

**ANALYSIS OF THE STRATEGIC AND OPERATIONAL CONCEPTS
CONTAINED IN THE JOINT VISION 2020 OF THE U.S. ARMY AND THE
INFORMATION SUPPORT OF THE JOINT WARFARE**

**АНАЛИЗА НА СТРАТЕГИСКИ И ОПЕРАТИВНИ КОНЦЕПТИ
СОДРЖАНИ ВО ЗДРУЖЕНАТА ВИЗИЈА 2020 (JOINT VISION 2020)
НА АРМИЈАТА НА САД И ИНФОРМАЦИСКАТА ПОДДРШКА НА
ЗДРУЖЕНОТО ВОЈУВАЊЕ**

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ABSTRACT:

Modern warfare challenges impose the need for continuous and necessary transformation of strategic and operational concepts in the application of decisive force, power projection and strategic agility and domination. These challenges continue to govern and manage the overall efforts in the area of transformation of the military factor, resulting from dealing with known and in response to the new challenges in the future. In addition, as a key part in the transformation of the armed forces, and as it is described in the Joint Vision 2020 , “ the expressed possibilities of military forces for dominant maneuver, precision engagement, focused logistics, and full dimensional protection of the forces. “

Modern operations require application of modern communication and information technologies resulting from the rapid technological development and application of new and sophisticated information technologies and means of communication. The usages of these technologies significantly facilitate the management of the military organization, i.e. the planning, organizing, coordinating, commanding, controlling and motivating.

With the new communication systems it is necessary to initiate deployment, receiving messages or to provide primary response to threat. System C4I (Comand, Control, Communication, Computers and Intelligence) means organizations and capabilities, opportunity to communicate securely or publicly, application of standard operating procedures, it automates alarm for monitoring and response to crises, and other services.

Key Words: Command, Control, Communications, Intelligence, Communication and Information Systems (CIS), Electronic Warfare, Immersive Virtual Reality.

INTRODUCTION

Studying the basics of Joint Vision 2020 by the U.S. Army stems from the need to constantly insight and monitor the transformation of the U.S. armed forces, leading economic, political and military state in the world today.

The primary purpose of the armed forces of the U.S. Army, as stated, „is and will be to fight and win the wars in which the present interest of the nation.“ The ultimate goal of the upcoming transformation described in this paper is creating the forces that are dominant across the full spectrum of military operations-persuasive in peace, decisive in war and dominated in all other forms of conflict.

By 2020, as it highlights the American nation will face a wide range of interests, opportunities and challenges that will require the military to win wars, and both contribute to peace. Global interests and responsibilities of the United States is longstanding and there is no indication that would have threatened these interests and the interests of its allies.

Describing these capabilities Joint Vision 2020 provides a vector and a comprehensive program of exercises and experiments carried out by the combat commands and services to meet the need for constant evolution of military force.

The general focus of this vision is providing complete domination by force, in conducting full spectrum operations, develop appropriate doctrine for use of force, organizations, training and education, and utilizing new technologies.

The decision of the military commands of the units at different levels of command, in essence, it comes down to work on the commander and his headquarters in organizing the composition and deployment of the unit, in conducting timely, durable solutions in pursuit of some type of operation.

New systems for information and communication support their implementation in the process of making process which commands are implemented in the units at different levels, which is necessary to initiate the deployment, active application programming packages to help the commander and headquarters in decision timely, high quality and durable decisions that will ensure reliable defeat their opponents.

S4I System (Comand, Control, Comunication, Computers and Intelligance) means organizations and capabilities, the ability to communicate securely or publicly, application of standards, operating procedures, automated alarm monitoring and response to crises and other services.

