THE ASSISTANT SECRETARY OF THE NAVY
(RESEARCH, DEVELOPMENT AND ACQUISITION)
1000 NAVY PENTAGON
WASHINGTON DC 20350-1000

JAN 11 2018

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Department of the Navy Unmanned Systems Goals

The United States Navy and Marine Corps have a strategic imperative to exploit emergent and rapidly developing unmanned and autonomous technologies. In order to accelerate the development and fielding of unmanned systems and to ensure an integrated and efficient effort, the Department of the Navy (DON) has established aggressive goals for the acceleration of the DON's unmanned systems and to ensure the DON remains at the forefront of these emergent operational capabilities.

Attachment (1) presents the goals designed to accelerate the development and fielding of unmanned systems in the DON.

James F. Geurts

Attachment:
(1) Department of the Navy Unmanned Systems (UxS) Goals

Distribution:
USN
ASNs
OGC
CNO
CMC
DUSNs
DASNs
AUDGEN
CHINFO
CNR
DMCS
DNS
DONAA
DONCIO
DON SAPRO
JAG
NAVIG
NCIS
OIG
OLA
OSBP

Department of the Navy
Unmanned Systems (UxS) Goals

UxS Vision: Decisive, Deliberate, and Dominant
Manned/Unmanned Naval Forces

Unmanned and autonomous technologies are transforming the way countries conduct military operations making an already challenging security environment exponentially more complicated. Over the near term, that rate of technological change will present both challenges and opportunities for allies and adversaries alike. In the long term, the use of unmanned and autonomous systems will change the way we fight. The United States Navy and Marine Corps have a strategic imperative to exploit emergent and rapidly developing unmanned and autonomous technologies, while building a solid infrastructure upon which our future forces will be based, to ensure our continued warfighting superiority.

Unmanned Systems Vision

The Department of the Navy (DON) Unmanned Systems (UxS) Goals support a vision for how the United States Navy and Marine Corps will progress toward a seamlessly integrated manned/unmanned future force. In the near term, the DON will integrate unmanned systems into our operational forces across all domains in order to enhance the full range of naval operations. This will allow our Commanders to rapidly employ emergent, disruptive and technically superior unmanned and autonomous capabilities. These enhanced capabilities will drive our advancement in human-machine teaming by incorporating unique and disruptive elements that only unmanned and autonomous systems can provide. Complete unmanned and autonomous force packages will become a viable first response option for operational Commanders. In the mid-term, the infrastructure and systems required to support these emergent capabilities will be realized across the Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel and Facilities (DOTMLPF) spectrum. Unmanned Systems will:

- ...operate in every domain
- ...always be an option
- ...be at their best when teamed with Marines and Sailors

Unmanned Strategy and Plans

The DON will establish and maintain a comprehensive unmanned systems portfolio. This portfolio and perspective on unmanned systems will account for all of the Department's unmanned efforts and provide a foundation for the development of the DON's Unmanned Systems Roadmap. The roadmap will identify the gaps and future capabilities to align the Department's unmanned systems efforts in the attainment of the unmanned systems goals.

Unmanned Systems Goals

In order to realize this unmanned systems vision, the following goals are established:

- *Achieve Air superiority through an integrated team of manned, unmanned and autonomous capabilities.* Develop the Family of Systems (FoS) that best blends air and autonomous capabilities, desired warfighting effect, performance, and affordability. Elements of this air superiority FoS will team with and may, in some cases, replace manned aircraft. This will result in a FoS capable of intelligence, surveillance, and reconnaissance, air warfare, airborne electronic attack, and strike. This FoS will employ network-enabled sensors and weapons that allow for a persistent and seamless transition of missions across the phases of conflict.

- *Achieve Undersea superiority by expanding the global reach of our undersea constellation.* Develop a family of unmanned undersea systems and vehicles capable of delivering effects and deploying autonomous systems into all domains as an element of a persistent and sustained undersea constellation. In this regard, the family of unmanned undersea systems will have operational agility and versatility from beneath the surface, increasing operational persistence and enabling clandestine combat reach from under the sea to achieve maritime, air and land objectives far forward.

- *Achieve Surface superiority through an integrated team of manned and unmanned autonomous capabilities.* Develop platform independent and force multiplying unmanned surface systems that significantly increase the standoff, reach, and protection of our manned platforms. These unmanned surface systems will be employed individually, deployed as surrogates and teamed with manned platforms to achieve surface dominance.

