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| **Project Name:** | **sPHENIX DAQ & Trigger** | **Date Issued:** | **12/09/2022** |
| **WBS/Control Account Number:** | **WBS 1.6** | | |
| **Control Account Manager Name (CAM):** | **Martin Purschke** | | |
| **Control Account Title:** | **DAQ/Trigger** | | |

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| **Purpose:** |
| The purpose of this form is to document acknowledgement by authorized Control Account Manager and Project Manager that work has been completed as defined in the WBS Dictionary for the above Control Account and the corresponding system KPPs (defined in PEP/PMP) are met.  By answering YES to the following questions, you acknowledge all work has been completed and reconciles with the WBS Dictionary. Sign, date and return this form to Project Controls attention Chris Herbst, Bldg 490.  If NO is checked, please use the space below to provide details on all required modifications (additions and deletions) to the WBS Dictionary. Sign, date and return this form to Project Management Center (attention Chris Herbst, Bldg 490.) |

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| **Scope Baseline:** |
| WBS Dictionary (as per latest baseline): The Data Acquisition And Trigger System For The sPHENIX Experiment At RHIC  The WBS 1.6 DAQ/Trigger provides needed data acquisition hardware to collect and store digitized data from all the sPHENIX subsystems and transmit it to offline storage in the RHIC Computer Center. It also includes a Local-Level-1 trigger system to make decisions at a subsystem basis on a beam-crossing-by-beam-crossing basis of which collisions to record, a Global-Level-1 trigger system to coordinate the inputs from the Local-Level-1 trigger system and make the overall decision whether to record the results of a given beam-crossing, and a Timing system to synchronize all of the DAQ and trigger modules as well as all the front-end electronics for the various subsystems. |
| System KPPs (Objective and Threshold; as per latest baseline)  Event rate:  Threshold: 10 kHz w/ random pulser  Objective: 15 kHz w/ random pulser  Data Logging rate:  Threshold: 10 Gbits/s with pulser  Objective: Same |

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| **KPPs achieved:** |
| Explain the KPPs achieved and how it is demonstrated. (Attach test results/ reports where applicable)  (See attached report) All KPPs are achieved. |

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| **Cost Baseline:** | | | | | | | | |
| Control Account Baseline Cost: $1,123,588 | | | | | | | | |
| Control Account Actual Cost: $1,154,532 | | | | | | | | |
| Control Account CPI: 0.97 | | | | | | | | |
| Estimate to Complete: $0 | | | | | | | | |
| Summary of cost overrun/ underrun:  There are two sources of the negative CV of -$30,944.  There have been about $90K of development costs for the Global-Level-1 and Timing systems that were not included in the baseline plan. The baseline solution was found not to support the needed level of timing and trigger signal fanout needed to support the entire sPHENIX electronics complex. These are fast signals that must align to within a few nanoseconds and reach all channels of the sPHENIX front-end electronics. The development of a fanout board to provide the necessary large number of timing fibers required about one year of development. This includes both labor and electronics parts and assembly purchases.  There are outstanding invoices for $64K of parts and production labor for the LL1 trigger system and timing system, which are otherwise complete. This will reduce the CV to about -$95K once paid and reduce the CPI to about 0.92. This net CV is about as expected based on the added development cost needed for the GL1 and Timing systems. | | | | | | | | |
| **Questions: [*Check Yes or No]*** | | | | | | | |
| 1. Is all work scope for this Control Account complete (all activities per the project baseline attached to this form) | | | | | | | |
|  | Yes | | |  | | No | [If NO, indicate required actions in the below table] |
| 2. Does the WBS Dictionary accurately represent the work completed? | | | | | | | |
|  | Yes | |  | | No | | [If NO, explain in the below table] |
| 3. Any scope (affecting system KPPs) removed from project baseline after necessary approvals? | | | | | | | |
|  | Yes |  | | | No | | [If NO, reference the baseline change document in the table below] |
| 4. Any scope (not affecting the system KPPs) removed from project baseline after necessary approvals? | | | | | | | |
|  | Yes |  | | | No | | [If NO, reference the baseline change document in the table below] |

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| **Notes and Required Actions:** |
| 1. Activities required to complete all work in this Control Account, with expected finish dates: All activities are complete. |
| 1. WBS Dictionary requires the following changes: None |
| 1. The following scope (affecting system KPPs) has been removed from project baseline (Note: Prior approval required, refer baseline change documentation): None |
| 1. The following scope (not affecting system KPPs) has been removed from project baseline (Note: Prior approval required, refer baseline change documentation): The DCM-II modules were removed from the Resource Loaded Schedule. This was recorded in PCR-034A to remove the scope from the WBS 1.6 (7/28/2022) and PCR-035A to correct the TotalProjectCost and contingency (8/22/2022). |

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| **Acknowledgements:** | | | | |
| I acknowledge all work is complete as defined in the WBS Dictionary and the system KPPs have been met for this Control Account.  Any remaining cost on this Control Account has been estimated thoroughly and documented in this report. | | | | |
| **Acknowledgement by CAM** | |  | **Acknowledgement by Project Manager** | |
| **CAM Name:** | **Martin Purschke** | **Project Manager:** | **Glenn R. Young** |
| **Signature:** | Text, letter  Description automatically generated | **Signature:** |  |
| **Date:** | **12/9/2022** | **Date:** | **12/9/2022** |

Attachments:

1. P6 baseline
2. Current working file (with baseline attached)
3. Test results/ reports (if applicable)