1. CONTEMPORARY STRATEGIC AND OPERATIONAL CONCEPTS OF WARFARE THROUGH THE PRISM OF THE JOINT VISION 2020 OF THE U.S. ARMY

Joint Vision 2020 is based on fundamental views contained in the previous Joint Vision 2010 emphasizing the need for constant and continuous transformation of the U.S. armed forces. Primary goal of these forces, as it is emphasized, "is and will be to fight and win the wars which represent the interest of the nation." The ultimate goal of the transformation described in this paper is in creating, making forces that are dominant across the full spectrum of military operations - persuasive in peace, decisive in war and dominant in all other forms of conflict. By 2020, as it is emphasized, American nation will face a wider range of interests, opportunities and challenges that will require the military to win the wars, but at the same time to contribute to the peace. Global interests and responsibilities of the United States are longstanding and there is no indication that would threaten these interests and the interests of their allies. The strategic concepts of decisive force, power projection, overseas presence, and strategic agility will continue to govern and manage the overall efforts for fulfilling the obligations deriving from facing the new challenges in the future. This vision describes the ongoing transformations of these new capabilities. As explained in Joint Vision 2020, the expressed opportunities for dominant maneuver, precise engagement, focused logistics, and full dimensional protection of the forces (Scheme 1), as it was actually the case with the Joint Vision 2010, are planetary in by its nature and are keeping its significance further on ".³³

<?> http://www.fs.fed.us/fire/doctrine/genesis_and_evolution/source_materials/joint_vision_2020.pdf
(visited on 09.03.2014)



Figure1. New operating concept of dominant maneuver, precise engagement, focused logistics, and full protection of the troops

(Source: Joint Vision 2020, America's Military: Preparing for Tomorrow)

STRATEGIC CONTEXT

As it is stated in the Joint vision 2020, there are three aspects of the world till 2020 that would have significant implications for the U.S. armed forces. First, the U.S. will continue to have global interests and will be engaged with various regional actors. Transport, communications and information technology will continue to develop and promote expanded economic ties and awareness of international events.

Second, it highlights the state of the real capabilities of potential adversaries who will have access to the global commercial and industrial base and with the same technology as the one of the U.S. military. The increased availability of commercial satellites, digital communications and public Internet of the opponents must be denied by the advantage of the quality of trained personnel, implementation of doctrine, organization and training that will enable to achieve combat effectiveness.

Third, it should be expected, potential adversaries to adapt as the capabilities to respond by engaging in military force will grow. Therefore, it is necessary to continually

develop superior conventional fighting capabilities, backed by effective nuclear deterrence, which is important to point out that this military balance is not static. Asymmetric methods and goals of the opposition often are far more important than the relative technological imbalance and psychological impact of the attack which may exceed the actual physical damage that is caused. The adversary can achieve an asymmetric advantage of tactical, operational or strategic level by identifying, recognizing key weaknesses and to devise concepts for asymmetric attack and use them.

FULL DOMINANCE

For allied forces engaged in the joint warfare, in the future, this goal will be achieved only through complete dominance - ability of the U.S. forces, or in combination with the multinational and inter agency's partners who will be able to defeat any adversary and to establish control over each situation across the full range of military operations. The full range of operations includes maintaining strategic deterrence. It involves in conflict to use strategic forces and weapons of mass destruction, big wars, regional conflicts and small unforeseen conflicts. Achieving complete dominance means that the allied forces will fulfill the primary goal - win the war and achieving success across the spectrum of operations, which should take into account losses or difficulties in engaging forces.

INNOVATION

Joint Vision 2020 identifies the technological innovation as a vital component in the transformation of joint forces. Innovations are primarily concerning the news in integrating doctrines, tactics, training, support operations and technology for the new operational capabilities. Effective innovative process requires continuous learning - this means exchange and interaction which assess, evaluate the achievable goals, operational lessons, exercises, experiments and simulations, as well as inclusion of feedback mechanisms. Services and commands must allow the highly trained and skilled professionals to create new concepts and ideas that may lead to future breakthroughs. However, experimental process with a low error tolerance makes the forces to identify and nurture the most important and most productive aspects of the new concepts, skills, capabilities and technologies. That is the reason why there is a high level of uncertainty and difference in the quest for innovation. Leaders must assess the effectiveness of new ideas, potential movements to new concepts, capabilities, opportunities of the potential adversaries, the cost versus benefits of the new