- *Assimilate our future Ground fighting force.* Develop platform independent and force multiplying unmanned ground warfighting systems that significantly increase the standoff, reach and protection of our manned platforms in order to execute force projection, security and peacekeeping operations. These unmanned ground systems will be employed individually, deployed as surrogates for our manned platforms, or teamed with manned platforms to achieve ground objectives.

- *Field multi-domain capable unmanned and autonomous systems.* Develop a family of multi-domain, hybrid and agile unmanned systems. These systems will be able to seamlessly transition from one domain to another and exploit the tactical benefits presented by operating cross domain.

- *Achieve unmanned mass.* Develop concepts and doctrine for the employment of massed unmanned assets providing Commanders the ability to overwhelm, confuse, distract and

disorient adversaries through concepts such as swarming, dispersion, surprise, and decoy. Concepts and doctrine must consider employment, resupply, retrieval, and sustainment.

- *Achieve persistent supply, support and sustainment by integrating unmanned and autonomous systems.* Employ unmanned systems as a means to provide effective and efficient logistics support. This will include platforms, payloads, sensors, information systems and infrastructure for readiness reporting and forecasting, supply, and maintenance diagnostics capable of supporting operations in hostile and denied environments.

- *Achieve full unmanned operational capability with advanced autonomy and machine learning.* Unmanned Systems will be increasingly autonomous. Develop advanced autonomy for unmanned systems which will allow for new warfighting concepts of human-machine collaboration and optimize/aid human decision making within the context of operational execution, planning, and support. Advanced autonomy will enable continuity of operations in contested environments where command and control networks are unavailable. Capabilities will be extended to non-lethal applications and counter-unmanned systems.

Near-Term Enablers and Shaping Efforts

- The DON will continue to conduct a series of annual multi-domain fleet exercises that will include the integration and teaming of manned/unmanned and autonomous systems across all domains including live, virtual and constructive environments. These exercises will improve our understanding of the capabilities and limitations of manned/unmanned and autonomous teamed operations. These insights will inform and shape our investments and resourcing, enhance the development of future naval capabilities, and impact the future of Navy and Marine Corps operations.

- The DON will resource and execute a prototyping and experimentation strategy to explore technology solutions and to inform the advancement of tactics, techniques and procedures for unmanned systems and the teaming of manned and unmanned forces.

- The DON will conduct a comprehensive review of acquisition directives, instructions, policies, processes and practices in order to streamline the development, delivery and sustainment of unmanned systems in our Fleet and standardize the consideration of unmanned systems in all Analysis of Alternatives (AoAs).

- The DON will assess, formulate and develop plans to mature technology, standards, and open architectures for unmanned and autonomous systems across the full range of operations. Hardware, software, data, command and control interfaces and networks must be developed to ensure our unmanned and autonomous systems remain operationally effective, cyber-resilient and fully interoperable.

- The DON will assess current policies, revise existing or develop new policies to address the human element of achieving effective human/machine teaming. Policies must be developed to address issues such as personnel policies, manning requirements and training pipelines, achieving trust in the human-machine relationship, and developing comprehensive rules of engagement for unmanned systems based on evolving ethical and legal frameworks. The DON must fully understand the lifecycle implications of increasing autonomy across the DOTMLPF spectrum.
- The DON will develop testing strategies and environments that consider the unique requirements of verification, validation and accreditation for unmanned and autonomous systems to keep pace with the insertion of technology. The DON will embrace the use of prototyping, modeling and simulation, and live, virtual and constructive development environments to supplement traditional development and operational testing frameworks.
- Long duration and persistent unmanned systems will require a greater understanding of the operational environment and the storage and replenishment of energy systems. This will necessitate targeted efforts to develop and accredit higher fidelity models for mission planning and execution as well as advancement of energy storage and delivery to our unmanned systems.

Unmanned platforms have significantly enhanced the effectiveness of our naval forces. In the future, when employed in combination with manned platforms in cross domain applications, unmanned systems will begin to realize their potential. This combination will provide capabilities that far exceed the effectiveness of systems or platforms employed in isolation.

Increased operational use of unmanned and autonomous systems promises to unleash a revolutionary capability for our naval forces. Tapping into the imagination and creativity of our Sailors and Marines will accelerate the introduction and teaming of unmanned systems, and is in keeping with United States Navy and Marine Corps' long history of early adoption and innovation. An operationally effective mixture of manned, unmanned and autonomous systems will be an essential element of forging our future naval forces.