MEMORANDUM FOR THE [INSERT MILESTONE DECISION AUTHORITY’S OFFFICE]

SUBJECT: [PROGRAM] Critical Design Review Assessment Executive Summary and Report

The [PROGRAM] conducted its Critical Design Review (CDR) through a series of subsystem reviews from [DATE] to [DATE], culminating in a system-level review held on [DATE]. [OFFICE CONDUCTING THE ASSESSMENT] participated in these reviews and has conducted an assessment of the CDR in accordance with DoD Instruction 5000.88, Engineering of Defense Systems.

I assess the program [has / has not] completed its detailed design and the program [is / is not] ready to begin developmental prototype hardware fabrication or software coding with acceptable risk. Note: If the risk IS NOT acceptable, summarize the risk in one-to two sentences the key risks.

* The design [is or is not] projected to meet all draft Key Performance Parameters (KPPs).
* The program [is or is not] on track to meet Acquisition Program Baseline schedule thresholds (if appropriate).
* The initial product baseline [has or has not] been established and if it [is or is not] under configuration control.

Provide a summary of each of the top program-level technical issues and risks (or state none) and their respective mitigation plans. State your assessment of the program’s ability to adequately manage the risks or the need for further action. Include only the key risks that should be brought to the attention of the MDA. Not all risks in the risk section should be included.

Attached is the detailed assessment. My point of contact for this matter is [NAME and CONTACT INFORMATION].

Approving Signature

Attachments:

As stated

# System Description

The [SYSTEM] . . . *Include a short (one paragraph) description of the system.*

*Include a small picture of the system.*



**DoD’s Most Lethal Weapon**

Figure X. System Name

*Briefly identify key elements of the design and compare them with legacy or similar systems.*

# Conduct of the Critical Design Review

*Assess whether the review was conducted adequately to assess the detailed design (the review chair was appropriate; adequate time was allocated; attendance included program, independent subject matter experts (SMEs) and stakeholders; the process to gather and address attendee’s questions and requests was adequate), was event driven (Subordinate reviews was adequate and properly closed, entrance criteria was met), the maturity of the design was adequate to support the review, and the review was closed properly (exit criteria was met).*

*List the date and location of the system-level Critical Design Review (CDR). If applicable, list the subordinate CDRs leading up to the system-level CDR. Identify and discuss the significance of any open Requests for Action/Requests for Information (RFAs/RFIs) from the subsystem CDRs.*

*State whether the review attendance was adequate to fully assess critical areas of the critical design (Program Management Office (PMO), contractor, critical vendors/partners, independent SMEs and stakeholders). Include a table of the key participants and their organization. [Include as attachment if too long]. Identify the CDR chair(s). Identify independent SMEs, Office of the Secretary of Defense (OSD) offices and user representative that were in attendance. Can put participant table in appendix.*

*List the entrance criteria as identified in the program’s Systems Engineering Plan (SEP). Note: The SEP criteria are the minimum acceptable. If additional entrance criteria were directed by the program, you may also include those. State whether the criteria were met prior to the start of the review. If not, discuss the rationale for continuing, who made the decision to proceed, and the potential impact to the program. [Include as attachment if too long]*

*Identify the percentage of drawings released or appropriate measure of design maturity if drawings are not tracked by the program. Discuss the identification and release of critical safety items and critical application items. For Major Automated Information System (MAIS) programs, discuss release of software architecture products. Assess the impact of incomplete drawings on the detailed design.*

*State the total number of RFA/RFIs generated by the review. Identify all open RFA/RFIs along with their planned closure dates. Discuss the significance of the open RFA/RFIs and their impact on the detailed design.*

*If critical RFA/RFIs are still open, justify why the Milestone Decision Authority should consider the CDR complete (if appropriate).*

*List the exit criteria, as identified in the program’s SEP. State whether the criteria have been met. If not, discuss the significance of the criteria along with their respective closure plans and dates. [Include as attachment if too long] Note: The SEP criteria are the minimum acceptable. If additional exit criteria were directed by the program, you may also include those.*

# Performance

*State whether the detailed design is projected to meet all Key Performance Parameters (KPPs). Assess the impact of any Key System Attributes (KSAs) or Technical Performance Measures (TPMs) the detailed design is not projected to meet.*

