1. Background. System of System testing is often complicated by the lack of succinct implementation of requirements on systems, and by the inability to verify specific functionality within systems that are required to achieve interoperability. Knowledge of implementation, functionality or security deficiencies in systems does nothing to mitigate them if the problem is inherent to the development process.

2. Modern Software Testing. As described in the reference, Unit Testing is used to extend test procedures across the development process and even into the operational realm. Modern software development processes include continuous testing which is applied at the lowest possible level of detail. Because these tests represent authoritative expressions of required functionality, they can be re-used in multiple software projects.

3. Test Repository. The development, validation and distribution of authoritative software unit tests requires a combination of operational and technical knowledge which is inherent to MCTSSA. As a key player of the Marine Corps Systems Command Developmental Testing efforts MCTSSA has an opportunity to focus efforts on the development of re-usable Unit Tests which acquisitions programs can provide to their development activities in order to ensure compliance. These test can then be incorporated into end to end testing as part of the acquisitions process.

4. Recommendation: MCTSSA expand and modernize its testing role in the Marine Corps to include subject matter expertise and authoritative resource for Unit Testing in order to accommodate increasing complexity and security requirements in C2 systems.

4. Courses of Action.

#1: INITIATIVE: State the intent to become the Authoritative Data Source (ADS) for automated Unit Tests in the Marine Corps. Conduct research on all current efforts in the Marine Corps and DoD, and hire experienced professionals to lead the effort.

#2: PROOF OF CONCEPT: Using existing testing data, compile a list of specific software functions that can be considered as critical requirements for basic functionality and interoperability independently of specific system or program requirements. Use this list to generate Unit Tests and apply them to existing systems for which all source code is available. Publish these unit tests as a reusable resource and implement a process for expansion and maintenance.

#3: CLEARINGHOUSE: Collect all existing Unit Tests from all known programs which implement Unit Testing. Apply these tests to systems for which all source code is available. Publish these unit tests as a reusable resource and implement a process for expansion and maintenance.