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Future Command and Control (C2) in Joint Operations: New Potential Concept to be developed in the UAE

By /par …

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Introduction

The command and control function at the operational level is the most important operations function because it ties together the other functions at all levels of war across the range of military operations. Successful command and control is dependent on the commander's judgment, experience, intuition, and leadership abilities.

Command and control (C2) must be examined as separate functions to understand their role and purpose on the future battlefield. The vital components of command, leadership and decision-making are critical centralized activities that, if executed properly, inspire subordinates and instill confidence in them. Control, inextricably linked to command, must be decentralized as a rule in order to retain initiative, flexibility, and the freedom of action our subordinate commanders require to be successful.

This paper argues the importance of Joint Command and Control and how, based on history, theories and experiences, can the new concept be applied to (UAEAF). Its purpose is to examine the command and control function as it applies to the operational commander. Also, the need to establish a combined facility should always be maintained as a possibility since the UAE could be a host nation for future combined operations.

Two decision making process models and command and control design will be covered. In addition, the topics of culture and interoperability will be covered. Finally, we will discuss how can such model be applied to the United Arab Emirates Armed Forces (UAEAF).

This will all be based on the theory as well as the experiences of the joint operations of the Canadian and the American military / personnel.

The History of The United Arab Emirates Military

Under the Name: “Trucial Emirates”, the history of this area, ever since 1820 had been tightly connected with the British presence, so long as it had always been under their protection. Hence, all related security issues in that duration had been in the hands of the British Government military force.

In the very beginning, the British Officers had control of all issues related to command & control. A number of locals received training that enabled them to become capable of actually participating in the aforesaid force. Though it was highly expected that the aforementioned force would pertain the “Trucial Emirates”, the British chose the Name “Trucial Coastal Levies”. After that, the force became known as “Trucial Coastal Scouts”. Then it became famous for “Trucial Coastal Force”.

The first establishment of this force commenced as early as November 5, 1951 and it was composed of a small sixty to a hundred men in city of Sharjah.

Once the British insinuated in the early 60s to the possibility of their withdrawal from the gulf area, each ruler thought about forming a force related to his Emirate. After the British withdrawal in 1971, every Emirate had its own independent force (Abu Dhabi, Dubai, Sharjah and Ras Alkaimah).

The announcement of the UAE Armed Force Unification on the 2nd of December 1971 stationed the UAE people right before their responsibilities in respect of protecting & defending their countries, entity, sovereignty and achievements. The sizable positive spring was to be associated with similar advancement in the form of a small force with light firing capabilities related to each Emirate. The Armed Forces for the UAE as a whole, comprised of all combatant formation and administrative support in order to match its new role while tightly resorting to defensive combating creed relying on the Islamic Doctrines.

The UAE Armed Forces Experience

UAE contributes in UN humanitarian mission as an effective functional member state in this organization, positively and overwhelmingly interacting amidst its

humanitarian issues, while playing a vital role, going in sound conformity with its potentialities in the humanitarian field.

Following are some actual UAE Armed Forces Participations:

- In the framework of Arabian Deterrent Force (ADF) on the 25th of October 1976, the UAEAF participated under the shade of ADF peacekeeping forces in Lebanon targeting the foundation of security & stability established in that country.
- Kuwait Liberation: when Iraq invaded Kuwait, UAEAF was one of the forces to take part in the operation Desert Storm (alliance forces).
- Taking part in the proceedings of 'Restoration Hope' to Somalia. UAEAF sent a Regiment to participate in the peacekeeping, humanitarian relief and establishing security in Somalia within the framework of UN forces. UAE Task force demonstrated its ability while executing the duties entrusted on it. Their task included erecting medical center, erecting distribution stations, drilling wells to make use of underground water, and launching reconnaissance patrol in their area of responsibility.
- Contribution in the Bosnia Herzegovina. The goal was to provide Bosnia with military aid due to assist in solving the Bosnia problem and to render those people their ability of defending the newly established independent State and its sovereignty. The aid was represented in form of weapons presented to the Bosnia army, training a number of Bosnia officer in the UAE, and providing material relief-aid to the suffering Bosnian people.
- Humanitarian contribution in Kosovo. The UAEAF participated in Kosovo peacekeeping mission under the framework of NATO forces. The UAE did not only participate in the peacekeeping mission, but also in providing relief-aid to the deprived Kosovo nation, fixing the Kosovo Water pipeline, road pavement, well-restoration, building textile factory and field hospital.
- Defending Kuwait mission. Due to the current events of March 2003, the UAEAF launched precedence in defending the Kuwait nation within the framework of the Island Shield function, and in sound conformity with the GCC Joint Defense Agreement.