*Provide a table of any draft KPPs and KSAs needed to tell the story. Include their threshold values and their estimated performance at the time of the CDR in the Status column. Assess whether the projections are appropriate and credible (projections come from estimates / modeling / test data. Compare to legacy or similar system performance. Large jumps in projected performance are credible, etc.). Include detailed information and TPM status in an appendix.*

Table X. KPP and KSA Status

|  |  |  |
| --- | --- | --- |
| KPPs | Threshold | Status |
| KPP #1 |  |  |
| KPP #2 |  |  |
| KPP #3 |  |  |

*Provide a table of the TPMs. Include their threshold values and their estimated performance at the time of the CDR in the Status column. Assess whether the TPMs are adequate to ensure success of the program KPPs and control program risks (KSAs are linked to program KPPs / key risks and provide leading indication of performance / risk mitigation).*

*Discuss the significance of any requirements not projected to meet thresholds and the plans to resolve these design gaps.*

# Schedule

*Assess whether the program is on track for meeting APB schedule thresholds and to conduct the SE technical reviews reflected in the SEP.*

*Coordinate for a schedule assessment. Note: A program IMS is necessary to support schedule assessments. If unavailable, coordinate with the schedule assessment team to identify appropriate data. This section should include a Defense Contract Management Agency (DCMA) 14-point health check at a minimum. Include a short description of any red areas. Discuss Critical Path and Near Critical Path.*

*Include the technical schedule as shown at the CDR in the appendix. Discuss any significant changes from the current schedule to the one in the program’s SEP. Include a date line locating the CDR on the schedule.*

*Identify the program’s latest Schedule Risk Analyses and summarize the results.*

*Assess the program’s schedule risk exposure. If applicable, identify any key issues/risks that may impact the program critical path. Note: To assess the amount of risk exposure, review the program’s risk register for risks with identified schedule impacts.*

# Technical Risks, Issues, and Opportunities

*Assess whether the program’s risks, issues, and opportunities encompasses the technical effort, and whether plans in place are adequate to control risks and issues. Note: this review may be conducted prior to the system-level review as part of the CDR work-ups. State how many high and medium technical risks were identified or have been identified. State how many significant issues have been identified. State how many opportunities have been pursued.*

*Identify and briefly summarize your top 4-5 risks in the risk cube (Figure X). List all other technical risks in an appendix. Discuss only the technical risks. Note: Provide one summary risk cube. Do not include multiple cubes. Use the risk cube format provided.*

*Assess the PMOs risk mitigation plans and make a statement that the assessment team has reviewed the plans and assesses them as adequate, or that the assessment team recommends additional mitigation steps (be specific).*

Figure X. Risk Cube

= Original Risk Analysis

= Current assessment

= Prediction at next MS or SETR

= Predicted Final

**Risk:** IF GFE aircraft receivers are not received in time THEN the flight test and system verification may be delayed

**Impacts: Cost:** RDT&E: TBD
**Schedule:** 6 months
**Performance:** None

**Mitigation Action(s):**

* + Recommendation A
	+ Recommendation B

Recommendation C

**Expected Closure Event/Date:**Event / Mmm 201X

**Risk**: Flight test efficiencies. IF GFE aircraft receivers are not received in time THEN the flight test and system verification may be delayed

**Impacts: Cost:** RDT&E: TBD
**Schedule:** TBD
**Performance:** Not meet KPP

**Mitigation Action(s):**

* + Recommendation A
	+ Recommendation B

Recommendation C

**Expected Closure Event/Date:**Event / Mmm 201X

**Risk:** If XXX the YYYY

**Impacts: Cost:** RDT&E: $XXXk
**Schedule:** TBD
**Performance:** Not meet KPP

**Mitigation Action(s):**

* + Recommendation A
	+ Recommendation B
	+ Recommendation C

**Expected Closure Event/Date:**Event / Mmm 201X

**Risk**: If XXX then YYYY

**Impacts: Cost:** RDT&E: $XXXk
**Schedule:** TBD
**Performance:** Not meet KPP

**Mitigation Action(s):**

* + Recommendation A
	+ Recommendation B
	+ Recommendation C

**Expected Closure Event/Date:**Event / Mmm 201X

**Risk**: If XXX then YYYY

**Impacts: Cost:** RDT&E: $XXXk
**Schedule:** TBD
**Performance:** Not meet KPP

**Mitigation Action(s):**

* + Recommendation A
	+ Recommendation B
	+ Recommendation C

**Expected Closure Event/Date:**Event / Mmm 201X

*Identify and briefly summarize the top issues in the issue bar (Figure X). Ensure all issues raised in previous assessments/program reviews are reviewed. Discuss only the technical issues. Note: Provide one summary issue bar. Do not include multiple bars. Use the issue bar format provided.*

