

**ANNEX M  
TO CONTRACT  
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**Ministry  
of Defence**



**CHALLENGER 2  
LIFE EXTENSION PROJECT  
(CR2 LEP)**

**EARNED VALUE MANAGEMENT**

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## **EARNED VALUE MANAGEMENT PLAN REQUIREMENTS**

### **EVM Requirements**

#### **1. Earned Value Management System Implementation**

1.1. The Contractor shall develop, deliver and update as needed over the term of the contract, an Earned Value Management Plan (EVMP) that:

1.1.1. Describes an EVMS that is compliant with the Association for Project Management (APM) *Earned Value Management: APM Guidelines (2008)*, *The Earned Value Management Compass (APM,2010)* and *The Earned Value Management Handbook (APM,2013)* (collectively, the Nominated EV Standard) or an equivalent standard (such as EIA-748) to be agreed by the Authority; and

1.1.2. Describes how tools, processes and Suitably Qualified and Experienced Personnel (SQEP) are available to support the implementation and use of an EVMS throughout the contract duration. The Contractor shall conduct Earned Value Management (EVM) in accordance with the Approved EVMP until contract completion.

1.1.3. Describes how the EVMS is governed, lists the accountabilities and outlines the approval and timeframe for regular review and updating.

1.1.4. Details how configuration control is applied to the EVMS system. Describes the Change Control process (including but not limited to change to the EVMP, engineering, technical, baseline, or contract changes).

1.1.5. The Contractor shall facilitate the Authority's Representative to conduct a Pre-Contract Award Readiness Review to enable assurance to the Authority of the Contractor's ability to comply with the contract.

1.2. The Contractor shall, within three months (or earlier specified date as agreed by the Authority) after the Contract award, have an established EVMS that complies with the requirements as defined in the Nominated EV Standard and the Approved EVMP.

1.3. The Contractor shall, within a period of three months after award (or as agreed by the Authority), facilitate the Authority review of the Contractor's EVMS in accordance with the Nominated EV Standard for the purpose of assessing compliance with the requirements of the contract.

1.4. The Contractor shall ensure that its EVMS continues to meet the requirements of the contract subsequent to successful completion of an EVMS Demonstration Review, during which any issues found shall be rectified.

1.5. The Contractor shall facilitate the Authority Representative to conduct ongoing System Surveillance of its EVMS in accordance with the Nominated EV standard to assess continuing compliance with the requirements of the Contract. The Authority reserves the right to conduct a review of the Contractor EVMS at any time.

1.6. The Contractor shall, in accordance with the EVMP, provide all facilities and assistance reasonably required by the Authority to conduct EVMS Mandated Reviews (IBRs, Demonstration and Surveillance Reviews) including Readiness Assessments for Contract Extensions or New Contract Phases.

## **2. Contract Work Breakdown Structure**

2.1. The Contractor shall develop, deliver and update a Contract Work Breakdown Structure (CWBS) that meets both the Authority reporting requirements and can be aligned with the Defined Pricing Structure (DPS) where applicable.

2.2. The Contractor shall manage the Contract in accordance with the approved CWBS & CWBS Dictionary. Alignment of data from CWBS to Contract Line Item Number (CLIN) is to be maintained to enable the Authority Contracting, Purchasing and Finance (CP&F) data requirements.

2.3. The Contractor shall maintain and update the CWBS Structure and Dictionary throughout the contract using configuration control as defined within the agreed Change Control Process. Proposed changes to the CWBS that may affect Authority or DPS requirements must be provided to the Authority, within one week of the change being proposed, and must include an updated CWBS Dictionary for Approval. No change that may affect Authority requirements may be implemented without prior approval of the Authority.

2.4. The Contractor may amend the approved CWBS or CWBS Dictionary, without first obtaining the Authority's approval under paragraph 2.3 above as long as changes are formally recorded as part of the agreed Change Control Process under delegated authority and:

2.4.1. All elements affected by the amendment are below the reporting level;

2.4.2. The amendments are consistent with the Approved CWBS; and

2.4.3. The Authority is notified within thirty calendar days of the changes being made.

2.5. The CWBS implemented shall enable reconciliation of the EVMS back to the Contract. The Contractor Budget Baseline shall be equal to the Contract Price minus margin/fees. The Contractor Budget Baseline shall comprise of the Performance Measurement Baseline and Management Reserve. The Performance Measurement Baseline shall be set with a deterministic schedule with the balance of cost being defined as Management Reserve and the balance of schedule remaining being defined as schedule reserve.