Command and Control as Separate Functions

The command and control function remains a critical, if not one of the most important operational functions as it is the means by which any commander synchronizes activities in time and space, in order to achieve unity of effort. Clearly, Command and Control (C2) ties together the operational functions at all levels of war and echelons of command across the range of military operations.[1]

The US Concept for Future Joint Operations (CFJO) provides a thorough discussion of command and control its close relationship to the operational level of war. It is also identified as the most important function in military operations as it clearly binds the new operational concepts into a single concept enabling the Joint Force Commander (JFC) to conduct decisive operations.[2]

The Command means having the authority and responsibility for using resources effectively to accomplish assigned missions. It is the art of motivating and directing people and organizing into action toward a specific goal. Command requires understanding the current state of friendly and enemy forces, looking to the future force relationships that must exist to accomplish the mission, formulates concepts .of operations to achieve that state and communicates commander's intent and. orders to subordinates, and supervises execution through active leadership.[3]

Ross Pigeau and Carol McCann define “Command and Control” into a model that asserts the following key points: command is the creative expression of human will to accomplish the mission and command capability is defined by combination of competency, authority and responsibility. It also identifies the process on how an effective commander requires a balance between competency, authority and responsibility. As for control, it is the structure and processes that are devised by command to enable it and to manage risk. Thus, control is a tool of command that it should support command competency, authority and res- ponsibility; C2 is the establishment of common intent to achieve coordination. [4]

While command is the art of directing, control regulates forces and functions to execute the commander's intent. Inherent in the exercise of command, control

allows the staff to assist commanders by computing requirements, allocating means, and integrating efforts consistent with the commander's intent and concept of operations. Control serves its purpose if it allows commanders the freedom to operate, delegate authority, and place themselves in the best position to lead, and synchronize actions through out the battle space.[5]

Leadership

The successful future commander must possess the leadership and decision making in order to make timely and accurate decisions, which are then transmitted throughout the chain command for execution. Confident and competent leadership is the most essential dynamic of combat power.[6] Leadership is taking responsibility for decisions, being loyal to subordinates; inspiring and directing assigned forces and resources toward a purposeful end. It is establishing a teamwork climate that engenders success, demonstrates moral and physical courage in the face of adversity, and provides the vision that both focuses and anticipates the future course of events. Evidence of effective leadership is the value-based unit cohesion and functional discipline that ensures teamwork and best efforts toward mission accomplishment. Commanders must ensure their soldiers understand why they are involved in a particular operation and how it is essential to national interests.[7]

A decision-makers should know when and what to decide; these decisions are tactical, operational, and strategical judgments.[8] A commander must anticipate the activities that will be put into motion once a decision is made. In order to make a decision, the Joint Force Command (JFC) or battle commander must understand the higher commander's intent two levels up. He must understand the battle from the perspective of his subordinate commanders and the units adjacent to him. Commanders at the strategic, operational, or tactical levels make different types of decisions. Commanders at all levels provide the intent, the concept, and then allocate the resources and requirements of the operation. Strategic and theater commanders principally allocate the means for subordinate commanders to accomplish the mission. While operational level commanders may allocate means, their primary focus is on committing the available forces into

the battle space. In so doing, the operational level (and higher tactical level commander) set the conditions for decisive outcomes.[9] Ultimately, the commander must determine which decision designated subordinates may make. Typical decisions retained by the commander can be changed in intent or mission based on the operational priorities. In addition, major reallocation of means, and requests to his commander can be added

Information

While information superiority plays a critical role in the future OP, we should understand that information systems are not capable of making decisions; they only provide information so the commander can make informed decisions that impact the command and control function. Assimilating information that is relevant to the operation and accurate in terms of time, space, and forces are critical to timely decision making, therefore, the future commander must be proficient in leadership and decision making.

Most would agree that information superiority has "flattened" organizations and widened a commander's span of control. More emphasis should be placed on intelligent delegation of decision making rather than on increased centralization.[10] With so much information available to the staff and commander, the challenge becomes the mental processing of the information into consistently sound and timely decisions. In other words, "the analysis and decision-making process must be accelerated so leaders at all levels can make the right decisions in a timely manner".