technologies and the organizational consequences of emerging capabilities. They need to put these estimates in context of the developing analysis of the economic, political and technological factors of the anticipated security environment. Each of these estimates will be uncertainly associated with them. But the best innovations often come from people who make decisions and achieve success regardless of the uncertainties and the limited information. Although the change in technology represents the primary carrier of environmental change, it is not the only premise in the changes which appear in the modern warfare. The search for innovation must entail the entire context of the joint, joint operations which means that the armed forces have to explore, to seek for changes in the doctrine, organization, training, leadership and education, personnel and facilities as well as and primarily in the military and applied technology.

INTEROPERABILITY

Interoperability is the foundation of effective, joint, multinational and inter- operation efforts. Allied forces need to make significant progress towards achieving the optimal level of interoperability, particularly in terms of continuing improvements. Such improvements will include refinement of joint doctrine and further development of joint technologies and processes. The exercises, personal exchanges, agreements for standard operating procedures, individual training and education and further planning will only increase and institutionalize these capabilities. Interoperability is a mandate for the Joint Force in 2020 particularly in the area of communications, common logistics and commitments, particularly in the area of information sharing. Although technological interoperability is important, it is not sufficient to ensure effective operations. It should have a convenient focus of procedural and organizational elements, while the decision makers at all levels must understand each other's capabilities and limitations. Training, education, experience and exercises, joint planning and skillful communications at all levels of engagement of Joint forces will not only overcome the barriers of organizational culture and different approaches but will teach the members of the joint teams to appreciate the full range of service, officials capabilities and opportunities available to them. Future joint forces will have embedded technologies and adaptable organizational structures that will allow trained and experienced people to develop appropriate processes and procedures, to engage in the associated planning necessary to adapt to the new specific crisis situations. These features are not only important for the allied forces, but also for multinational operations and inter -agency operations

INFORMATION SUPERIORITY

Information, processing the information and communications networks are the foundation of every military activity. Throughout history, military leaders have regarded information superiority as the key to victory. However, the current information revolution creates not only a quantitative but also a qualitative change in the information environment that will result in profound changes in the execution of military operations. Actually, the advancement in information capabilities are very fast, so there is a risk of exceeding the capacity in terms of new ideas, formulating new operational concepts and qualitative development in capacities to assess the results. The word superiority suggests the state imbalance in one's favor. Allied forces must be able to take advantage of the superior information converted to superior knowledge to achieve superiority in decisions i.e. better decisions are made and implemented faster than an opponent can react, or in non-combat situation, as a pace that allows the power to shape, form or to react to changes and successfully complete the mission. Superiority in deciding doesn't automatically result from the information superiority. Organizational and doctrinal adaptations, quality training and experience and the actual mechanisms and tools in command and control are also necessary. Development of information technology will allow including traditional forms of information operations with all sources of sophisticated intelligence, control and performing fully synchronized information campaign. Development of the concept that marks the global information network will provide a network-oriented environment required to meet this goal. The network will be globally connected, collection of information capabilities, associated processes and people that manage and provide information at the request of the parties of the war, policymakers and support personnel. It will increase the combined power and contribute to the success of military operations. Realization of the full potential of these changes requires not only technological improvements, but also permanent development of organizations and the doctrine as well as maintaining an advantage in information environment. Information superiority is basis for transformation of the operational capabilities of the joint forces. Allied forces from 2020 will use superior information and knowledge thus achieving superiority in decision making, will support the advanced command and control capabilities and will achieve the full potential of dominant maneuver, precise engagement, full dimensional protection, and focused logistics. The breadth and pace of this evolution requires flexibility and willingness in the application of innovations in all areas of technology and the applied environment in the society.

Information superiority in engagement of military forces is crucial in supporting the

military decision-making process, thus providing maximum effectuation of its operational capabilities and opportunities.

