob L. Devers, USA, "Major Problems Confronting A THEATER COMMANDER In Combined Operations," Military Review, October 1947, 3.

Selected Bibliography

Barnett, Thomas P. M. "The Seven Deadly Sins of Network-centric Warfare." U.S. Naval Institute <u>Proceedings</u>, January 1999, 36-39.

Blake, J. "Joint Warrior Interoperability Demonstration 1997 (JWID 97) - A UK Perspective." <u>NATO's Sixteen Nations 42</u>, no. 3 (1997): 77-79.

Cebrowski, Arthur K. "C4 in the US Navy - A Look into the 21st Century." <u>NATO's Sixteen Nations 42</u>, no. 3 (1997): 56-59.

Cebrowski, Arthur K. and John J. Garstka. "Network-Centric Warfare: Its Origin and Future." U.S. Naval Institute <u>Proceedings</u>, January 1998, 28-35.

Chesky, Jay W. Former Assistant for Allied Interoperability for Director, Space, Information Warfare, Command and Control, on the staff of the Chief of Naval Operations. Telephone conversation with author, 13 May 1999.

Codner, Michael. "Integration and Interoperability: The Who and the What." <u>RUSI Journal</u>, October 1996, 35-38.

Devers, Jacob L. "Major Problems Confronting A THEATER COMMANDER In Combined Operations." <u>Military Review</u>, October 1947, 3-15.

Hains, Thomas J. "The Widening Gap of Interoperability Between US and Coalition/Allied Communications Systems: A Challenge for the Commander." Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1997.

Hobson, Sharon. "Price of Working Together." <u>Jane's Defence Weekly</u>, 8 April 1995, 28-29.

Johnson, David E. A. "Cross-Cultural Communication in Coalition Warfare." <u>Special Warfare</u>, July 1993, 9-11.

Kauzlarich, Mark M. "Command and Control Challenges During Coalition Operations." Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1996.

Kuhn, James K. "Network Centric Warfare: The End of Objective
     Oriented Command and Control." Unpublished Research
     Paper, U.S. Naval War College, Newport, RI: 1998.

Maxwell, Barry A. "Establishing Theater Command and Control in
     a Coalition of Nations: Requirements for U.S. Doctrine."
     Unpublished Research Paper, U.S. Army Command and General
     Staff College, Fort Leavenworth, KS: 1991-92.

Mayo, Richard. "Allied Coalition Forces Interoperability."
     Washington, D.C.: Chief of Naval Operations Staff.
     PowerPoint presentation on-line. Available at
     http://copernicus.hq.navy.mil/divisions/N6/n60/it21/
     documents.htm (allied.ppt).

Michaelis, Marc. "The Importance of Communicating in Coalition
     Warfare." Military Review, November 1992, 40-50.

Neves, Juan Carlos. "Interoperability in Multinational
     Coalitions: Lessons from the Persian Gulf War." Naval
     War College Review, Winter 1995, 50-62.

Rice, Anthony J. "Command and Control: The Essence of
     Coalition Warfare." Parameters, Spring 1997, 152-167.

Riscassi, Robert W. "Principles for Coalition Warfare." Joint
     Forces Quarterly, Summer 1993, 58-71.

Silkett, Wayne A. "Alliance and Coalition Warfare."
     Parameters, Summer 1993, 82.

Strasser, Joseph C. "The Role of Naval Forces in Combat." In
     Naval Forward Presence and the National Military
     Strategy, ed. Robert L. Pfaltzgraff, Jr. and Richard H.
     Schultz, Jr., 251-263. Annapolis: U.S. Naval Institute
     Press, 1993.

The White House. A National Security Strategy for a New
     Century. Washington, D.C.: 1998.

Truver, Scott C. "Harnessing the C4ISR Revolution." Jane's
     Navy International, 1 October 1997 [Jane's Online].

U.S. Joint Chiefs of Staff. Department of Defense Dictionary
    of Military and Associated Terms: Joint Terminology
    Database as of 10 June 1998 (Joint Pub 1-02) Washington,
    D.C.: 10 June 1998.

U.S. Joint Chiefs of Staff. Doctrine for Command, Control,
    Communications, and Computer (C4) Systems Support to
    Joint Operations (Joint Pub 6-0) Washington, D.C.: 30
    May 1995.

U.S. Joint Chiefs of Staff. Joint Vision 2010. Washington,
    D.C.

U.S. Joint Chiefs of Staff. National Military Strategy of the
    United States of America. Washington, D.C.: 1997.

Van Riper, Paul K. "Information Superiority." Marine Corps
        Gazette, June 1997, 54-62.

West, Leslie. "Exploiting the Information Revolution:
    Network-Centric Warfare Realizes Its Promise." Sea Power,
    March 1998, 38-40.

Woolley, Mark S. "Coalition Warfare: Implications for the
    Naval Operational Commander in the Way Ahead."
    Unpublished Research Paper, U.S. Naval War College,
    Newport, RI: 1992.

Yates, Mark B. "Coalition Warfare in Desert Storm." Military
Review, October 1993, 46-52.