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Command and Control Systems in the Mexican Navy

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COMMAND AND CONTROL SYSTEMS IN THE MEXICAN NAVY

Introduction

Command and Control (C2) is fundamental for the development of Naval Operations of the Mexican Navy since it is the tool that allows a Commander to understand the situation in the Theater of Operations (TO), select a Course of Action (CoA), transmit his orders and intentions, follow up on their execution and evaluate the results obtained. For this reason, the Institution has a Program to Strengthen the Command and Control System through which Tactical Data Linkage Systems of the Mexican Navy (SEDATAM) are supplied to the Command and Control Center of the General Staff (CC2), to the Command and Control Rooms of the Naval Commands (SC2) and the Operational Units. The SEDATAMs make it possible to acquire and exchange tactical information between Commands and Units to obtain a Common Operational Picture (POC) of the Area of Operations, one of the essential factors for exercising Command and Control.

However, in addition to the supply of SEDATAM to the Naval Commands and Operational Units, to adequately exercise Command and Control of the operations, an essential component is required: The Personnel, represented by the operators of such systems, who must be duly trained in their use, have a complete command of the C2 Doctrine and Procedures and be appropriately directed by the Shift Captain of the CC2 or SC2 of the Naval Command that has the operational control.

The present research work focuses on the personal component of the Command and Control system of the Mexican Navy, analyzing the impact that the deficient use of SEDATAMs has on naval operations.

Question

What has been the impact on the Command and Control (C2) of the Mexican Navy due to the deficient use of the Tactical Data Linkage Systems (SEDATAM)?

The present research work seeks to improve the Command and Control (C2) exercised by the Naval Commanders during Naval Operations, identifying the causes that prevent the SEDATAM operators of the Command and Control Rooms (SC2) and the Operational Units from adequately exploiting their functionalities and benefits.

This research would improve the Command and Control exercised by the Naval Commands during the operations carried out with the units under their operational control that have SEDATAM, and therefore, would contribute to the fulfillment of the mission of the Mexican Navy.

1.- For the development of this work, it is essential to know the main concepts found in the Command and Control Doctrine (C2) of the Mexican Navy and identify the components, functions, and characteristics of C2. This analysis will serve to locate the personal piece of C2, which constitutes the fundamental element of this research. We will also review some concepts of Command and Control of the United States Department of Defense (DoD) since,

in many cases, they have served as a reference for the implementation of concepts in the C2 Doctrine of our Institution.

C2 Doctrinal Concepts

Command and Control is the authority and direction exercised by the Commander over his forces for the accomplishment of a mission and its functions are applied in a chain of command, with specialized personnel, equipment and systems, doctrine and specific procedures that the Commander employs to plan, direct, coordinate and control his forces and their operations (DAM 1.0-C, 2010)¹. As we can appreciate, this doctrinal definition establishes that the personnel participating in the C2 of the Mexican Navy must be specialized, which tells us about the importance of their adequate training and qualification.

The C2 Doctrine of the Mexican Navy establishes that Command and Control is the tool that allows a Commander to understand the situation in the Theater of Operations, select a course of action, transmit his orders and intentions, follow up on its execution and evaluate the results obtained; Its purpose is to provide the Commander with the available information on what is happening in the area of operations and to provide him with the means to conduct and supervise, in order to support the planning of naval operations and exercise his control and supervision, as well as to conduct an immediate response operation in an expeditious and effective manner, in the face of a crisis or incident situation (DAM 1. 0-C, 2010)².

The main component of C2 is Command, which comprises authority and responsibility for the use of available resources and for planning the employment of operational forces, as well as their organization, direction, coordination, and control for the fulfillment of the mission. The second component is Control, an action through which the Commander conducts the development of operations, decides what is to be done, and exercises leadership over his personnel.

