Complete the following SEMP sections for: **The DARPA Urban Challenge – See Canvas/Course Documents – Or other Project**

# Technical Management Processes

## Configuration Management

Configuration Management (CM) within A&Bs scope consists of:

* Identification and involvement of relevant stakeholders
* Setting of CM goals and expected outcomes
* Identification and description of CM tasks
* Assignment of responsibility and authority for performing the CM process tasks
* Establishment of procedures for monitoring and control of the CM process
* Measurement and assessment of the CM process effectiveness

At a minimum, A&B identifies the following tasks as necessary:

* Identifying the configuration of selected work products that compose the baselines at given points in time
* Controlling changes to configuration items
* Building or providing specifications to build work products from the configuration management system
* Maintaining the integrity of baselines
* Providing accurate status and current configuration data to developers, end users, and customers
  + 1. Baseline Definition and Management
       1. Configuration Identification

Within A&Bs context and culture, it must adhere to or incorporate applicable policies, procedures, and standards to accommodate acquisition and subcontractor situations. Throughout the process, configuration items will be managed and controlled. Steps involved include establishing a procedure for labeling items and their version to provide a context for each item within the system configuration and to show the relationship between system items.

* + - 1. Configuration Status Accounting

Configuration Status Accounting calls for establishing baselines, changing control, configuration auditing, establishing constraints and guidance, accounting for organizational issues, and measuring with proper tools.

Establishing baselines means assembling configuration items in a way that specifies how a system will be viewed for the purposes of management, control, and evaluation. The baseline(s) will be fixed at a specific point in time in the system life cycle and represent the current approved configuration. Formal change procedures dictate any suggested changes.

The change control process in response to an engineering change proposal links the step necessary for configuration steps across the enterprise and various organizational capacities.

Configuration audits regulate, standardize, and facilitate adherence to applicable CM plans by independently evaluating the current status of configuration items to determine conformance.

Constraints and guidance in CM stem from policies, procedures, and standards set forth at various organizational levels within A&B subject to influencing or constraining the design and implementation. In A&Bs case, the acquirer, DARPA, or supplier, vendors, may contain provisions affecting the CM process as well as their associated tools, methods, and other processes used in system development. ISO/IEC/IEEE 15288 2015 and ISO 10007 2003 standards will guide A&Bs system life cycle processes.

An organizational context is critical for successful CM planning, management, and implementation process. The organizational elements provide a fundamental understanding why constraints are placed upon it.

* + 1. Change Management

A&Bs Change Management Plan (CMP) occurs throughout the whole product life cycle to help control change effects during the execute and control stage. By doing so, program management takes active measures to avoid overruns in cost and schedule, scope creep, poor quality, etc. Participation in the CMP involves team members, program managers, stakeholders, DARPA, and upper members in the organizational chart funding the project.

A&Bs CMP defines change management roles, a change control board, a process for implementing changes, change request forms, change request logs, a software tool for change implementations, and an auditing compliance team.

A senior program manager will be guiding and hold ultimate authority on the CMP. Any employee will be capable of submitting a request to a configuration management team dedicated to handling requests. The configuration management team will then analyze the request and decide the relevant parties who needs to review each configuration change on a case-by-case basis. If a configuration change is reviewed by the necessary parties and deemed necessary for implementation, the senior program manager for configuration management, all project managers involved with the request, employee(s) submitting the request, and configuration management team members conducting the review all must sign off to authorize the change. The parties routinely involved with configuration changes will attend a bi-weekly meeting to assess configuration change update requests. CFEngine will be the software resource for submitting configuration changes and tracking them throughout their life cycle.

* + 1. Requirements Management

Requirements management collects, analyzes, refines, and prioritizes the product requirements so they may be properly planned for delivery. The ultimate goal for managing requirements is to ensure the organization can validate and meet the needs of the customers. A&B will be tracking requirements to ensure compliance with DARPA guidelines and to track the progress of the design requirements. Requirements progress means establishing open lines of communication between projects team members and DARPA so they may be adjusted throughout the project’s course. Through daily communication, better workload and priority balances are established.