2. MEANING AND USE OF INFORMATION SUPPORT OF THE MILITARY DECISION MAKING

Decision making process of the military commands of units at different levels of command, basically is the work of the commander and his headquarters in organizing and deploying the composition of the unit, in conducting timely, durable, comprehensive solutions in pursuit of a certain type of operation. The process of military decision making is continuous and flexible working method, which begins with receipt of the mission, followed by analysis of the mission, alternatives of action and ends with making acceptable and approved plan of action that is assigned to a military unit in a form of an operational command.

During the phase of analysing the task and the assessment of the situation all influential factors that can contribute to the successful execution of the mission are studied. Information technology as a tool to support is applied in intelligence preparation of the battlefield, or the analysis of the effects and impact over: the terrain, infrastructure, weather conditions, demographic factors, opportunities to move units, opportunities for fire support, opportunities for supply, communication opportunities and similar. Moreover, such analyzes and estimates of the impacts and opportunities of using information technology can be performed on the two opposing sides, i.e. the enemy and friendly (own) forces. The results of these analyzes can be visually displayed by using animations of digital maps, or graphical and tabular signs/indicators, which facilitates the work of the staff in the next stages of the work, i.e. the generation of possible options for action and their analysis and comparison.

Application of information technology as a tool for support is suitable to be used for analysis of the relative ratio of the combat capabilities of the adversary parties, as well as to determine the weaknesses and the degree of vulnerability on the side of the enemy.

During the phase of generating possible options for action, and on the basis of each version a simulation scenario is created. Then it is normally to consider at least two variants based on the assumed effect of the opponent. Such suppositions of the effect of the opposing party are used for simulation testing of the suitability and feasibility of the suppositions about the effect of its strength during the phase of generating possible options for action and their analysis and comparison. By using simulation the activities and results from the action of each of the formational units and other elements of the operating schedule or operating order

are being analyzed. The opportunities offered by information technology entail performing simulation during hostilities faster than the real time, dramatically reduce the time required to perform such analyzes and raise the quality of the same. After performing the simulation for each of the proposed options for action, each headquarters' officer analyzes the advantages and disadvantages of individual variants from his perspective and related to the department involved.

Finally, in the phase of drafting the order and developing the combat documents by using information technology as a support, and based on various scenarios previously generated by different variants for the use of force, many of these combat documents can be made in a very short time by using databases that were previously used.

In modern armies today, lot of efforts are invested into the integration of information technology within the system that includes staff work, communications and intelligence and their use in real- time. The use of information technology in this way can help more efficient decision- making in the process of operations planning, or for better integration of information to understand the situation and generate various proposals for engagement of forces in carrying out combat actions.

C4I- SYSTEM TO SUPORT THE MILITARY DECISION MAKING PROCES

The systems for support when making decisions are computer tools designed to support decision making, serve to assist the Staff in making the best possible decision. They are in many respects innovative because often are designed with the capability of artificial intelligence (typically using thousands of complex algorithms), and can process large amounts of data in a very short period of time, and their design often promotes different levels of interaction which is determined by the user. Depending on the design of the system for support the decision making at various levels of automation it can greatly facilitate the task of the project and decision making.