## **3. Contract Master Schedule (CMS)**

3.1. The Contractor shall develop, deliver and update a Contract Master Schedule (CMS). This will include the Performance Measurement Baseline (PMB), a current forecast schedule with updated performance against the PMB, and a high-level summary schedule as agreed with the Authority.

3.2. The CMS format shall be agreed between the Authority and the Contractor at the IBR and shall be aligned to the CWBS and EVMS.

3.3. The Contractor shall use the approved CMS as the primary schedule for

managing the Contract.

3.4. The Contractor shall conduct schedule health checks to assure compliance with DE&S standards. The standards applied are consistent with the Defence Contract Management Agency (DCMA) Fourteen Point Schedule Health Checks, or as otherwise agreed with the Authority.

3.5. The Contractor shall ensure that the CMS fully incorporates all of the defined scope within the CWBS and will be used as the basis of the Performance Measurement Baseline (PMB).

3.6. Rolling wave planning may be used when establishing the baseline schedule to set the detail at an appropriate level in relation to the understanding of the work to be delivered. Typically, the planning horizon between detailed work packages and outline planning packages would be approximately 18 months or at natural project break points, as agreed with the Authority. Where planning packages are used, they are expected to have a defined scope, duration and associated budget.

3.7. The Contractor shall ensure that the CMS is created in a format that allows an Export file compatible with scheduling software as defined by the Authority, e.g. Primavera P6 .xer and .xml file. The output of any alternative software systems must be compatible with being translated to an alternative file format as agreed by the Authority.

3.8. The Performance Measurement Baseline (PMB) must be under configuration control with any approved changes in accord with the standards defined in Annex B EVM Requirements. The PMB change log shall describe the changes to time and budget to Control Account level on the change request.

3.9. The contractor shall preserve a record of historical Budgeted Cost of Work Scheduled and not implement retroactive changes, including but not limited to re-baselining the Performance Measurement Baseline, unless approved by the Authority.

3.10. The Contractor may amend the agreed CMS, without first obtaining the Authority's Approval under clause 3.9 as long as:

3.10.1. payments under the Contract are not affected;

3.10.2. the Baseline dates for Contract Milestones are not affected;

3.10.3. the ability of the Authority to meet its obligations under the Contract is not affected; and,

3.10.4. it does not impact any Authority dependent activities.

3.11. Authority approval of an amendment to the Approved CMS under clause 3.9 shall be obtained when the next update to the CMS is required.

3.12. Authority Approval of an amendment to the approved CMS shall not affect either party's responsibilities or obligations under Earned Value Management System (EVMS).

3.13. If the Contractor becomes aware that the baseline is no longer achievable, they shall notify the Authority within seven calendar days.

#### **4. Risk and Opportunity Management**

- 4.1. The Contractor shall maintain a Risk and Opportunity Management Plan (ROMP) that enables a risk process to be jointly managed with the Authority.
- 4.2. Prior to establishing the Performance Measurement Baseline an assessment will be made of the associated risk, allowing an appropriate Management Reserve to be established.
- 4.3. The Contractor shall make it possible for the Authority to engage with the regular risk update process via regular risk reviews and formal risk reporting.

#### **5. Integrated Baseline Review (IBR)**

- 5.1. The Contractor shall, within a period of three months (or earlier as agreed with the Authority) after the Contract Award, be suitably prepared for and participate in a formal on-site IBR by the Authority Representative, in accordance with the Nominated EV Standard to enable an assessment of and acceptance of the Performance Measurement Baseline (PMB).
- 5.2. The Authority may, at its discretion, conduct subsequent IBRs to reassess and accept a revised PMB.
- 5.3. Subsequent to the IBR further EVMS demonstration and on-going surveillance reviews shall be completed to ensure the continued validity of the EVMS.

#### **6. Earned Value Performance Reporting**

- 6.1. The Contractor shall produce EVM reports as specified in the Approved EVMP and displayed in Appendix 1 to this Annex:
  - 6.1.1. Summary Report (Figure 1)
  - 6.1.2. Performance Path (Figure 2)
  - 6.1.3. EV (Figure 3)
  - 6.1.4. AC (Figure 4)
  - 6.1.5. Cumulative Variance (Figure 5)
  - 6.1.6. Variance Analysis (Figure 6) including cause, impact and corrective actions where variances exceed +/- 10%.
  - 6.1.7. Change Log
- 6.2. Changes to the agreed reporting levels, variance thresholds, time increments, reporting threshold and submission dates for the Earned Value Performance Reports as well as changes for the next project phase will be requested by the Authority and agreed between the Authority and the Contractor and documented by the Contractor in an update to the EVMP.
- 6.3. The Contractor shall provide electronic copies of all Earned Value Performance Reports and full open-book access to data (including but not limited to source data for planned value, earned value, actual cost and schedule performance) so that the Authority

can validate the data.