Delegation

Why is delegation so important? In terms of spans of control and time, there are several reasons. First, a decision-maker can only process so much information in a given space of time. Too much time and attention spent on one issue delays attention to other issues. Second tremendous capabilities available to the commander and his staff are not used when too many decisions have to be made. In many cases, they simply don't have the time to absorb and process this

information. Finally the meaning of new and unexpected information is not recognized and therefore, not acted upon. In short, "a belated decision causes a formation to be tied up in ineffective 'marching and counter marching' or precious long range precision fires to be employed ineffectively". [11]

From a different perspective, suppose a commander has information at hand to make decisions for a subordinate level. However, he chooses not to do so because it would increase the number of decisions he would have to make in a given span of time and risk delaying the tempo of operations. Likewise, if the commander attempted to make decisions for all of his subordinate units, his 'span of control' would be so ineffectual that initiative, freedom of action, and flexibility in those units would be lost.

General Was de Czege provides excellent examples of information and decision in his report. He believes commanders understand this concept in theory, but violate it in practice for two reasons. First, the commander becomes fixated on the current engagements of his subordinates and neglects to focus on the decisions, which need to be made at his level, including setting the outcomes for the next operation. Recognizing which decisions are properly his is a matter of command experience. Second, commanders violate this concept because they are instinctively "in charge" people. However, as commanders mature and gain experience, they begin to understand that subordinates will not act freely and decisively when they should if their superior commander interferes and second-guesses their decisions. Mature commanders recognize that they can accept less than perfect solutions by subordinates as long as they make them rapidly and decisively within the context of the essence of their intent, and if they are aware of what their subordinates are doing.[12]

Therefore, staffs work within command intent to direct and control units and - resource allocations to support the commander's desired end-state. Staffs also identify enemy or friendly situations that require command change and ensure the commander is so advised. Tools for implementing command decisions include communications, computers, and intelligence.

In summary, command and control are separate functions. Command is the art

of directing; it involves communicating intent and setting objectives. Control is the science of regulating the effort towards intent and achieving objectives. "Control monitors the status of organizational effectiveness and identifies deviations from set standards and corrects them", while the command function is designed to be more centralized, the control function should be decentralized in order to maximize effectiveness.

Decision Making Process

The two theoretical models provide a framework upon which to organize given a body of knowledge. Models will give better understanding in the C2 field.

The first model is the straightforward Observe-Orient-Decide-Act Loop, better known simply as the OODA Loop.[13] The second model is known variously as the Lawson Cycle or the Lawson-Moose Cycle.[14]

The OODA Loop

Col John Boyd, USAF, Retired, developed the OODA Loop (Figure 1) based largely on his experiences as a Korean War fighter pilot.[15] From his dog-fighting perspective, a fighter pilot must *observe* what is happening, *orient* what he sees with what he already knows and what he wants, *decide* what must be done and then *act* to implement his decision. Once the action has been taken, the loop begins again. Boyd's argument is that whoever operates his own OODA Loop faster and better than his adversary will likely win by causing the enemy to fold "back inside him self so that he cannot cope with events/efforts as they unfold.[16]

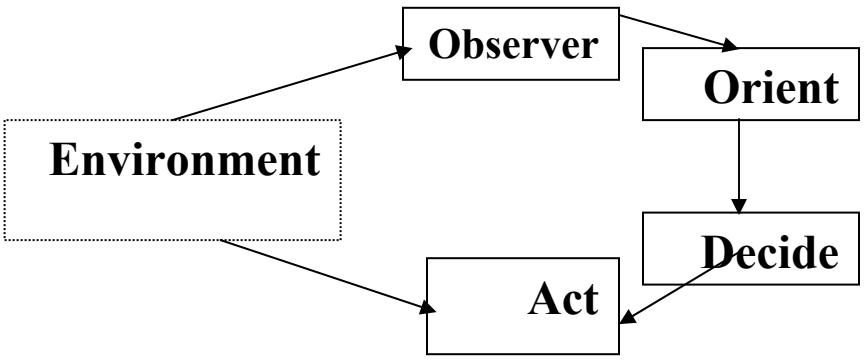

Figure 1. The OODA Loop (From Kenneth C. Allard, *Command, Control and the Common Defense* [New Haven, CT: Yale University Press, 1990], 154.)