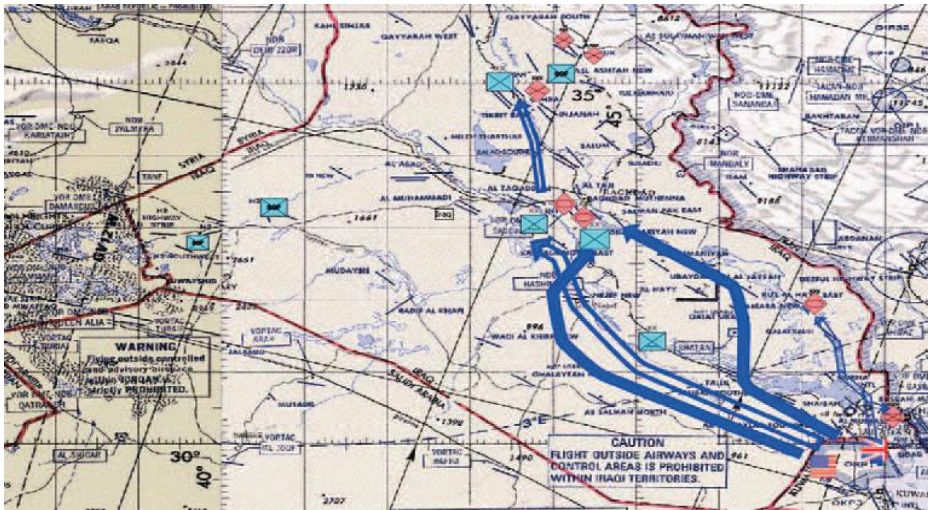


Figure 2. Display of map with an example of displayed Armed forces (own & enemy)

C4I is a digital, command, control, communications, computer and intelligence system. This system includes a mix of fixed, semi - fixed and mobile networks and presents an integrated package that allows the Staffs to receive automatic review of the activities of the friendly forces, movement of the supplies, planned fires, review of the situation, intelligence reports, overview of the airspace and weather reports. This system by providing real information greatly accelerates the process of decision making. This system combines seven packages in a single system:

- System of Control of maneuver
- System for air and missile defense
- Combat service support System,
- Analysis of all sources System
- Artillery Tactical Data System,
- Tactical Integration Airspace System
- System for Tracking of its strength.

The following text will do a brief analysis of the above information systems without which the military decision making process and management of military force in modern conditions of warfare would be simply impossible.

MANEUVER CONTROL SYSTEM -MCS

The system to control maneuver is an integrated system consisting of hardware, software, standardized integrated command systems, personnel and procedures. It is supported by tools for graphical support of the decision which include digital maps, areal or satellite photos, dynamic three-dimensional view of the battlefield and analysis of the mobility of the terrain and overviews of security with maps of battlefield preparation as well as resources needed by the unit during a battle. During the mission, the system provides automatic updating of friendly / enemy unit movements. To simplify its operation, the system uses commercial office applications to generate reports, and display images, tables and graphs. The system for control and maneuver of the commandant and its headquarters provides a realistic picture of the tactical battlefield. The aim is to establish a basic level of capability to the commander and his forces to become more lethal and more durable.

Through this system, the commander and his headquarters can transmit critical information on the battlefield, such as information related to the mission: varieties of activities, schemes of maneuver, warning and operational orders, changes of priorities and intelligence, fire support, the status of Material and Technical Assets and requirements for air operations. The Control system helps the maneuver commander in the application of combat power at the appropriate time and the appropriate place in response to the great dynamics of the battlefield, which allows the commander to have sufficient flexibility and to act preventively on the development of a complex situation.

COMBAT SERVICE SUPPORT SYSTEM-CSSS

The system for combat service provides support for decision-making aspect of logistics support for the armed forces in peacetime and wartime. It provides Microsoft tools to display the logistical capabilities. It offers a modular, tabular and graphic display in real time with tendency in the near future to meet the full range of logistical requirements of the battlefield.

