

**Office of Project Assessment
Office of Science**

COVID-19 Project Impact Worksheet

Overview Information	
Date of Report	April 1, 2021
Project Name	sPHENIX
Laboratory/Project Location	Brookhaven National Laboratory
SC Program Office	Nuclear Physics
Federal Project Director	Robert Caradonna – BHSO Point of Contact
Project Director/Project Manager	Edward O'Brien

Project Status (as of date) February 28, 2021		
Project Type	Line Item / Major Item of Equipment (MIE)	
CD-0	Planned:	Actual:
CD-1/3A	Planned: August 2018	Actual: August 2018
PD-2/3	Planned: Sept. 2019	Actual: Sept. 2019
PD-4	Planned: Dec 2022	Actual:
TPC Percent Complete	Planned: 79.88%	Actual: 64.2%
TPC Cost to Date	\$15,659K	
TPC Committed to Date	\$5,014K	
TPC	\$27,000K	
TEC	\$20,577K	
OPC	\$6,423K	
Contingency - Cost	\$2,146K	% to go: 24.1 on ETC
Contingency - Schedule	10.75 months	% to go: 91.5%

COVID-19 Cost and Schedule Impacts				
Annual standing army cost (March 2020 to March 2021) ¹		\$ 230K/Year		
Estimated number of FTE (March 2020 to March 2021) ²		10 FTEs		
Escalation (weighted average of labor and material rates from March 2020 to March 2021) ³		1.1%		
		Cost Impact (see Note 2)**		
		High Impact	Most Likely Impact	Low Impact
TPC	\$27,000K	\$0	\$0	\$0
TEC	\$20,573K	\$0	\$0	\$0
OPC - Complete	\$6,423K	\$0	\$0	\$0
		Schedule Impact (in months)(See Note 1)*		
		High Impact	Most Likely Impact	Low Impact
		No impact on PD-4 date	No impact on PD-4 date	No impact on PD-4 date

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*Note 1: As of February 28, 2021, sPHENIX has 10.75 months of schedule contingency. Even with a mitigation approach fully implemented it is likely that the baseline early completion date, Oct 2021, will be delayed as follows: **High Impact 8 mo./Most Likely Impact 6 mo./Low Impact 4 mo.** Any additional BNL or major sPHENIX University (UIUC, SBU) shutdown will delay the project schedule 1 month for each month of shutdown. The PD-4 date will not be impacted.

Note 2: The Cost Contingency impact is as follows: **High Impact \$1900k/Most Likely Impact \$1600k/Low Impact \$1400k. There is adequate contingency available to not impact the Total Project Cost. We have committed \$1400k in contingency to date to mitigate schedule delays due to COVID-19. We do not currently anticipate committing any additional funds to mitigate further COVID-related schedule delays. However this could change if COVID cases require future shutdowns of BNL, key collaborating universities or essential industries.

¹ The annual standing army cost or current staff charged to the project (including any support contractors) from March 2020 to March 2021. This includes cost that is fully burdened or loaded. Use actual numbers when available.

² The number of estimated FTEs from March 2020 to March 2021. The FTEs should correspond to the standing army cost provided. Use actual numbers when available.

³ The escalation rates (labor and material—weighted average) the project use and any expected changes from March 2020 to March 2021.

BNL began resumption of Operations for Phase 1 (Continuation of Essential Mission Critical Operations and beginning of Limited Operations) on June 4, 2020. BNL began Phase 2 of Limited Operations on July 6, 2020.

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Current Project Stage / Most Recent Critical Decision:

If the most recent critical decision was CD-1 or CD-2, are remote capabilities sufficient to keep the project reasonably on schedule? Provide an overview of activities.

For projects beyond CD-3/CD-3(x) ONLY, provide the following:

- What are the current site conditions? BNL's work re-start is in Phase-2/Stage-B, which is "Limited Operations." sPHENIX has approximately 80% of our technical staff authorized to work on site at BNL. On average approximately 70% of our technical staff is on site on any one day. Visiting scientists and students from the collaborating universities have been given BNL permission to work on site on sPHENIX testing and assembly activities. Visitors follow all BNL ES&H protocols and NYS quarantine requirements.
- Identify any potential Safeguards and Security and/or Environmental, Health and Safety concerns: None. We are following all BNL ES&H protocols including those related to COVID risk mitigation.
- What type of work continues to be performed, identify whether remote, or onsite? On site work includes the fabrication and testing of sPHENIX EMCal and HCal components in the respective detector factories, the testing of electronics boards and the fabrication of custom cables. Work that continues to be performed remotely includes engineering, design, procurement, documentation, project management and fabrication at vendors. Work at all university collaborating institutions has restarted with the implementation of a low-density labor environment.
- What type of work has been stopped or delayed? What is the nature of the delay? All fabrication work at BNL and most work at universities had been delayed during the COVID work-pause. Fabrication and component testing have restarted both at BNL and collaborating universities since June though work is inefficient due to COVID protection measures.
- Are the delays beyond the control of the contractors or vendors in performing the work scope? No.
- Can the impacts be readily quantified (cost/schedule impacts)? We have committed approximately \$1400k in contingency to date to mitigate COVID impacts to the schedule. If COVID impacts to the schedule increase, additional contingency will be committed to maintain the schedule. To date we have mitigated schedule impacts by hiring additional labor at BNL and the collaborating universities to increase assembly and testing rates of detector

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components and to make up for lost undergraduate labor. There is a potential for a future cost impact due to efforts to maintain the project early completion date. The sPHENIX CPI is 1.02. The early completion date slipped 1 week in February 2021 due to impact from COVID rates in the US. There are 10.75 months of contingency remaining between the early project completion date and the PD-4 date. The SPI is 0.80. Mitigation strategies are being implemented to recover the lost schedule time and recover the early completion date to the original date. The mitigation plans include using budget contingency to increase the labor on the project and to buy additional equipment to speed up production at certain sPHENIX component production facilities.

- What are the potential impacts to the contract (possible REAs/draws on contingency)? None
- Are any delays resulting from supply chain disruption? Yes. Electronics and material deliveries had been delayed due to COVID-19 in April and May 2020, and again starting in November 2020 and continuing through February 2021. In addition, we are currently experiencing delays at some machine shops and parts production facilities due to COVID. Schedules of vendor deliveries seem to be improving in March.
- Are overseas vendors being impacted? Yes. Overseas vendor deliveries are experiencing delays due to COVID-19.
- Has the contractor demobilized? BNL was in minsafe mode from the end of March 2020 to the first week of June 2020. BNL is now in Phase-2/Stage B, "Limited Operations" mode.
- If project is in stand-by / shutdown status, provide a summary of what will be required to restart activities? BNL is in Phase-2/Stage B of the restart as of July 22, 2020.
- Any additional impacts to the DOE/SC mission not considered above? None