6.4. The Contractor shall provide or make available Suitably Qualified and Experienced Personnel (SQEP) to provide in-depth analysis of EVM data presented, typically to include the Project Control Manager (PCM), Control Account Manager (CAM), and senior Project Controls staff or alternatives to be agreed in advance with the Authority.

## **7. Change Control**

7.1. The Contractor shall develop a Change Control Process in accordance with the Association for Project Management (APM) *Earned Value Management: APM Guidelines*

7.2. The Contractor shall, at Contract Award + 1 month, have an established Change Control Process that complies with the requirements as defined in the Nominated APM Standards as detailed in 7.1

7.3. *The Contractor* shall identify a process that ensures the PMB is not changed without appropriate analysis, communication, and approval. The change control process shall:

7.3.1. Document, track and communicate changes to the Performance Measurement Baseline

7.3.2. Reconcile current budgets to prior budgets in terms of changes to the authorised work in the detail needed by management for effective control

7.3.3. Control retroactive changes to records pertaining to work performed that would change previously reported amounts for actual costs, earned value, or budgets. Adjustments should be made only for correction of errors, routine accounting adjustments, effects of customer or management directed changes, or to improve the baseline integrity and accuracy of performance measurement data

7.3.4. Prevent revisions to the program budget except for authorised changes.

7.4. The Authority shall review, and the Contractor shall ensure that the change control process and procedures meet the needs of the Authority.

## **8. Subcontractor Management – Project Control**

8.1. The Contractor shall ensure that all Major Subcontractors shall manage their contracts in accordance with their own approved project management plans.

8.2. The Contractor shall report combined performance of Major Subcontractor(s) within the agreed Earned Value Performance Reports.

## **9. Subcontractor Earned Value Management Requirements**

9.1. There is no requirement to flow down EVMS requirements to Subcontractor(s).

## **10. Subcontractor Monitoring and Control where EVM does not apply**

10.1. The Contractor shall ensure that the approved Subcontractors monitor progress

against their own plans.

10.2. The Contractor shall ensure that the approved Subcontractors implement corrective actions to address any deviations from any plan.

10.3. The Contractor shall ensure that the Subcontractors prepare and deliver Subcontract status reports to the Contractor within the same intervals that the Contractor reports to the Authority.

10.4. The Contractor shall derive and include EVM data from approved Subcontractors, which corresponds to the data being provided by the Contractor's EVM data.

10.5. Upon request, the Contractor shall provide the Authority with a copy of the Subcontractors' supporting data / basis of performance reports.

## **11. Deliverable Data Formats**

11.1. The Contractor shall ensure that project/programme data can be exchanged using the Authority preferred software tools. These include:

11.1.1. Microsoft Office tools for narrative documents;

11.1.2. Primavera P6 for schedules; or outputs that can be translated to a .xer and .xml file as agreed by the Authority.

11.1.3. Microsoft Excel compatible for numerical reports

11.1.4. Oracle Unifier

11.2. The output of an alternative software system must be compatible with being translated to a .xer and .xml format file or alternative file as agreed by the Authority. The Contractor shall ensure that the CMS is created in a format that allows an export file compatible with scheduling software defined above or as approved by the Authority.



## 12. EVM Glossary

Note: the definitions in the glossary below are limited for the purpose of this Annex.

Term	Definition
Actual Cost of Work Performed (ACWP or AC)	The sum of all cost incurred or accrued up to a point in time.
Association for Project Management (APM)	A UK based chartered body for the project profession that sets standards and values that describe the benchmark for professional project management. For Earned Value Management, the APM standard is embodied in three publications: <ol style="list-style-type: none"> <li>1. <i>Earned Value Management: APM Guidelines</i> (2008),</li> <li>2. <i>The Earned Value Management Compass</i> (APM, 2010), and;</li> <li>3. <i>The Earned Value Management Handbook</i> (APM, 2013).</li> </ol>
Budgeted Cost for Work Performed (BCWP)	Earned Value (EV)
Budgeted Cost for Work Scheduled (BCWS)	Planned Value (PV)
Basis of Schedule (BOS)	A document that provides justification for the durations, resource loadings and logic assigned to tasks in the schedule.
CDRL	Contract Data Requirement List an index of data required from the Contractor
Change Control	A process for ensuring configuration control and obtaining appropriate approval
Contract Budget Baseline (CBB)	The amount of the authorised cost of a contract and the estimated cost of authorised non-priced work. This is the baseline that measures cost compliance.
Contract Cost and Schedule Status Report (CSSR)	A simplified report that provides to DE&S a contractor's position with regard to planned, actual and forecast expenditures over the period of performance of the contract.
Contract Data Requirements List (CDRL)	A listing of the deliverables in a contract.
Contract Extensions	An expansion of some element of a contract that may increase period of performance or scope of work
Contract Line Item Number (CLIN)	A clause in a contract that identifies the items or services being acquired.
Contract Master Schedule (CMS)	The contractor's schedule for accomplishing the scope of work.
Contract Milestones	Those points in time when the Contractor will achieve or expects to receive significant deliverables
Contract Performance Reports (CPR)	A set of reports used in an Earned Value Management System that complies with the APM requirements and EIA 748