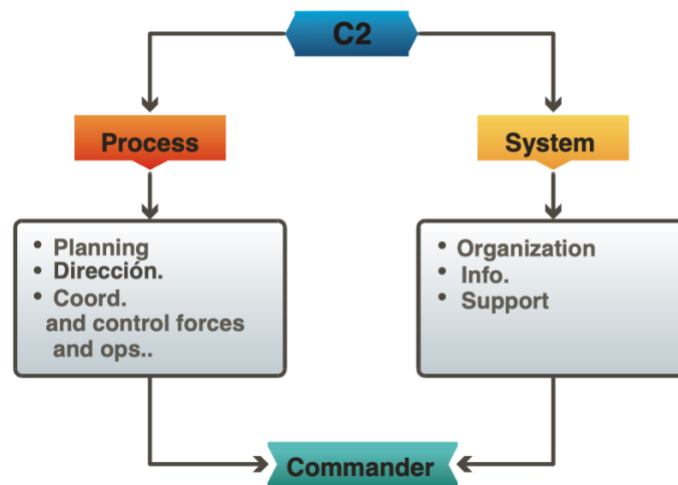
While the purpose of C2 has remained the same over time, its importance, and the means of executing its functions have changed significantly over the years (Hayes, 2006)³. These changes are a result of the evolution of the C2 approach, advances in technology, force capabilities, and the environment in which operations are conducted.

In the Mexican Navy, the Commander is the fundamental entity of the C2 around which the two elements that compose it are established: The Process, which includes the planning, direction, coordination, and control of forces and operations; and the System, which includes the personnel, equipment, communications, facilities, and procedures employed by the Commander. It follows that the commander is part of both the process (deciding what to do) and the system (ensuring that his decisions are executed).

¹ Secretaria de Marina. "Mando y control". Enero 2010

² Secretaria de Marina. "Mando y control". Enero 2010

³ Hayes, D. S. Understanding Command and Control. Washington DC: CCRP. 2006



Source: DAM 1.6 Mando y Control Operacional (2011).

Command and Control Support

C2 support comprises personnel, systems, and resources that support information flow and processing. Its primary purpose is to enhance commanders' decision-making and execution skills and support operations to counter enemy C2 capabilities.

C2 support systems and resources refer to Information and Communications Technologies (TICs) and consist of information systems, equipment, software, and infrastructure that enable the acquisition, production, communication, and recording of information and support the Commander in exercising authority and control over assigned forces. TICs integrates the concrete structure that supports the C2 process. Although it must be highly automated, it is designed to support people, giving them access to information and helping them to make effective use of it.

The C2 system has TICs with the capacity to exploit all the information to which it has access about what happens or may happen in the operations area, and for the purposes of this paper, we will address the specific case of the SEDATAMs. It is essential to emphasize that ICTs, as advanced and powerful as they may be in themselves, do not eliminate people from the C2 process but rather improve their performance to fulfill their functions more effectively within that process.

Personnel is considered a key element in the C2 system, so they must be carefully selected, organized, and trained under schemes that ensure optimal performance (DAM 1.6 Operational Command and Control, 2011)⁴. Hence, this paper will focus on analyzing the

⁴ Secretaria de Marina. "DAM 1.6 Mando y control Operacional". 2011

performance of the Personnel element since we can see that it has a predominant role in the whole C2 Cycle.

Levels of application of Command and Control in the Mexican Navy

The Naval Commands conduct operations according to a clearly defined organization and mission. The following describes each of the levels at which Command and Control are exercised in the Mexican Navy.

Strategic Command and Control

It corresponds to the High Command, through the General Staff of the Navy from the Command and Control Center (CC2), which is the primary tool of the High Command to execute the C2 process at the strategic level.

CC2 has personnel and TICs where information from various national and foreign sources is received and processed to obtain and keep the situation updated at the strategic level and follow up on the operations carried out by the Naval Commands. The personnel involved in this process is of great importance since it is their responsibility to exploit the functionalities of the TICs at their disposal to obtain and keep the POC updated, as well as the transmission of orders; the operators are under the orders of the Shift Captain, who is responsible for the correct operation of the Center.

Operational Command and Control

The Naval Forces and Commands in Mexico exercise the Operational Command and Control in their respective jurisdictions. The fusion of the conceptual parts, process, and system of C2 allow creation for those who exercise command at any level, a tool that facilitates decision making through the integration of the POC (DAM 1.0-C, 2010)⁵. All the Naval Commands of the Mexican Navy are interconnected through their respective Command and Control Rooms (SC2) with the Command and Control Center of the General Staff of the Navy (CC2). Since the C2 Cycle is a continuous process, all phases of it are active in each Command echelon. Each Commander will gather information, develop situational awareness, and plan for future operations while executing current operations.

It is up to the SC2 of the Naval Forces, Regions, Zones, and Sectors to provide C2 support to their respective Commanders, to whom the operational C2 is attributed. These SC2 have a team of operators of the different systems, among them SEDATAM, and are under the direction of a Shift Captain, who is the personal component of the C2 and constitutes the object of study of the present work.