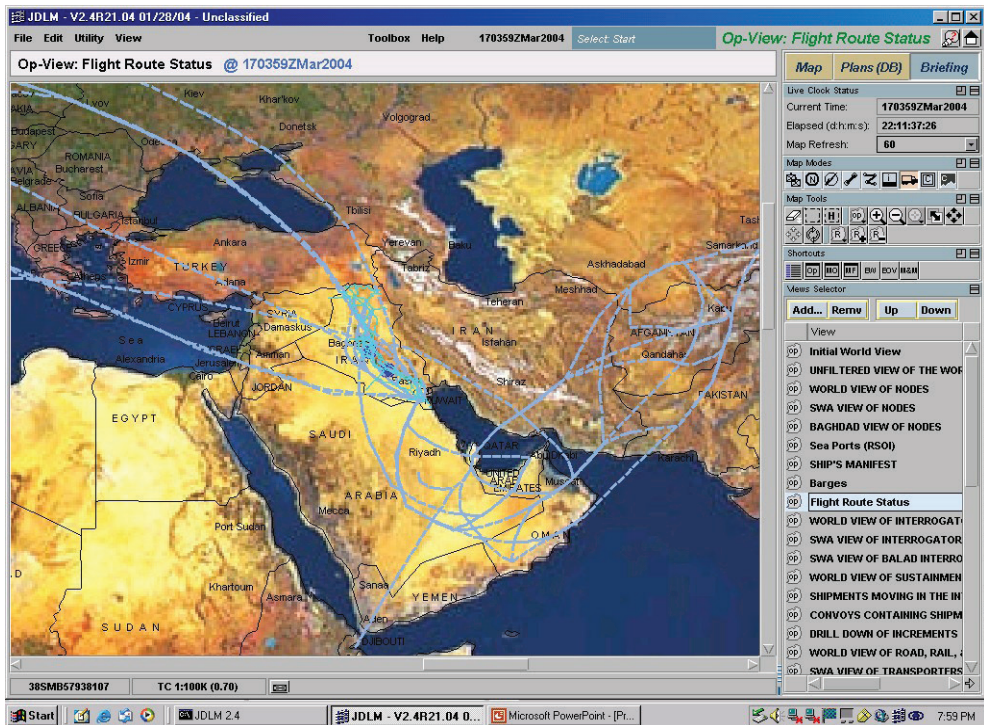


Figure 3. Combat Service Support System

The system supports training, mission planning, exercises, and performing the all work with one tool in unclassified and classified environments, thus providing analysis to support the process of decision making tools that allows commanders to make careful decisions quickly and effectively to execute the mission.

AIR AND MISSILE DEFENSE SYSTEM - AMDS

The System for Air and Missile Defense provides joint planning of the airdefence and missile defense planning personnel and represents a tool for presentation of the situation of the air defense at all levels of command. It is airdefence and missile defence component and provides a common airdefence and missile-defence tool for operational planning of the commanders of air defence at all echelons of command, and automatic planning of air defence and defense capability of the deployed units.

ANALYSIS OF ALL-SOURCE SYSTEM- SASSI

The system is a program for automated processing and analysis of intelligence from all sources and can be used on a tactical level so their deployment ranges from level of a corps to the battalion level. Intelligence provided by the system for analysis of all sources enables commanders and their staffs to identify key points for dominant maneuver and retrieval of high priority targets for precise targeting of the actions against them.

