

# MASTER OF SCIENCE IN SYSTEMS TECHNOLOGY

---

## ORGANIZATIONAL FITNESS OF A PROPOSED NETWORK CENTRIC ORGANIZATION

**Alistair R. Borchert-Lieutenant Commander, United States Navy**

**B.S., University of Washington, 1988**

**Master of Science in Systems Technology-December 1998**

**Advisors: Carl R. Jones, Information Systems Academic Group**

**LtCol John H. Gibson, Command, Control, Communications, Computers, and Intelligence Academic Group**

Network Centric Warfare (NCW) has emerged as a new concept for the U.S. Navy. NCW capitalizes on technology to obtain and maintain an enhanced situational awareness and uses the distributed offensive firepower of the collective force to fight the battle. Speed of Command and Self-Synchronization are key tenets of NCW. The author proposes an organization designed to operate in the NCW environment. It consists of the Force Commander and commanders of Situational Awareness, Resources, Effects, and Operations. The research question of this thesis is whether or not the proposed organization is fit in the NCW environment. The organization is looked at in two "snapshots": one is the planning process and the other is the execution process. The expert system Organizational Consultant is used to analyze the organization and determine its organizational fitness. The results indicate that the proposed organization is fit if changes are made to make the planning process highly centralized and the execution process decentralized. Formalization will also need to be lowered in the organization.

**DoD KEY TECHNOLOGY AREA:** Command, Control, and Communications

**KEYWORDS:** Network Centric Warfare, Organizations, Organizational Consultant

## VERIFYING THE BIOLOGICAL WEAPONS CONVENTION (BWC): THE ROLE OF TECHNOLOGY IN BIOLOGICAL ARMS CONTROL

**Michael J. Schiller-Lieutenant, United States Navy**

**B.S., Worcester Polytechnic Institute, 1992**

**Master of Science in Systems Technology-December 1998**

**Advisors: James J. Wirtz, Department of National Security Affairs**

**Xavier K. Maruyama, Department of Physics**

The Biological Weapons Convention of 1972 prohibits the possession and use of biological agents in war, but does not contain provisions for enforcement. The Protocol to the BWC, an effort to improve enforcement of the treaty, has defined specific mechanisms for verification. This thesis examines the potential for technology to support treaty verification. First, the history of the treaty and efforts to improve it are discussed. Second, the requirements for technical support of verification are examined, and criteria are developed to evaluate potential detection systems. Then, technologies for detection and identification are illustrated, including an evaluation of currently available systems. A procedure for the implementation and support of verification technology is provided. This approach demonstrates a specific process of employing technology to enhance deterrence and verify compliance with the BWC.

**DoD KEY TECHNOLOGY AREAS:** Chemical and Biological Defense, Sensors

**KEYWORDS:** Arms Control, Verification, Proliferation, Biological Weapons, Biological Warfare, CBR Defense, Sensors, Detection Technologies, Technical Intelligence, MASINT, Weapons of Mass Destruction

## **MASTER OF SCIENCE IN SYSTEMS TECHNOLOGY**

---

### **INFRARED EXPLOITATION OF DIESEL SUBMARINES (U)**

**J. Mitch Stubblefield-Lieutenant, United States Navy  
B.S., United States Naval Academy, 1993**

**Master of Science in Systems Technology-December 1998**

**Advisors: Richard C. Olsen, Department of Physics**

**Dan C. Boger, Command, Control, Communications, Computers, and Intelligence Academic Group**

Diesel submarines pose a significant risk to the U.S. Navy. Tracking them is an important function for the intelligence community. Knowing when a diesel is going to leave port is valuable information, but it is often extremely hard to obtain. Analysis of a diesel submarine's thermal signature may help in this effort.

This thesis analyzes a specific diesel submarine to determine if it has a thermal signature that can be used to predict when it will deploy. The analysis encompasses the submarine and its surrounding environment. The submarine's thermal signature revealed a modest amount of information regarding its readiness status, but it was not useful in predicting when the submarine was going to deploy.

**DoD KEY TECHNOLOGY AREAS:** Space Vehicles, Other (Intelligence, Indications and Warning (I&W))

**KEYWORDS:** Imagery Intelligence, Remote Sensing Infrared, Iranian Naval, KILO SS