Term	Definition
Contract Work Breakdown Structure (CWBS)	That portion of the DE&S Work Breakdown Structure which devolves the contractor's scope of work into manageable subordinate elements.
Contracting, Purchasing and Finance (CP&F)	A DE&S software tool.
Contract Work Breakdown Structure (CWBS) Dictionary	The definition of the content of each element in a WBS that makes clear the scope, schedule and cost associated with each element
Contractor Cost Models	The Contractor designed and populated cost collection tool used for estimating project / contract cost.
Control Account	An element of the Work Breakdown Structure (WBS) where control of scope, schedule and cost are assigned to a responsible person
Control Account Manager (CAM)	The person responsible for achieving the scope, schedule and cost associated with an element of the Work Breakdown structure.
Cost Model	Cost collection tool used for estimating project / contract cost.
Cost Movement Tracker	A statused baseline cost tracker with an incremental and rational set of narratives for variances to the performance measurement baseline (PMB) budgets and risk exposure.
Customer Funded Change (CFC)	Scope outside of the current contractor contract or approved customer scope for which additional DE&S Budget/ or Front Line Command funding is required.
Cost Variance (CV)	An EVM term for the difference between the value of work performed and its cost. (BCWP-ACWP=CV)
Data Capture Templates Guidance	Contractor guideline documentation for the completion of data capture templates.
Data Item Description (DID)	Document defining the data required from a contractor
Defined Pricing Structure (DPS)	A format defined within UK regulation requiring industry to provide data to the Government for all Single Source Qualifying Defence Contracts. A product or service orientated hierarchy that defines the logical relationship among all components to a specific level that does not constrain the contractor's ability to define or manage the project or resources to deliver that project
Demonstration Review	An assessment which is undertaken to assure that a system, such as an EVMS, is demonstrated to be performing as expected.
EAC Cost Risk Register	A Risk Register containing risks, opportunities and issues pertaining to the forecasted exposure following EAC Risk Reviews
EAC Launch / Guidance Documentation	A document containing instructions, assumptions or other criteria relating to the production of an estimate at completion.
EAC Metrics	These are the EVM Independent Estimate at Completion (IEAC) formulae promulgated alongside EVM metrics as a comparator to the EAC

Term	Definition
EAC Movements Template	A spreadsheet that identifies and explains the difference between the status budget at complete (BAC) and latest EAC and the previous EAC.
EAC Risk Movement Tracker	A spreadsheet that identifies and explains the difference between the status Risk set and latest EAC Risk exposure.
EAC Schedule Key Milestones	A list of the key events needed to be completed by the Contractor during the EAC process.
Earned Value Management Plan (EVMP)	A description of how the Earned Value Management System will be applied.
Earned Value Management System (EVMS)	<p>A sound management approach that provides all levels of management with early visibility into cost and schedule performance. An EVMS will:</p> <ul style="list-style-type: none"> <li>• Relate time phased budgets to specific contract tasks or statements of work.</li> <li>• Provide the basis to capture work progress assessments against the baseline plan.</li> <li>• Relate technical, schedule, and cost performance.</li> <li>• Provide valid, timely and auditable data and information for proactive project management analysis and action.</li> <li>• Supply managers with a practical level of summarisation for effective decision making.</li> </ul>
Economic Conditions (ECs)	The financial base position at a specific period of time and where statistics or financial indices may be used for forward years to calculate the outturn position relative to the base.
EIA	Electronic Industries Alliance.
Estimate at Completion (EAC)	The estimated cost to complete (ETC) the remaining scope of work added to the actual cost incurred (AC or ACWP), <i>i.e.</i> , $AC + ETC = EAC$ .
EAC Metrics	These are the EVM Independent Estimate at Completion (IEAC) formulae promulgated alongside EVM metrics as a comparator to the EAC
Earned Value Reporting	The act of reporting Earned Value metrics by the use of defined CPR Formats.
Estimate to Complete (ETC)	The estimated cost to complete the remaining scope of work.
EVMS Output	Each EVMS data trace and the system process execution evidence which is witnessed and examined by the surveillance team during EVMS Reviews in order to confirm Contractor compliance to the Nominated EV Standard.
Government Furnished Asset (GFA)	An asset that is furnished by the government.
Government Furnished Equipment (GFE)	Equipment that is furnished by the government.
Government Furnished Information (GFI)	Information that is furnished by the government.
Government Furnished Structures (GFS)	Structures or facilities that are furnished by the government.