This model, which is well known within the military and "operates within the enemy's decision cycle" has become a common phrase and operational objective.[17] But while this model has clear implications for tactical war fighting, it is also a good starting point for a C2 model. As Colonel Boyd wrote:

> *The process of observation-orientation-decision-action represents what take place during the command and control process-which means that the O-O-D-A loop can be thought of as being the C2 (command and control) loop ….Operating inside (the) adversary's O-O-D-A loop means the same thing as operating inside (the) adversary's C2.*[18]

Since much of the loop takes place within the brain of the human, Boyd called it an "organic" process. [19]But this organic process can also be applied to the interactions of complex organizations such as military forces. Leaders and units at all levels will each have their own particular OODA Loop, all of which will be operating simultaneously at slightly different rates. Each loop is constrained by the speed of the loops below it and in turn constrains the speed of the loops hierarchically above it. As with the successful fighter pilot, military forces that operate their C2 cycle faster and more effectively will have a clear advantage.[20]

While the simplicity of the OODA Loop carries great intuitive appeal, using these four blocks to explain all of the C2 activities that occur within a large organization requires "substantial expansion and clarification of the process blocks"[21] Because of this, several other more detailed models have been developed to provide greater clarity and precision. One of these more explicit C2 models is the Lawson-Moose Cycle.

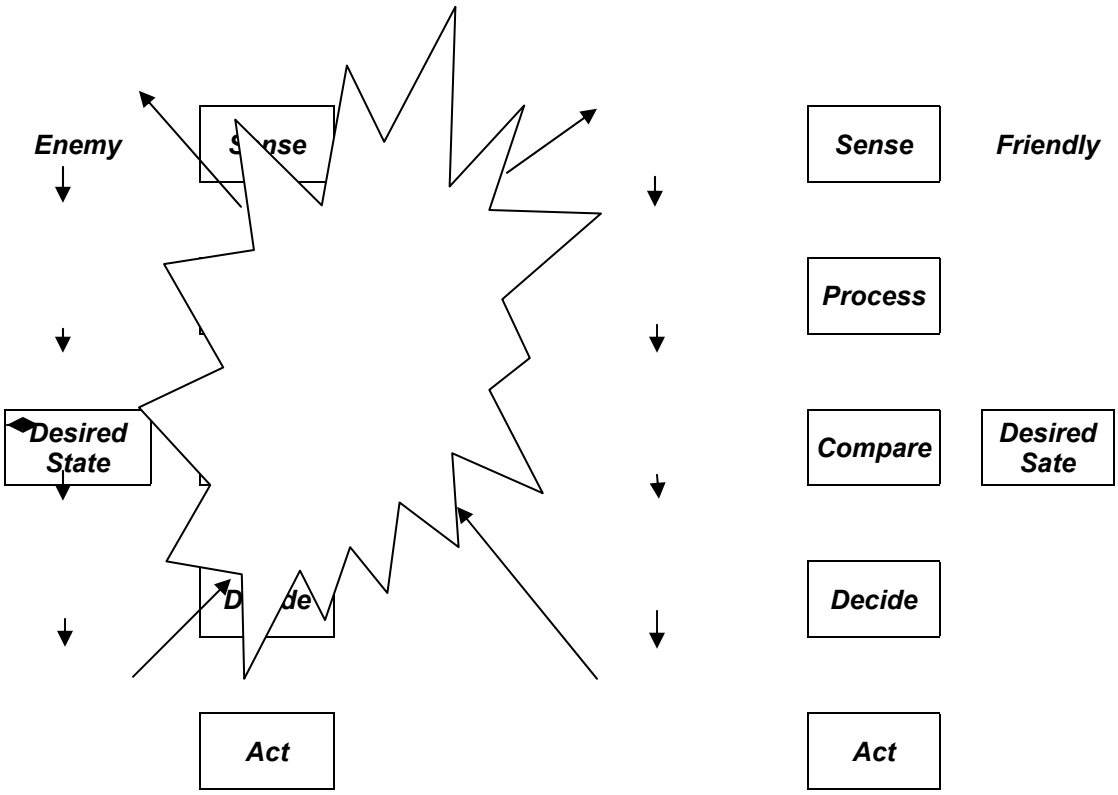

Figure 2: Lawson-Moose Cycle (From CAPT Wayne P. Hughes Jr., USN, Retired Fleet Tactics (Annapolis, MD: Naval Institute Press, 1986), 186.)