Tactical Command and Control

The Command and Tactical Control correspond to the Commander in the area of operations, and the primary tool he has to obtain the POC is the Mexican Navy's Data Linkage System.

⁵ Secretaria de Marina. "DAM 1.0-C". 2010

The DAM 1.6.2 Tactical Data Link System of the Mexican Navy establishes the guidelines and allows the Commanders its efficient use, describes its functions, responsibilities, scopes, and limitations as a Command and Control tool that supports Decision Making.⁶

Command and Control apply to the Strategic (High Command), Operational (Naval Commands), and Tactical (Commander in the Theater of Operations) levels.

SEDATAM, properly employed, can integrate and process tactical information to obtain and share the POC between Units and Commands, providing them with timely, truthful, and reliable information that facilitates Decision Making, which is the purpose of Command and Control. This implies an adequate performance on the SEDATAM operators, which is the essence of the present work.

The Command and Control Program of the Mexican Navy has made substantial progress in the Equipment component, with a considerable investment of resources to acquire and/or develop SEDATAM for the Naval Commands and Operational Units, to the point of reaching technological independence in development, production and support. However, regarding Doctrine and Procedures, and even more so in the Personnel component, progress has not been in the same proportion.

Currently, to become a SEDATAM operator, the personnel designated by their Command or Unit only receive brief training by the System developers during the delivery-reception process. This training covers familiarization with the functionalities and operation of the consoles themselves, but not knowledge of C2 Doctrine and Procedures and this training process is insufficient.

SEDATAM Operators

SEDATAM operators are of great importance in the Command and Control process since they are responsible for exploiting the systems' capabilities, and with this, support the Command Decision Making. They must fulfill three essential functions: to adequately use the operation consoles to compile the Local Tactical Panorama (PTL), to exchange tactical information of interest with other units and/or with their Naval Command to integrate the Common Operational Panorama (POC), and to support the Commander in his Command and Control process by transmitting his orders to other units.

To achieve an effective C2, the Personnel component is key because it is the thinking element and makes possible the correct execution of the whole C2 process. Therefore, the personnel must have the necessary capabilities and competencies to perform adequately in the C2 of the Mexican Navy, according to their level of responsibility. As it has been possible to analyze through the naval operations carried out in different areas where SEDATAM personnel have been involved, it could be observed that:

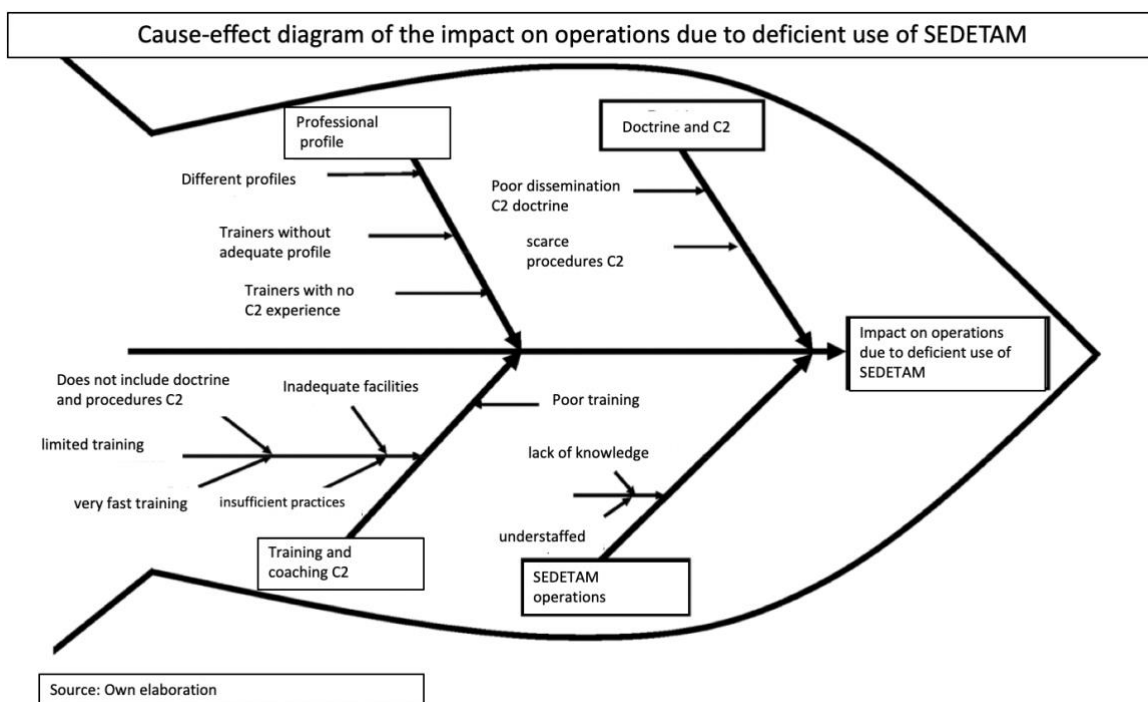
⁶ Secretaria de Marina." Sistema de enlace de Datos Tacticos de la Armada de Mexico". 2010