Term	Definition
Government Furnished Items (GFX)	Includes Government Furnished Equipment (GFE), Government Furnished Assets (GFA), Government Furnished Information (GFI), and Government Furnished Structures (GFS).
Independent Estimate at Completion (IEAC)	An estimate that applies a formula to calculate an estimate at completion that is independent of the Control Account Manager or Project Manager.
Integrated Baseline Review (IBR)	An assessment of the content and integrity of the performance measurement baseline.
Major Subcontractor(s)	Those subcontractors where the subcontractor portion of the overall contract cost is equal to or greater than 20% or £20M of the contract
Managerially Significant	Having importance and recognition to the management team.
Mandated EVMS Review	A required assessment.
Mandated Reviews	Required assessments.
New Contract Phases	Additional, subsequent portions of a scope of work.
Nominated EV Standard	The standard that has either been mandated or agreed as governing the Earned Value requirements for a contract.
P3M Integration Team	A DE&S team that is implementing an automated system for project controls.
Payment Milestone	A milestone that has a payment value associated with it.
Performance Measurement Baseline (PMB)	A time phased budget of the work to be performed against which cost and schedule performance is measured
Pre-Contract Award Readiness Review	An assessment of a contractor's ability to execute a contract should it be awarded
Project Control Manager (PCM)	The senior member of the project control team.
Project Controls	The organisation tasked with developing and implementing data gathering, management and analytical processes that predict, understand and constructively influence time and cost outcomes.
Project Controls System Description (PCSD)	A narrative that identifies and describes how a project control system will be implemented, including the data gathering, management and analytical processes used to predict, understand and constructively influence time and cost outcomes.
Rates Treatment	Any change to rates where they differ to those agreed for contract award, baseline setting or as a result updating moving from estimated to actual.
Readiness Assessments	The Contractor process for measuring organisational preparedness and identification of needs and development prior to execution of major phases of a contract.
Risk and Opportunity Management Requirements	The scheduled timing of activities and governance for review, update, modelling and publication of the cost risk for the contract.

Term	Definition
Risk Register	A log or table that contains the identified risks for performing a body of work. It includes a description of the risks, a description of the actions which are to be taken to avoid or reduce the risk, the probability of occurrence and the impact if realised.
Schedule / Time Risk Analysis	See Schedule Risk Analysis (SRA).
Schedule Risk Analysis (SRA)	A probabilistic assessment of the likelihood of occurrence of a range of durations when that range of durations is applied to the tasks within a schedule.
Schedule Risk Analysis Updating Process	The scheduled timing of activities and governance for review, update, modelling and publication of the schedule risk for the contract.
Statement of Work (SOW)	A narrative of the scope to be accomplished.
Suitably Qualified and Experienced Personnel (SQEP)	A person or persons with sufficient demonstrated experience and relevant qualifications to provide assurance that they will be able to accomplish the work assigned to them.
Surveillance Review	An assessment which is conducted periodically of the Contractor EVMS to assure the Authority that the system is performing as expected.
Schedule Variance (SV)	The difference between the Earned Value (EV) and the Planned Value (PV).
System Surveillance	An assessment which is undertaken to assure that a system, such as an EVMS, is performing as expected.
Variance at Completion (VAC)	The difference between the Budget at Completion (BAC) and the Estimate at Completion (EAC).
Work Breakdown Structure (WBS)	Defines how the scope of work is subdivided to accomplish the overall objective.