The Lawson-Moose Cycle

The Lawson-Moose Cycle (see Figure 2) begins with the notion that "the purpose of the command and control process is to either maintain the surrounding environment or change it".[22] Thus, it introduces several items that make this purpose more explicit.

1. First and most obviously, it shows that there is a matching cycle being

executed by the enemy. This illustrates Clausewitz' point that war is a "duel on a larger scale"[23] and that any C2 actions must be conducted realizing the enemy is also acting to change the environment.

2. Second, the OODA Loop's "observe" block is expanded into "sense" and "process" steps. These more discrete steps become useful as the C2 process moves away from something that happens within a single reign, to a more distributed process that encompasses multiple sensors that produce data that must be turned into actionable knowledge. It is also important to note that there are two general ways to execute the "sense" and "process" steps. First is via the traditional intelligence process. This is the reason the terms "intelligence, surveillance, reconnaissance" are often appended to "command and control." The alternate way is through the "scouting"[24] done directly by combat forces as one of their war fighting functions. "Scouts" gather information and provide it in a less formal manner without much intermediate "processing" since much of the interpretation is often left to the decision maker.

3. The third explicit addition is a "desired state" input that represents the overall objective of the process. The "desired state" block can include such items as the commander's intent, essential tasks, the mission statement, or the operations order.[25] Using this yardstick, the "compare" step (similar to the OODA Loop's "orient" block) examines the current state of the environment against the desired end state.[26] This enables the commander to "decide" on the appropriate courses of action that he believes will change the environment to his advantage. Once the decision is communicated, the "act" step occurs as friendly forces execute their tasks, some change is made to the environment, and the entire cycle starts again.[27]

C2 and Organizational Decisions

Sun Tzu says, "Order *or* disorder depends on organization."[28] So one *of* the commander's key tasks is organizing forces to achieve the *order* needed to accomplish the mission. Organizing includes setting up the structure of a unit, determining whom talks to whom, where information must flow, who may make

what kinds of decisions, and what reports are required.[29]

There are several factors we should look at in order to pick the proper organizational structure:

1. Should a force be organized by area or by function [combat specialty]?
2. Should units be organized by skill or by task?
3. How should forces from different nations be combined?
4. Should forces be organized by medium (air, land, sea, space)?
5. What span of control (broad or narrow) does the commander desire?
6. Will authority be centralized or decentralized?[30]

Obviously, looking through the factors one would have the answers to these questions with a strong influence on the type of C2 processes that are appropriate and the kind of C2 systems that are required. In fact, the association between organizational structure and C2 requirements is strongly linked in a way that every organizational decision is also a C4 systems decision."[31]

Much of the information regarding command and control at any level contains some discussion of whether its execution should be centralized or decentralized. Personally, I would rather choose decentralized control for the simple reason that a commander simply can't control more than a certain number of units at any one time.

The operational commander, in order to effectively command and control he must decentralize execution to the lowest levels possible. Decentralized execution is essential so those subordinate commanders retain the initiative and flexibility they must have to sustain freedom commander balance competing risks and recognizing that loss of immediate control is preferable to inaction. Can operational commanders "command" extremely large organizations? The answer is yes; command is an art in which experience, knowledge, and the ability to communicate effectively are fairly easily shared with many subordinate commanders. However, as previously argued, "control" or more importantly, "span of control" over a large organization should be more limited in order to be effective.

In other words, operational commanders, based on a realistically limited span of control, cannot "control" any more than a certain number of subordinate units at one time. The tendency to over -centralize decisions will limit tempo and the employment of tools (information superiority, battle space awareness, etc) available to the commander. Over-centralization also limits the dynamics of battle command. . Therefore, decentralized control involves staff input and output to assist the commander in executing his intent. With all of the information systems available to the operational commander, he and his staff can provide subordinate level commanders with information critical for effective decentralized operations. Moreover, much of the information can be shared simultaneously, allowing subordinate commanders to conduct parallel planning. Information superiority reduces the need for filtering information from the operational to tactical level. Ideally, subordinate commanders should figure out what information is relevant and how to use it based on sound judgment and commander's intent.