A&B will organize requirements as either functional or non-functional. Functional requirements are expected to satisfy specific user needs. They fundamentally describe the business requirements along with the capabilities the intended product can perform.

Non-functional requirements describe qualities of the product, including usability, performance, reliability, and security. They may also describe technical requirements.

A&B strives to address requirements issues early in the product life cycle to avoid design problems stemming from poor requirements. At later stages in the product life cycle, the design issues will be more difficult and expensive to resolve. A&B will dedicate 10% of total program costs to requirements processes to avoid cost overruns.

Some pitfalls A&B will avoid in regards to their requirements:

1. Incomplete requirements
2. Didn’t involve users
3. Insufficient resources/schedule
4. Unrealistic expectations
5. Lack of managerial support
6. Changing requirements
7. Poor planning
8. No longer needed

The requirements process will follow the same procedures as described in Section 5.7.2 Change Management.

* + 1. Interface Management

Interface management describes the activities of defining, controlling, and communicating information needed at the common boundary where direct contact between two different cultues, devices, entities, environments, systems, etc. and multiple contractors, subcontractors, and clients take place. Project interfaces will connect the points between parties or elements, assuming all entities are working towards a common, agreed-upon goal to complete the project. Interface management decreases the changes of miscommunication, lack of communication, or the inability to stay within scope, budget, and schedule to deliver lower risk.

A&B will incorporate the following principles into its own Interface Management processes:

1. Tight control of dynamic interfaces to achieve project cost, schedule, and scope targets.
2. Static project interfaces kept clearly defined through the life of the project.
3. Organizational factors allowing inhibition requiring project integration.
4. Project organization structures needing to change as the project develops.
5. Early, firm design control for effective project control
6. Design/production interface rating the most critical project interface and the most difficult to manage.
7. The required amount of project management effort resulting in a function of project size, speed, and complexity.

Interface management processes will follow similar procedures as described in Section 5.7.2 Change Management.

## Information Management and Product Lifecycle Management (PLM)

Product Lifecycle Management (PLM) describes the process by which A&B will handle the product as it moves through the typical stages of its product lifecycle consisting of development and introduction, growth, maturity/stability, and decline. PLM includes the manufacturing processes and marketing. The end result is to streamline activities to produce a product that outperforms its competitors, is highly profitable, and lasts as long as consumer desire and technology permit.

A&B intends to gain the following benefits:

* Improved product quality and reliability
* Reduced prototyping costs
* More accurate and timely requests for quote (solicitation from suppliers)
* Quick identification of sales opportunities and revenue contributions
* Savings through the re-use of original data
* A framework for product optimization
* Reduced waste
* Improved ability to better manage seasonal fluctuation management
* Improved forecasting to reduce material costs
* Maximized supply chain collaboration

Quality Assurance will review each major sprint task for defect observance. Defects in hardware and software will receive the highest priority. Quarterly data audits will retain the integrity of the data.

[1] “Configuration Management,” *Guide to the System Engineering Body of Knowledge*. [Online]. Available: <https://www.sebokwiki.org/wiki/Configuration_Management>. [Accessed: 02-Mar-2020].

[2] “Learning,” *PMI*. [Online]. Available: <https://www.pmi.org/learning/library/effective-requirements-management-project-success-8181>. [Accessed: 02-Mar-2020].

[3] “Learning,” *PMI*. [Online]. Available: <https://www.pmi.org/learning/library/interface-management-theory-approach-pm-5729>. [Accessed: 02-Mar-2020].

[4] T. Segal, “How Product Lifecycle Management (PLM) Works,” *Investopedia*, 29-Jan-2020. [Online]. Available: <https://www.investopedia.com/terms/p/product-life-cycle-managment.asp>. [Accessed: 02-Mar-2020].

[5] ThePD, “Interface Management,” *The Project Definition*, 01-Oct-2019. [Online]. Available: <https://www.theprojectdefinition.com/interface-management/>. [Accessed: 02-Mar-2020].