APPENDIX 1

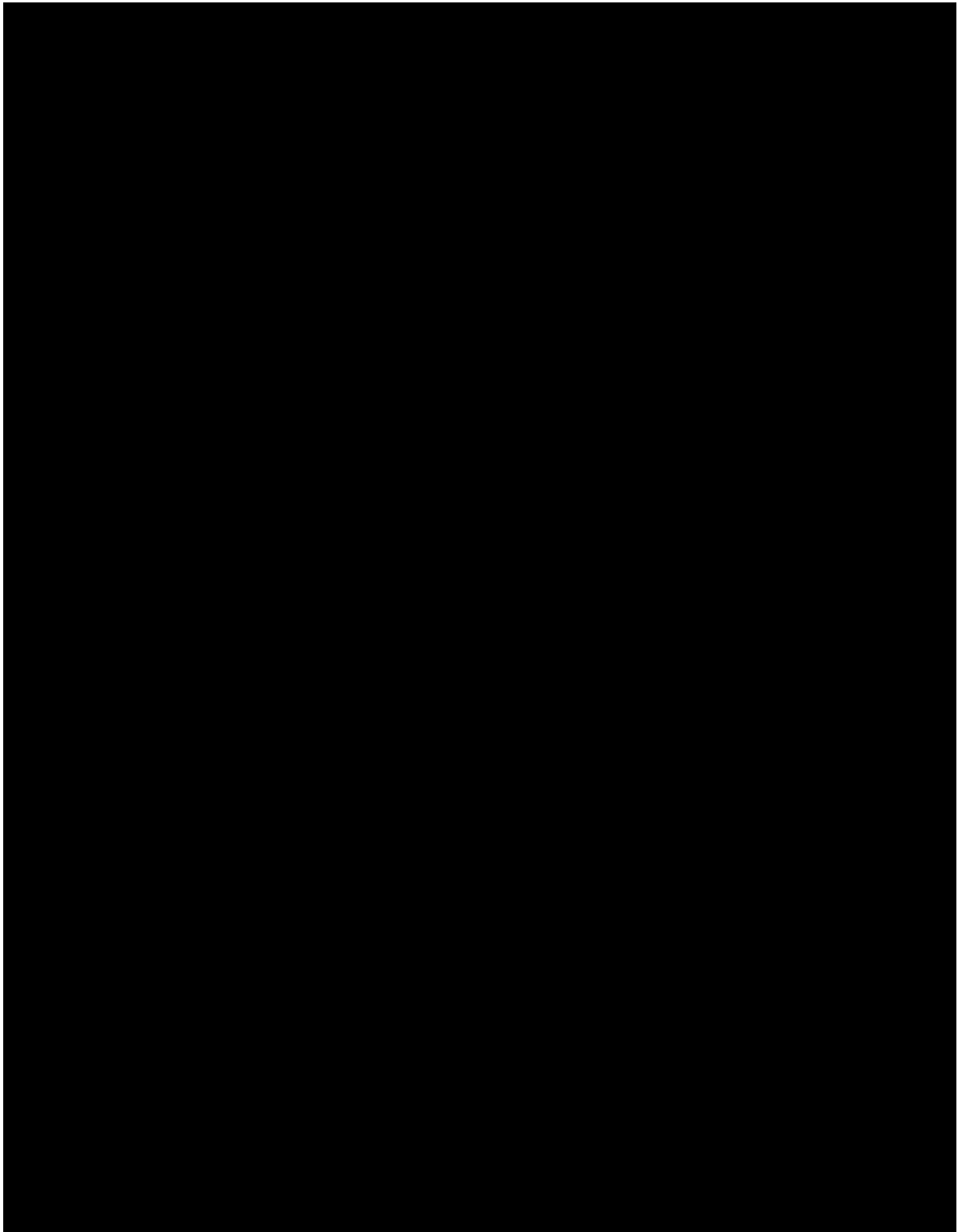


Figure 1: Summary Report



Figure 2: Performance Path