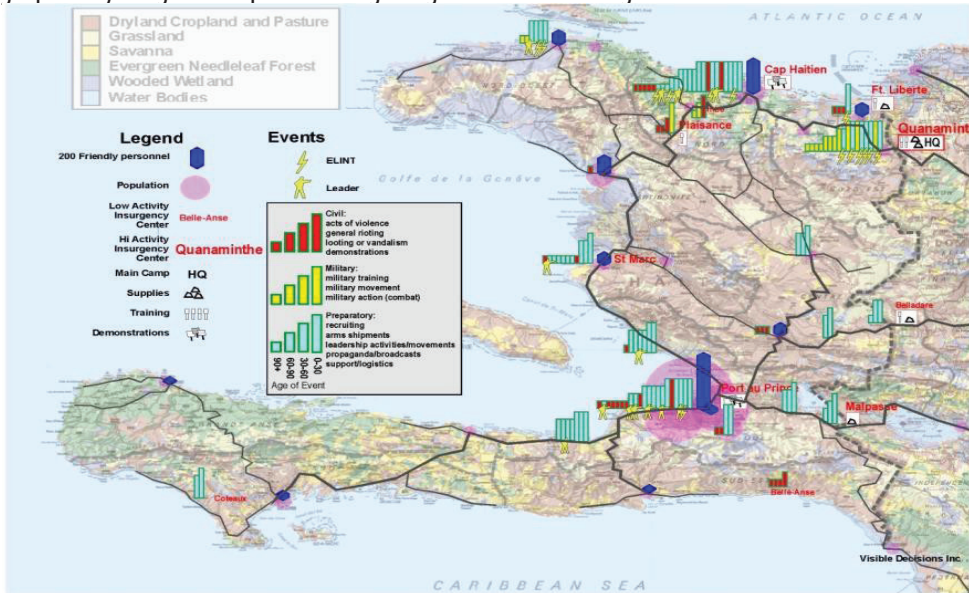


Figure 4. System for Analysis of all Sources

The System for analysis of all sources can analyze all incidents and assists in determining the pattern and methods of use of improvised explosive devices related incidents. With the help of this system commanders and their personnel can identify the exact locations that are typical for conducting shell attacks, so that they will have the opportunity to warn the troops of the existence of such a threat. Of course this is just a problem about which we can get solution from this system.

ARTILLERY TACTICAL DATA SYSTEM-ATDS

Artilerisko tactical data system serves for planning and execution of fire support during each phase of combat actions, whether it relates to support of offensive or defensive combat actions. In this case computer technology and network connectivity has been used

to support the Staffs when solving problems and making military decisions. This system provides complete flexibility in managing combat actions on previously planned and time-limited purposes. Provides fully automated support for planning, coordinating, controlling, and executing fire support and effects.

TACTICAL AIRSPACE INTEGRATION SYSTEM -TAIS

Tactical Airspace Integration System is material solution for integration and synchronization of the airspace and control of the air traffic within the command system of the land forces. As part of the automated command system of the land forces provides airspace management and execution of air traffic services.

This system allows commanders to act against the enemy from very large distances but with very high precision.

MONITORING SYSTEM OF OWN (INTERNAL) STRENGTH-MSIS (C2PC)

The system for monitoring own(internal) strengths provides software and hardware tools that support the commander and his headquarters, and in almost real time offers situational picture of the units from brigade level to the level of a soldier. The system can integrate over 1,000 participants and can cover the entire area of interest of the brigade, including combat vehicles, armored personnel carriers, infantry combat vehicles, tanks, helicopters, artillery and other combat and support elements.³⁴

The coverage of the system extends far beyond the line of visual communications. The system relies on sophisticated communications devices that integrate positional navigation and the ability to inform. There is also identification capability on the battlefield (such as monitoring of its strengths during the performance of hostilities).

The monitoring system of its own units has penetrated as a separate part - particularly in the army, base stations are also placed for monitoring units throughout the territory of Republic of Macedonia and it is operational too. In addition, this system is embedded in the Army APCs located in Kabul - Afghanistan and they are involved in a global monitoring system of own strengths via which from the operational Center of the Macedonian contingent in the main command in Kabul all armored transporters that are performing a particular task can be monitored.

34 <http://www.northropgrumman.com/capabilities/c2pc/Pages/default.aspx> (visited on 20.04.2014)

CONCLUSION

Joint Vision 2020 stems from perceptions and future prospect and positioning and expressed needs of the military forces for dominant maneuver, precise engagement, focused logistics and full dimension of force protection in the field of warfare.

C4I (command / control / comms / computer / intel) means substantial nature of communications in the emerging fields of sophisticated engagement whose primary purpose is to provide greater security and quick response as well as ultimate interoperability. The success of joint and combined military operations will depend on the rapid exchange of information within a dynamic and highly mobile battlefield and the future operations will be conducted in the new hyper - linked digital world so that commanders will have to know the exact positions of all friendly and hostile forces, if they are to reach the goal.

Therefore, it is necessary to implement modern communication and information systems in the Army of Republic of Macedonia, which directly will affect the changes to the traditional decision making way. On the other hand, this will dramatically increase the need for information and its acquisition in real time, will affect the size of commands and Staffs, as well as the condition/state and structure of the armed forces, in order to ensure generation of rapid, correct and enforceable decisions.

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