In terms of centralization or decentralization, is it possible to further separate the two so that centralizing one function doesn't necessarily force commanders to centralize the other? The point is to not take for granted the idea that command and control is one function. By definition, one who commands also has the responsibility for and ability to control. Therefore, while the art of command may be clearly a centralized function, the science of control must be reasonably decentralized to the lowest command level, possibly while allowing for an appropriate involvement of higher level commander. Commander and control thus interact to ensure understanding at every level of command.[32]

In particular, the choice between a "centralized, or a very decentralized, polycentric system" will have huge impacts on the C2 approach. This is well-illustrated by the organizational differences between how services drive the types of command arrangements that they pick, which would determine the C2 approaches they feel are most appropriate.

C2 and Culture

One of the main goals of C2 is to promote unity of effort among all elements of a

force. Among the barriers to achieving this are the different Service cultures. Particularly illustrative of this challenge is the case of command and control for air warfare. Given our strong individual Service structure, each Service brings a different perspective to the conduct and control of air warfare that is based on their unique heritage and doctrine. However, as Kenneth Allard wrote, "The downside to this common heritage of service authority is that it is largely an internal mechanism and so, in a sense, stops at the water's edge. Precisely because service command structures exert first claim on the loyalty of their members, command relationships between the services have been a persistent problem."[33] Therefore, the Air Force takes a hard line on centralized control of all airpower by an airman in order to properly prioritize and use scarce theater assets for the overall good. Meanwhile, the Navy believes, based on their experiences, that their organic air assets should not be split from the sea environment or from the combined-arms task force.[34] These built-in differences lead to a number of issues that must be addressed in order to conduct effective and joint air warfare. These include:

1. What unity of command is required to achieve unity of effort?
2. When is unity of command not essential to effective air operations?
3. When is there no need for a single air component commander to control all air assets?
4. When is naval air not needed to protect naval forces or prosecute a naval campaign?
5. When can air units of one service be placed under the control (or even command) of an officer of another service?[35]

James Winnefeld and Dana Johnson examine these issues in detail in their book *Joint Air Operations, Pursuit of Unity in Command and Control,* 1942-1991. This text is on the chief of staff of the Air Force's professional reading list. Chapter Two, "Doctrine and Experience" and Chapter Nine, "Lessons Learned, Relearned and Unlearned" constitute the most essential parts. Using a historical analysis of air operations from WW II (Midway, the Solomons), Korea, Vietnam, Operation El Dorado Canyon and Operation DESERT STORM, Winnefeld and Johnson

evaluate the effectiveness of joint air command and control. Their conclusion includes a set of recommended guidelines upon which to model future joint air operations. In the end, they are optimistic about the ability of the various air arms to have unity in command and control. Nevertheless, they do include a warning about waiting until the fighting begins before starting to think about unity of air effort:[36]

“These airmen, from different services and with different capabilities but bound together by mutual respect, can act as their country's shield. The sacrifices and experiences of their predecessors will teach them that unity grows stronger as one moves closer to the sound of guns, and that in the future the country cannot afford to wait for that sound to achieve that unity”.

If the problems of C2 among Services are bad, then the challenges faced by coalition C2 is even worse. All of the issues inherent in joint C2 are similar to coalition C2. Instead of talking about Service "culture," a commander may have to deal with truly different cultures from a civilization other than his or her own. Communication, and thus effective C2, is made more difficult by “differences in culture, philosophy, religion, ethnic background, and regional ties. This struggle for unity of effort must also play out against a backdrop of language barriers, mostly incompatible equipment and a more sensitive political environment”. [37]

Interoperability and Joint C2 Systems

Of all the considerations in building C2 systems, ensuring interoperability between systems is the very important. More than just "functioning without mutual interference", interoperability involves the capacity of systems to effectively work together to accomplish some functions. This factor is vital because future military operations by definition will be joint and/or coalition operations. Thus the Services cannot afford to have C2 systems that cannot talk with one another. This lesson was learned in the 1st Gulf War. During that conflict, Navy carriers could not receive (and the Air Force could not send) the Air Tasking Order (ATO) via electronic means. While manual workarounds were developed throughout physical delivery of the ATO, efficiency and unity of effort

were hindered by this shortfall. In part because of this problem, recent USDOD directives mandated that "C3I systems for joint and combined operations by U.S. forces must be compatible, interoperable, and integrated, and that **all** C3I systems developed for use by U.S. forces are considered to be for joint use''.[38]

Unfortunately, interoperability is difficult to "add on" after C2 systems are fielded. It is much better to design and build interoperable systems at the beginning of the acquisition process. However, designing and acquiring joint systems presents its own challenges.