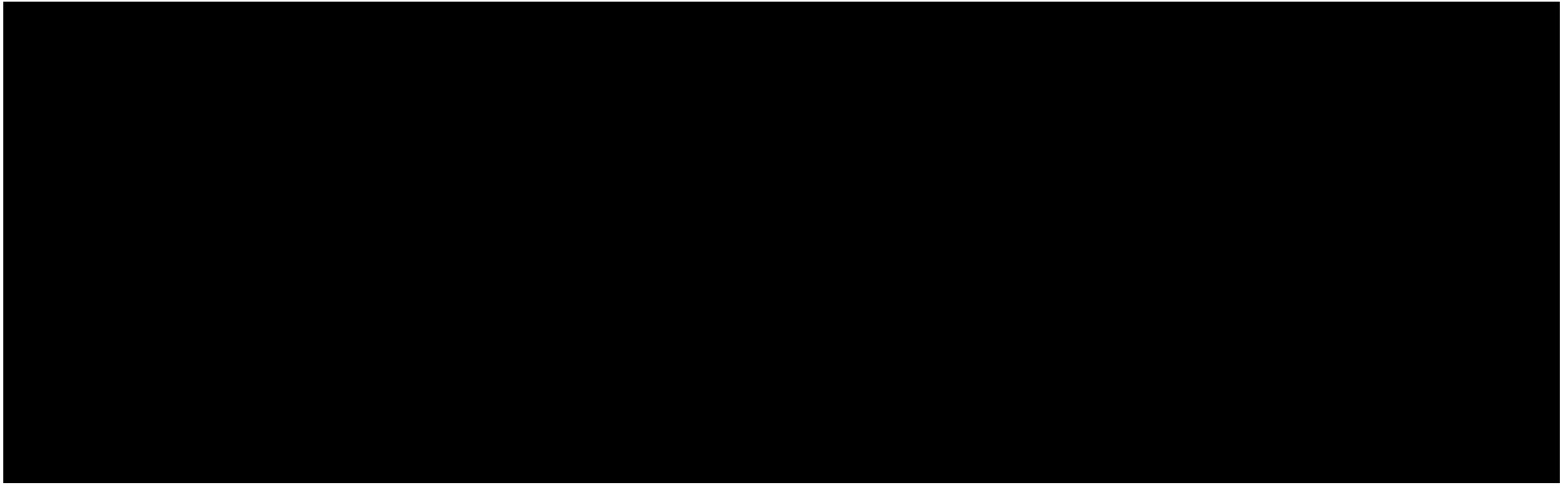


Figure 3: EV

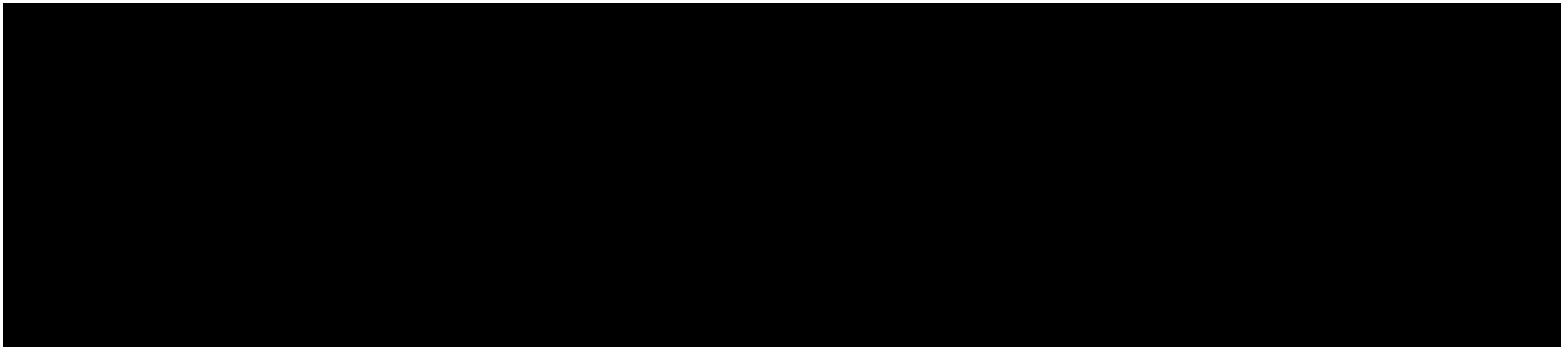


Figure 4: AC