a) SEDATAM operators of Commands and Operational Units in general terms received training focused on the functionalities of the operating consoles but did not contemplate C2 doctrine and procedures, so they do not know how they should interoperate in a joint scenario; their training is scarce and in some Commands and Units SEDATAM is employed only when specifically ordered and not permanently, which makes it challenging to achieve the required skills;

b) CC2 and SC2 Shift Captains only partially exploit the capabilities of the systems at their disposal, since their use in some cases is sporadic and they need to strengthen their knowledge of C2 doctrine and procedures to improve their performance and supervise the implementation of the personnel under their charge;

c) on the other hand, the SEDATAM developers who act as instructors focus mainly on the console functions; the duration of the training is insufficient and it is carried out in situ during the delivery-reception of the equipment, so it does not take place in a proper teaching-learning environment, which allows acquiring the necessary knowledge and training to be able to perform adequately in the Command and Control system of the Navy of Mexico.

This leads us to the conclusion that to achieve Objective 2 of the PSM 2013-2018, "Strengthen institutional operational response capabilities" through strategy 2.3, "Strengthen the Command and Control System", it is necessary to implement a new method that meets the requirements of training and training of personnel participating in the C2 System of the Navy of Mexico.



This Figure shows us through an Ishikawa diagram the leading causes that impact naval operations due to the deficient use of Command and Control systems, grouped according to the different categories of analysis.

In the first category, called Professional Profile, the following causes were grouped together.

- a) Operators in the Operational Units and Naval Commands have very different profiles, which hinders the exchange of tactical information;
- b) The personnel who currently conduct SEDATAM training do not have a teaching profile;
- c) The trainers do not have experience in Command and Control.

In the second category, Doctrine and Procedures C2, the following causes were detected:

- a) there is scarce dissemination of the different doctrinal publications governing the Command and Control of the Mexican Navy; and
- b) there are not enough operating procedures for Command and Control.

Regarding the third category, Training, and Education, the following is observed:

- a) limited training due to the fact that C2 Doctrine and Procedures are not included, the period is not sufficient to adequately assimilate the knowledge, the facilities in which it is carried out (in situ during the delivery-reception of the SEDATAMs) are not designed to carry out training and training, and there are not enough information exchange exercises with other units; and
- b) training is insufficient, mainly due to operational needs. In the fourth and last category of analysis, called SEDATAM Employment in Operations, it is observed that the system is scarcely used in some Naval Units and Commands, mainly due to the lack of knowledge of the functionalities offered by SEDATAM and the shortage of adequately trained operators.

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Conclusions

In accordance with the objectives set for this research, the following conclusions are drawn:

1. The deficient use of the Tactical Data Linkage Systems (SEDATAM) has an unfavorable impact on the Command and Control (C2) of the Mexican Navy, and therefore, on naval operations, because it affects the obtaining of the Common Operational Picture (POC) of the area of operations, the exchange of messages and orders, and especially the Decision Making of the Command.
2. The Personal component of the Command and Control System of the Mexican Navy requires substantial strengthening of its training and qualification in the use of equipment and application of C2 doctrine and procedures in a joint manner.
3. The current Command and Control training process requires adequate infrastructure, teaching personnel and teaching aids for this purpose.

Proposed strategies to strengthen the personal component of C2

Considering the importance of the Command and Control Program for the Mexican Navy, as a preponderant factor to strengthen the institutional operational response capabilities, it is proposed to implement actions aimed at strengthening the training and coaching of the Command and Control System Personnel component in a joint manner.

In the short term, the General Staff, Naval Forces and Regions, and Operational Units should increase the use of SEDATAMs, which should be used whenever they are carrying out operations or following up on them.

In the short term, to increase the dissemination of the Command and Control Doctrine and Procedures among all personnel participating in the C2 System so that it is known, accepted and applied.

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