A case in point is the development of the US Joint Tactical Information Distribution System (JTIDS). The program had the word 'joint" in its title and had the goal from the beginning of being a joint system. Nevertheless, this primarily Air Force/Navy program was fraught with problems. These were rooted in Service differences, valid technical disagreements, differing operating environment requirements, and fluctuating Service commitment levels.[39]

Despite our interoperability challenges, one of the marvelous aspects of the information revolution is the great leap made in the ability of commanders to see battlefield, know what the enemy is doing, and understand the capabilities of friendly forces. Space surveillance, satellite communications, ubiquitous computers, and advanced software all combine to provide an unprecedented level of information superiority. While this sounds wonderful, there is a real potential for the abuse or misuse of this capability. From the most recent experiences, we have noticed that mistakes still occurred although we have became more technologically advanced. The human factor should continue to play part in the decision making process. Failure of doing so would make us too dependent on technology and increases the chance of miscalculation and making it almost impossible to be in the cross of friendly fire. It has become more usual to get involved in undesirable situation like the friendly fire situation that took place last year between the US army & the Canadian soldiers in Afghanistan.

Future Joint Command and Control of United Arab Emirates Armed Forces

The concept of joint command and control of the United Arab Emirates Armed Forces (UAEAF) is still in the developing stages. The concept has not fully been implemented but there are a many joint operations that have taken place over the past decade. Joint command and control was established for these specific missions. The duration of these joint commands was linked to the duration of the mission.

This paper is considered as a new concept of the joint command and control on the operational level. This is by no means the adoption of concepts and theories of a super power such as the USA. It is simply a different approach that might be more suitable for a country that has smaller armed forces, smaller resources and capabilities. We also have to keep in mind the correlation with the Gulf Co-operation Consul (GCC countries) as well as countries who have treaties with the UAE.

Flexibility

The new structure of the command and control should be designed with flexibility. The reason behind this is to be able to adapt to our own joint operation as well as to the operation within the GCC. In addition, it should adapt to the joint operation of the friendly forces such as France, UK and US. The future is unpredictable, therefore, flexibility is essential in order to meet the future joint command and control challenges and adapt to any new situation that might arise. From past experience, the (UAEAF) was involved in numerous joint missions such as in Lebanon, Somalia, Kosovo, Gulf War etc. Throughout these missions, the command center was concluded when the mission ended. A new concept is being considered where a permanent joint command and control center would be established to assist in any local / internal operation, at a regional level within the GCC or based upon the political demands.

The new concept of the joint command and control organizational structure is based on two divisions: Operational and Support. Each division has their own joint staff. For example, the operational division has J2, J3, J5, J7, J9 and J10.

The Support Division has J1, J4, J6 and J8. The Support Division has its own support in the form of IT / ADM, communication and Security. Both divisions report to a director who in turns report to the Chief of Staff of Joint Force Commander (JFC). The Joint Force Commander is linked to the Interior Ministry, Public Affairs and Liaison Officers from different services.

When we act as a host nation, there is a special combined command and control that coordinates the coalition environment and is linked to the UAEAF joint command and control.

The approach of the human side in the future command and control is somewhat similar to what Brigadier-General G.E. (Joe) Sharpe and Allan D. English PhD have detailed in their book "Principles for Change in the Post-Cold War Command and Control of the Canadian Forces". [40]

After reading their book, I have noticed that we have a lot of similarities in our concepts of establishing a joint command and control.

When it comes to Culture, our armed forces is more open to improve and adapt new ideas and concepts of the joint operations. This is due to the fact that the UAE Armed Forces was established in the early fifties. A drastic approach to upgrade the armed forces began after the 1st Gulf War. The experience acquired during the war coupled with the need to change and adapt to the concept of the joint operation necessitate the move toward modification the new generation of our armed forces.

Challenges will always exist but given the need to move forward and work together, we will find ways to overcome these challenges. In addition, future joint operations will require us to be at the same operational level as GCC countries as well as the potential friendly forces. Failure to maintain an equal standard could have catastrophic results.

People

As for "people first" concept, I am in agreement with the authors where the said "Tapping into the creative potential of the military cadre enhance the CF's ability to effect outcome but also will increase morale among its members".[41]

In today's world, commanders manage people and the outcome of any work is based on the performance of these people. Therefore, having good lines of communication, relationship of understanding between commanding officers and subordinates is extremely important. Looking after the needs i.e. personal need, training, compensation, would be greatly beneficial to everybody. It will ensure continuous satisfaction and will make them more productive.

Training

Commanding in today's world is by far different from what it used to be. As we become more technologically advanced, future C2 should be kept up to date with these advancements. This necessitates that we invest in our commanding officers to ensure that they are competent and able to deal with situations under various conditions. This is accomplished though continuous training throughout all levels of commands.

An effective commander is the one that is successful in combining a balanced approach in leadership through authority, competency and responsibility. Leadership requires authority, as it is a crucial element to accomplishing results.

Morale

A leader must keep high morale by leading by example and demonstrating knowledge of a particular issue. The leader does not have to know all information but must be able to know how to get it quickly and efficiently through the staff and subordinates. Having competent staff is essential in making sound and correct decisions. It is fair to say that in a lot of situations, the leader "makes it or breaks it" through his staff. In addition, caring for troops and being sensitive to their needs is a major responsibility of every leader. A responsible leader can recognize the morale level and know that stress impact all levels of the organization. Taking decisive measures to fix it where needed is very important in a timely manner. The stress can be managed by attending to the needs of the troops, asking them to cope by explaining the reasons for certain situation or through moderators. Basically, the leader, through his balanced approach, must

keep the troops informed of their mission, its intent and purpose. The information must be disseminated in a timely manner.

Control

When it comes to Control, effective commanders must understand its structure and limitation. Proper structures and processes must be in place to enable the commander to make informed decisions. Without such processes, a commander might not be able to make proper decisions. Control, being a tool of command, would make it possible for the commander to assess, understand the situation and to manage the risks.

Research and Development

As in every project, we have to have a clear idea of what are joint command and control, its importance and the reason behind developing such a concept. A research and development department is required to develop new concept of the joint command and control. It should also develop the mission and mandate of the joint C2 that include continuous personal development through training, coaching and mentoring. Various training agendas must be in place for various level of command staring with high ranking officers (from Colonel to General) and continuing with staff officers assigned to joint head quarters (from Captain to Lt. Colonel) and ending with the operators.

Setting up a curriculum would be a part of the R&D responsibility based on the new concept of the joint doctrine. This would be based on previous experiences and lessons learned from past operations coupled with the experiences gained from the friendly forces that have developed such concepts.

Enrolling officers in courses either held locally or abroad in conjunction with our friendly forces. These courses would be an added value to our officers, as they will get extra knowledge in their specific field. In addition, joint exercises with GCC countries and friendly forces would provide our officers with an improved their skills, ability and prepare them to be ready on their own.

There will also be a need for establishing a central training center with several training teams. These training teams would be mobile and they would provide training in the single service head quarter (Army, Navy, Air Force and Air Defense).

In today's rapidly changing we believe that we should become ready to adapt to the new change in the joint C2. This becomes very crucial in order to keep up with different forces that we might be working together in the future. Having superior equipment (advanced army, superior air force and highly technically advance navy) must be joined with competent and well-trained staff. Failure to do so would not enable us to use these capabilities to our advantage in each service.

It is very important to have leaders that can lead and possess the necessary authority, competency and responsibility. Such leaders would improve the staff and soldiers morale and enable them to adapt quickly and conduct their duty in the newly developed system. In addition, such leaders, based on their experience and ability, can improve limitations in the system.

The most important requirement is to invest in our staff, continuously develop them and cater to their needs. Our strength depends on an able, competent and knowledgeable staff. Therefore, continuous learning, improving morale, coaching and mentoring would enable our staff to achieve the pre-set goal.

Conclusion

We have examined the functional the approach of the American and the Canadian definition and explored it to cover the control (structure) and command (personal). We also discussed the leadership in the command style along with the decision making process.

Two models for decision making process were discussed and described through the experiences of the people who designed these models and explained the command and control definition and decision making.

The future command and control design was detailed and clarified; the obstacles that face the joint operation, through the attachment of the single service in their culture, was also presented. I also covered the interoperability and joint command and control from US perspective.

Finally, based on the above and based on what Brigadier-General G.E. (Joe) Sharpe and Allan D. English have detailed in their book “Principles for Change in the Post-Cold War Command and Control of the Canadian Forces”,

the potential joint and command C2 model for the UAE Armed Forces was presented for future concept implementation.

Notes

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