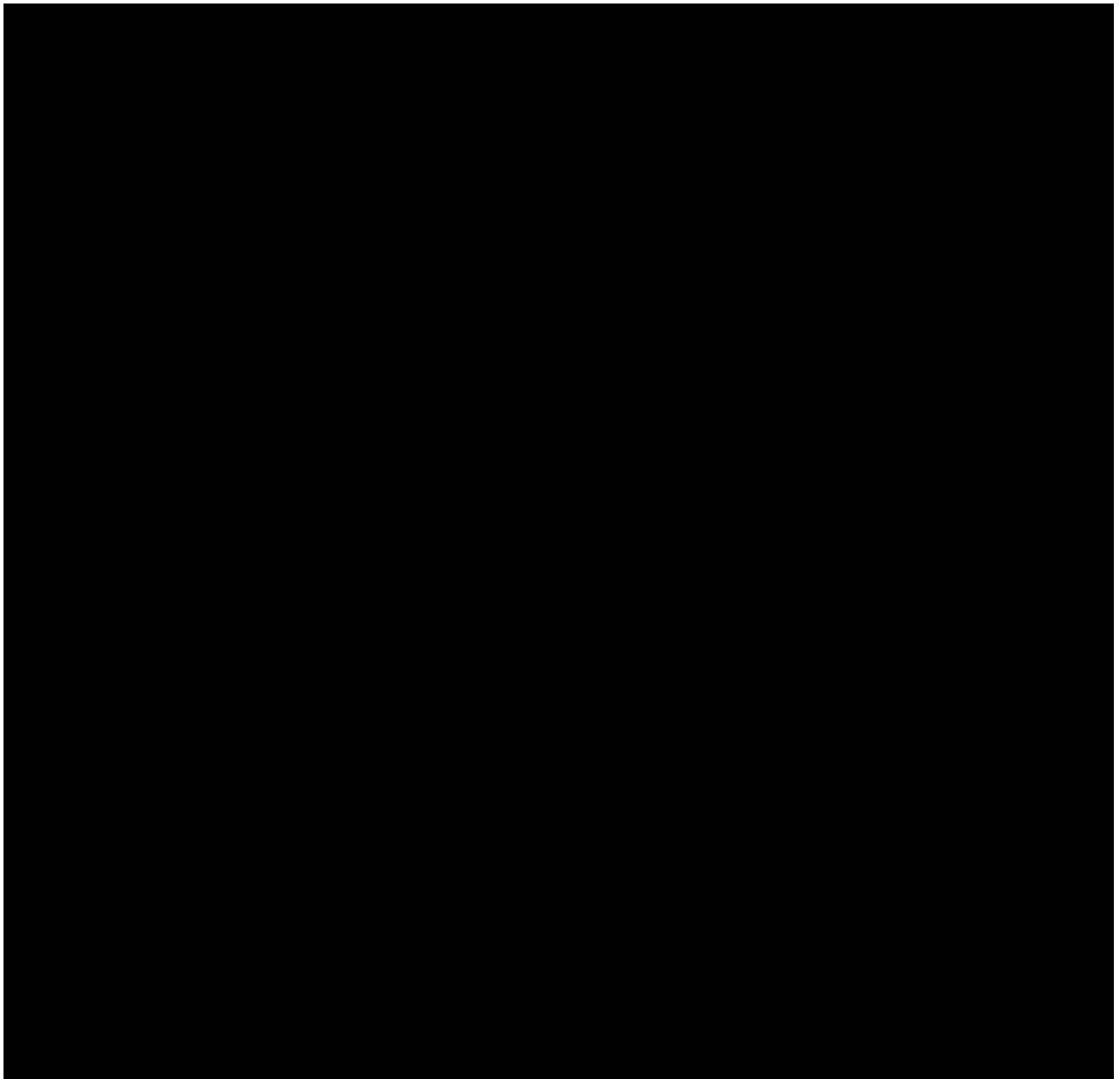


Figure 5: Cumulative Variance

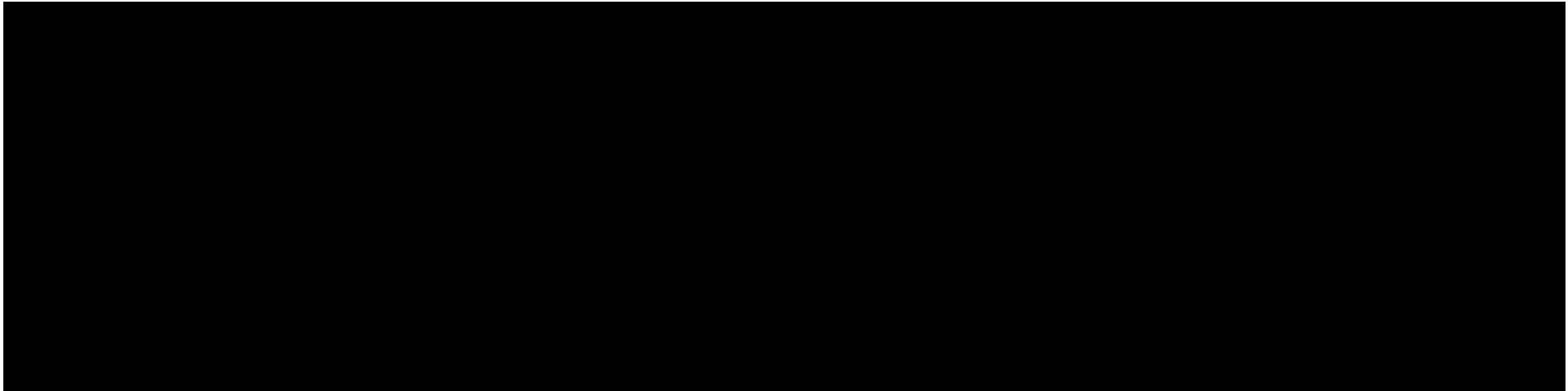


Figure 6: Variance Analysis