*Assess the PMOs issue mitigation action and make a statement that the assessment team has reviewed the plans and assesses them as adequate, or that the assessment team recommends additional mitigation steps (be specific).*

Figure X. Issues Bar

**Issue:** XXX

**Impacts: Cost:** RDT&E: $XXXk
**Schedule:** TBD
**Performance:** Not meet KPP

**Mitigation Action(s):**

* + Recommendation A
	+ Recommendation B
	+ Recommendation C

**Expected Closure Event/Date:**Event / Mmm 201X

**Issue:** XXX

**Impacts: Cost:** RDT&E: $XXXk
**Schedule:** TBD
**Performance:** Not meet KPP

**Mitigation Action(s):**

* + Recommendation A
	+ Recommendation B
	+ Recommendation C

**Expected Closure Event/Date:**Event / Mmm 201X

*Identify the top opportunities in the opportunity cube (Figure X). Review the opportunities identified in the latest program SEP. Identify the status of those opportunities. Discuss only the technical opportunities. Note: Provide one summary opportunity cube. Do not include multiple cubes. Use the opportunity cube format provided.*

**Opportunity:** XXX

**Description:**  $XXXk

**Cost of Opportunity**: XXXX

**Potential Cost Benefit:** XXXXX

**Potential Performance Benefit:** XXX

**Opportunity Closure Date:**Event / Mmm 201X

Figure X. Opportunities Cube

# Establishment of the Initial Product Baseline

*Assess whether an initial product baseline has been established (i.e., all allocated baseline performance, interoperability, and interface requirements have been allocated to individual components) and whether the PM has taken configuration control of the Initial Product Baseline as required by DoDI 5000.88.*

*Provide the system specification tree and identify the product baseline in the appendix. If appropriate, identify and discuss if there are any changes from the one provided in the SEP.*

*List the documentation that makes up the initial product baseline (e.g., Critical and prime item detailed specifications, requirements traceability and compliance documents, technical data packages, or Interface Control Documents). Identify and discuss the significance of any documentation not finalized and their respective completion dates. Note: The components of the product baseline should be identified in the SEP.*

*Discuss the definition of hardware and software interface documentation (i.e., interface control documents (ICD), interface description documents (IDD), interface requirements documents (IRD), and architectures). Identify and discuss the significance of any interfaces not defined and their potential impact on the design and manufacturing planning.*

*State how the program will maintain configuration control of the baseline and how the PM has/will assume control of the Product Baseline.*

*Discuss the decomposition of requirements from the CDD/CPD to the Government Specification and down to the Contractor’s developed Specification. Assess the requirements stability and include a table that documents the requirements from SRR through CDR.*

# Design Considerations

## Software

*Assess whether the software development is being executed to the plan. Discuss any significant changes since PDR and their effects on the program. Assess whether the software metrics are adequate to manage the program.*

*Assess whether the software architecture designs have been established; all Computer Software Configuration Items (CSCIs), Computer Software Components (CSCs), and Computer Software Units (CSUs) have been defined. Include a diagram of the software architecture in the appendix.*

*Identify and assess the status of software requirements decomposition to design documentation, build contents, significance of software design not yet estimated, and expected software development schedule and resources.*

*Identify and assess the software code estimates and stability. Provide a table that shows the total SLOC, reused, modified and new code over time in an appendix.*

*Assess the quality of the developed software. Identify the number of open defects in the code.*

*Assess whether the expected software and hardware margins (e.g. Bus capacity, processor usage, computer memory) support future growth.*

## Reliability and Maintainability

*Assess whether the program’s reliability and maintainability (R&M) program is progressing according to plan. Assess whether the program’s R&M plan is adequate to ensure the system meets all R&M requirements. Identify any R&M requirements that are not projected to me met. Assess whether R&M metrics are adequate to manage the program.*

*State whether the program has formulated a comprehensive R&M program and assess their performance to plan. Assess whether tracked R&M metrics are adequate to manage the program. Address whether there are any R&M events that are behind schedule and assess their impact on the program.*

*Assess the program’s reliability and maintainability growth program’s performance to plan. If available, insert the program’s reliability and maintainability growth curve(s). Compare the curve to the one documented in the SEP and discuss any changes. Note. The growth curve horizontal axis should show test hours, schedule, and key events.*

## Integration

*Assess whether all interfaces are defined. If not, assess their impact on the design and manufacturing plan. Assess whether integration metrics are adequate to manage the program.*

*List any external programs that have critical interdependencies and interfaces with the program. Identify and discuss any risks or issues. State whether there are memoranda of agreement with those programs which clearly delineate the roles and responsibilities of each program. Assess whether these external programs’ schedules and demonstrated capability are on track to support the program’s integration, test, and production.*

*Assess whether the program requirements have enough growth margin (SWAP-C, bandwidth, etc.) to support future growth / upgrades.*

## Manufacturing

*Assess whether the manufacturing is progressing according to plan and whether it is adequate to support entry into manufacturing process demonstration. State whether manufacturing assessments are being conducted. Assess whether manufacturing metrics are adequate to manage the program.*

*State whether manufacturing processes and procedures have been demonstrated in a production environment.*

*List and discuss the results of any detailed producibility trade studies and risk assessments that have been conducted or are under way.*

*State whether the identification and assessment of key suppliers has been completed. Identify and discuss any issues or risks in key supplier manufacturing assessments. Assess the long-lead planning’s ability to support production of Engineering and Manufacturing Development (EMD) articles. Assess the planning for production tooling and test equipment design and development*

*Assess whether the supply chain processes and the development and integration environments incorporate appropriate countermeasures to protect the system from malicious insertion to hardware and software and prevent counterfeit products.*

## Cybersecurity / Program Protection

*State whether the detailed design provides adequate protection for critical program information and ensures information assurance and system security.*

*Assess whether the planned cybersecurity efforts are adequate to manage risks to critical program information and mission-critical functions and components associated with the program. If appropriate, discuss whether cybersecurity requirements were adequately flowed to subtier developers and if subsystem CDRs reviewed these requirements.*

## Technology Insertion / Refresh

*State whether the technical plan supports Technical Insertion and Refresh as identified in the program’s Acquisition Strategy. Assess the program’s plan for addressing obsolesce, and tech refresh.*

*Assess the program’s plan for addressing technical refresh and obsolescence. Assess whether the program’s Technical Data Rights strategy, as identified in the program’s acquisition strategy, supports the technical refresh and obsolesces plans.*

*If applicable, discuss any issues or risks to Tech Insertion / Refresh.*

## Other Design Considerations

*Consider other design consideration as appropriate for the program. The table below identifies some (but not all) design considerations that should be considered for inclusion into the assessment.*

*If it is determined that one or multiple considerations are to be included in the assessment, create a new section for each consideration following the sections listed above (e.g. make each consideration formatting match the “Cybersecurity” section).*

|  |  |
| --- | --- |
| Consideration | Attributes to Review |
| Certifications (e.g., airworthiness, safety, spectrum, etc.) | * Plan to obtain certificates
* Schedule to obtain certificates
* Execution to Schedule
 |
| Spectrum supportability and Electronic Environmental Effects (E3) | * Risks or Issues
* Spectrum supportability and E3 requirements defined
 |
| Human systems integration | * Risks or Issues
* HSI inclusion in WIPTs
 |
| Survivability | * Risks or Issues
* Survivability requirements defined
* Survivability verification defined (e.g. Live Fire, Modeling and Simulation)
 |
| Force protection | * Risks or Issues
* Force protection requirements defined
* Force protection verification defined (e.g. Live Fire, Modeling and Simulation)
 |

# Conclusion

*Briefly recap key findings. Include good as well as bad. Make sure you identify all recommendations in the body of the assessment.*

*Limit to 2-3 paragraphs.*

# Appendix A - Acronyms

|  |  |
| --- | --- |
| APB | Acquisition Program Baseline |
| CDR | Critical Design Review |
| EMD | Engineering and Manufacturing Development (phase) |
| IOT&E | Initial Operational Test and Evaluation |
| KPP | Key Performance Parameter |
| KSA | Key System Attribute |
| PDR | Preliminary Design Review |
| R&M | Reliability and Maintainability |
| SEP | Systems Engineering Plan |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |