



2024 NSF RESEARCH INFRASTRUCTURE
WORKSHOP

MARCH 26 - 29, 2024 • TUCSON, ARIZONA

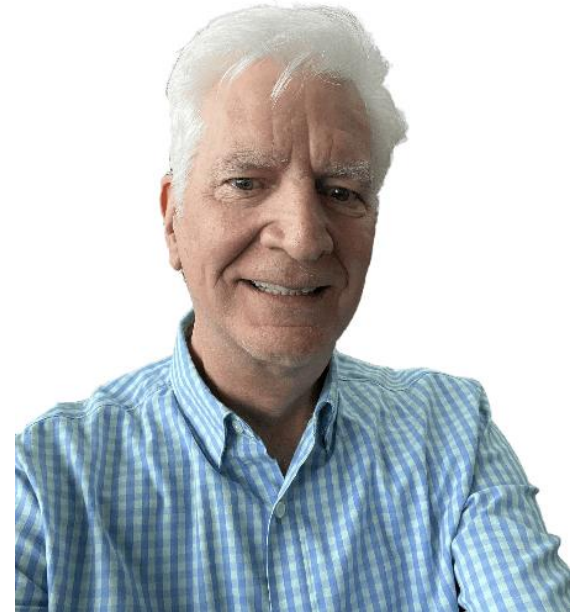
Change Control:
A tour of RIG guidelines, an example of
complex change control of a NSF fixed price
award, and Q&A

Image Credit: Vera C. Rubin Observatory, CTIO/NOIRLab/DOE/NSF/AURA T.A. R. Richard F. Caris Mirror Lab/Gabrielle Perez



Blaise Stephanus

- PMP #281175
- PMI-ACP #1581514
- 20+ years of NSF program management experience
- Program Manager Ice Drill Program at Dartmouth College
- Project Management Advisor for various universities, non-profits, and the NSF
- Past experience:
 - Deputy Program Manager – Earthscope
 - Adjunct faculty – University of Denver
 - Project-Business Manager – Ball Aerospace (satellite – space systems)
 - Senior technical Analyst
- Education: BS/BA Northeastern, MS University of Colorado





Overview

Change Control manages changes to the Baseline Plan
Baseline (scope, budget, or schedule)
Contingency moves into or out of the Baseline
May involve a change control board (CBB)

Utilizes tools:

- Change log
- Change Management Plan including change management approval document (may be in PEP or referenced)
- Contingency draw down logs/charts

Used during implementation

Configuration Control Manages Changes to the Deliverables (Technical Control Board)



Performance Management and Measurement (PMM) The Project Baseline

Total Project Cost (TPC) = The Project
Baseline (Performance Measurement
Baseline PMB) + Contingency

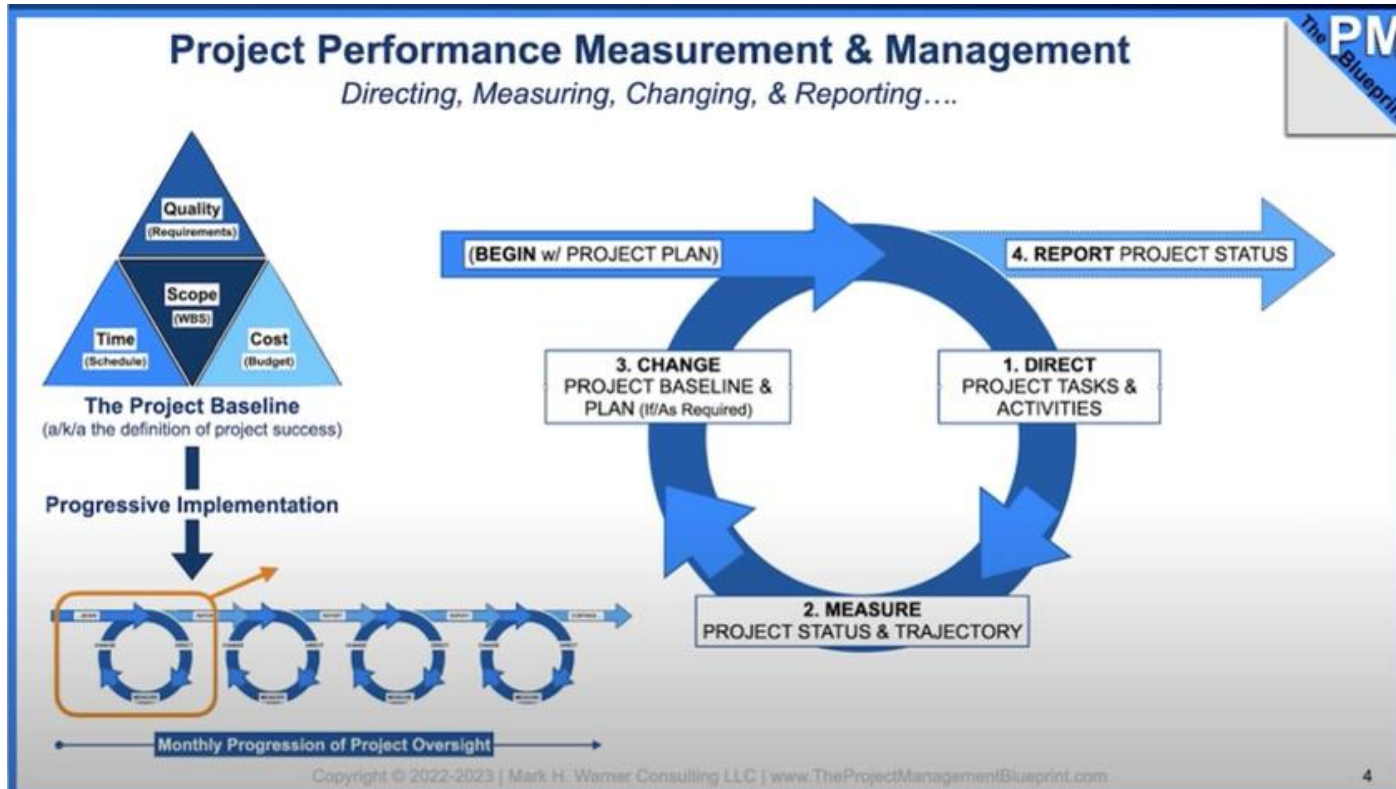
A Change control system manages
changes, to the PMB, to the TPC



The Project Baseline
(a/k/a the definition of project success)



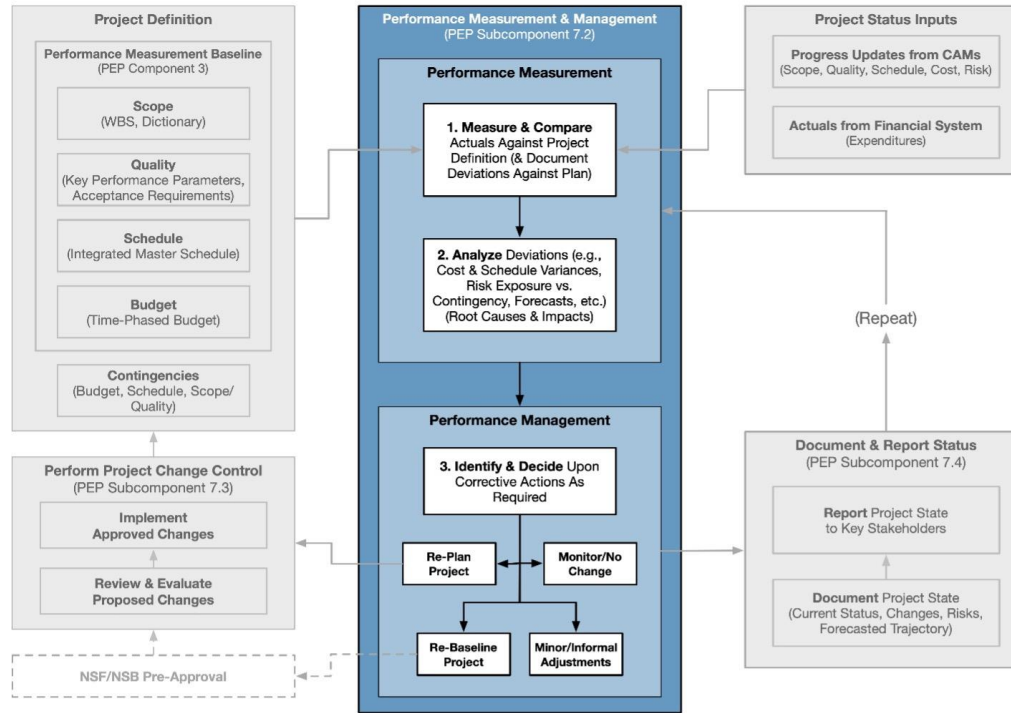
Performance Management and Measurement (PMM) Execution





Change Control is part of Performance Measurement and Management

The Project Controls Process





Change Control is part of Performance Measurement and Management

Performance Measurement and Management - Identify and Decide upon corrective actions as required

- Monitor/No Change
- Minor/Informal Adjustments (of current estimate, schedule – not the baseline)
- Re-Plan Project
- Re-Baseline Project



Replanning

Modifications to the PMB that are within the defined scope and do not change the total project duration or Total Project Cost (TPC). They often include:

- Adjustments or re-organization of the project plan
- Contingency being expended or replenished from PMB
- Minor changes in scope
- Minor de-scoping options (or to defer scope)
- Project enhancements



Re-baselining

Modifications to the PMB that Increases the total project cost (TPC), and/or an extension beyond the total project duration, and/or a major change in scope.

- Approval process involves NSF and may involve the NSB
- Changes in project end date follow NSF's no cost extension (NCE) policies
- An increase in TPC exceeding 20 percent of the NSB-authorized TPC or \$10 million (whichever is less) must be reviewed and authorized by the NSB following a recommendation by the Director.



Change Control in the Research Infrastructure Guide (RIG)

Research Infrastructure Guide (RIG) Change Control and related Guidance NSF 21-107 (December 2021)

2.4.1 Construction Award Management and Oversight

4.2.5 Risk Planning for the Construction Stage (no-overrun, contingency)

4.6.5 Re-Baselining



Richard Grubb

- Very diverse project experience
 - Iron Worker for 4 years
 - Spent 14 years working for award winning contractor
 - Purchasing Manager for all company projects and facility.
 - Project Controls and Scheduling on Navy Projects
 - First Project Management assignment was to design/build moveable roof for the Boeing 777 assembly building.
 - Sales and Estimating all projects for company for 2 years
 - Project Manager on several Nuclear dry storage containers contracts working to ASME NQA1.
 - Project Manager on contract to build first 3 prototype Ground Based Missile Defense Silos and Silo Closures.
 - Project Controls Manager on follow on GMD Silo, Closures production (started with 10, then 20, eventually the company did over 300)
 - I was loaned out to Bechtel to create IMS for the entire world wide GMD Program for Boeing in Huntsville, AL
 - Since 2004 have been assisting Project Management on Large Science projects for the NSF and DOE:
 - NSF – ALMA, DUSEL (now SURF), and RCRV
 - DOE - NSLS-II, WTP – Hanford, DUSEL (now SURF), NSLS-II Beamlines, ATF, Isotope, RHIC Upgrade



RCRV - Project Management Specialist



Project Example: RCRV

Regional Class Research Vessel

3 Ships 199.5 ft Long

Award Value: \$391.5M

Award Type: Cooperative Support Agreement (CSA)

Oregon State University,

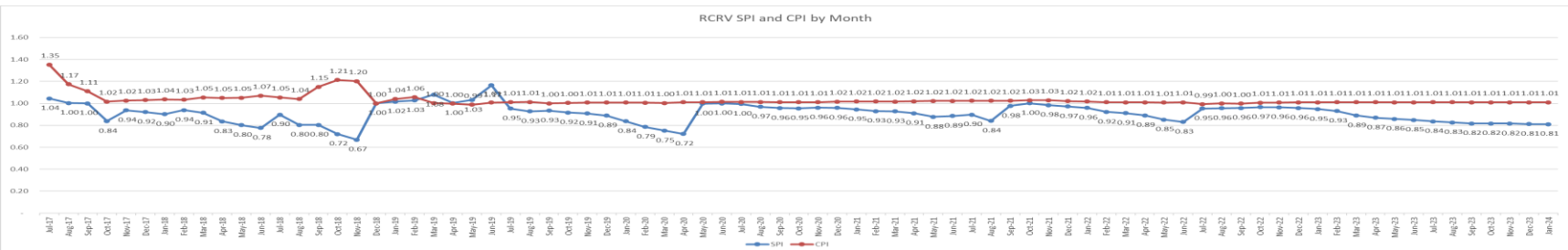
Project Manager: Demian Bailey

Number of Re-baselines (0)

Replan Drivers: Vessel Lengthening, Supplier Failure in Design Phase, COVID-19, and Hurricane Ida



RCRV SPI and CPI by Month





Starting Change Control on a Project

- The RIG is a Guide focused around MREFC funding.
- Formal Change Control should be considered for any type of funding where stakeholders may need to know decision points and the effect of the decision point.
 - I have been involved on large complex projects early on and set up Formal Change Control for the PDR phase where 30%, 60% and 90% gates were formal project events . These events included In-House and External Independent for Comparison of BAC Estimate, Risk Assessment, and Contingency.
 - During this time the Formal Change Control process is tailored and periodically cycled.
 - When the Construction Phase starts the process is working well.

- “The Change Control Process should be initiated when the Total Project Cost target is established at the Preliminary Design Review and followed for the duration of the project.”

Research Infrastructure Guide: NSF 21-107 (December 2021) 6.2.11
Contingency Management for Risk Mitigation *Prepared by the Large Facilities Office in the Budget, Finance, and Award Management Office (BFA-LFO)*

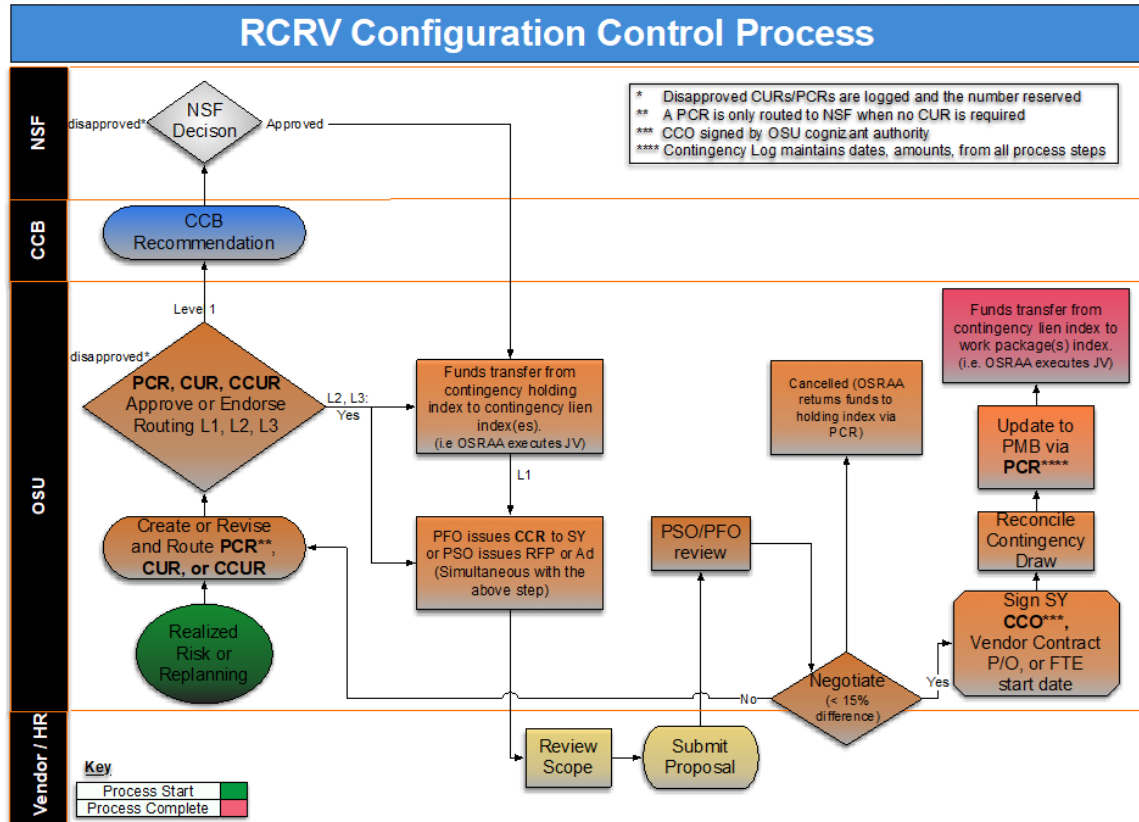


Example RCRV Change Control

Every month CAMs answer the question:

Is there a possible future draw on contingency on their radar?

- These Steps in the process have their own log/table
 - Draft Lien
 - Liens
 - Vendor CO Logs
 - PCR Log
 - Contingency Log (\$ and Days)





RCRV Liens

Contingency Use Request Log (CUR)

- Shows draft, disapproved, and approved
- Shipyards CUR Log is separate and has 116 to date
- The rest of the project has had 20 as shown to the right
 - CURs identify work that needs to be done but is not in BAC.
 - CUR Status:
 - Draft
 - Highlighted cells indicate draft TBD
 - One draft is almost 2 years old. Timing of implementing changes is important. We are in Phase III of the project and we have draft CURs for Phase IV.
 - Approved
 - Move Budget from Project Contingency to CAM Specific Lien Accounts.
 - PMB
 - An approved Project Change Request (PCR) has been approved and the CUR has been implemented into PMB.
 - Budget is moved from the Lien accounts to budget work package accounts in BAC.

No	CUR #	Prepared	Lev	Status	CUR Approved	CUR Title	CUR Value	Implemented in PMB	Month in PMB	Implemented Value	Delta CUR to Implements	Risk	Risk Description	Comment	CAM
1	P001	18-Sep-18	1	PMB	25-Sep-18	Project Controls Specialist Phase III Operating Institution's TRO	\$2,835,921	PCR-002	Oct-18	\$2,835,921	\$0.00	1.08	Project Management Capacity		Bailey
2	P002	18-Sep-18	1	PMB	25-Sep-18	Support	\$511,000	PCR-004	Dec-18	\$511,000	\$0.00	33.02	Operator Capacity		Swenson
3	P003	6-May-19	1	PMB	10-May-19	PCDRM Design Build	\$840,000	PCR-030	Aug-19	\$840,000	\$0.00	11	Requirements Changes		Swenson
4	P004	8-Sep-20	1	Disapproved	N/A	Sensor Requirements Change_CTD-Frame	\$330,000	N/A	N/A	\$0	\$0.00	11	Requirements Changes		Swenson
5	P005	29-Oct-19	1	PMB	30-Oct-19	OII (OSU) Pier Facility Electrical Upgrade	\$210,000	PCR-104	Jan-22	\$210,000	\$0.00	46.04	Institution Equip Unavailability		Swenson
6	P006	21-Jan-21	1	Draft	TBD	Sensor Opportunity USBL	\$1,076,775	TBD	TBD	TBD	\$0.00	11	Requirements Changes	230420 DS S in form does not include spare. Glosien making new Estimate for bracket (Form needs to be updated)	Swenson
7	P007	5-Feb-21	1	PMB	26-Jan-23	QIR1 Phase IV Support Additional Budget Required	\$2,404,327	PCR-133	Feb-23	\$2,404,327	\$0.00	48 & 55	Unanticipated Crew, Shore and Mandated Manning Costs		Swenson
8	P008	15-Jan-21	1	Draft	TBD	Science Mission Expert Support	\$2,023,019	TBD	TBD	TBD	\$0.00	48	Unanticipated Personnel Costs	230420 DS working	Swenson
9	P009	26-Feb-21	1	PMB	1-Mar-21	Custom Built CTD Frame	\$340,000	PCR-080	Feb-21	\$340,000	\$0.00	11	Requirements Changes		Swenson
10	P010	21-Sep-21	1	PMB	23-Sep-21	Personnel Van V2	\$225,000	PCR-091	Aug-21	\$225,000	\$0.00	11.05	Requirements Changes V2		Swenson
11	P011	27-Jan-22	3	PMB	28-Jun-22	Switch Requirement Change	\$28,500	PCR-123	Nov-22	\$28,500	\$0.00	6	Emergent Technologies		Swenson
12	P012	22-Dec-22	3	PMB	27-Dec-22	Shoatel Storage	\$32,400	PCR-123	Nov-22	\$32,400	\$0.00	74	Hurricane Id Risks		Swenson
13	P013	27-Jun-22	1	PMB	26-Feb-23	Cyber Infrastructure Market Forces Increase	\$369,278	PCR-134	Feb-23	\$369,278	\$0.00	58	Market Forces		Swenson
14	P014	27-Jan-22	2	Draft	TBD	Post Delivery U-Tube Support	\$90,831	TBD	TBD	TBD	\$0.00	11	Requirements Changes	230420 DS evaluating	Swenson
15	P015	3-Oct-22	3	PMB	7-Oct-22	Rain Gage Replacement	\$34,860	PCR-122	Nov-22	\$34,860	\$0.00	11	Requirements Changes		Swenson
16	P016	19-Oct-22	1	PMB	27-Oct-22	Correction to Rates	\$961,000	PCR-113	Sep-22	\$961,718	-\$717.67	1	Project Management Capacity	Correction to Rate Mistakes implementing PCR-106	Bailey
17	P017	31-Oct-22	3	PMB	1-Nov-22	Shorewide CI Service Contract QIR2 Phase IV Support Additional Budget Required	\$30,000	PCR-122	Nov-22	\$30,000	\$0.00	74	Hurricane Id Risks		Swenson
18	P018	10-Feb-23	1	PMB	29-Jan-24	QIR3 Phase IV Support Additional Budget Required	\$2,148,533	PCR-158	Jan-26	\$2,148,533	\$0.00	48, 55	Unanticipated Crew, Shore and Mandated Manning Costs		Swenson
19	P019	10-Feb-23	1	Draft	TBD	QIR3 Phase IV Support Additional Budget Required	\$826,352	TBD	TBD	TBD	\$0.00	48, 55	Unanticipated Crew, Shore and Mandated Manning Costs	230420 DS anticipate contract June 2024	Swenson
20	P021	17-May-23	1	PMB	6-Jul-23	PM 5 Month Delay to Match expected SY Delay	\$2,307,268	PCR-142	May-23	\$2,307,408	-\$140.31	41	Requirements Changes	Expect SY 5 month delay. Did not give relief or change SY activities, only added Proj MA	Bailey
21	P022	20-Nov-23	1	Draft	TBD	Underswater Acoustic Post Delivery Support 3 Vessels	\$99,000	TBD	TBD	TBD	\$0.00	11	Requirements Changes	Daryl has estimates	Swenson
22	Sched	2-Jan-24	1	Draft	TBD	IMS FC Extension	\$7,060,277	TBD	TBD	TBD	\$0.00	41	Shipyards Delay		All



Liens Monthly Report

- Project Monthly Financial Report to NSF includes:

- DRAFT Contingency Use Request (Liens) Log –
 - Only shows CURs that have not been submitted

CUR ID	Contingency Use Request Title	Change Level	Date Approved or Viewed by NSF	Month Added to PMB	Affected WBS	Schedule Contingency Impact (CO) and Balance	Estimated Change Value with F&A (negative puts \$ into contingency)	Projected Cumulative Deployed Contingency	Projected Contingency Balance	Projected Allocated Balance	Projected BAC	
S89	Benchmarks and MGC Foundation Upgrade V2 & V3 CO-89	3	20-Mar-23	TBD	R.02.01, R.03.01, R.01.01, R.02.01, R.03.01		\$51,250	\$38,642,337	\$20,808,878	\$20,808,878	\$370,667,973	
S90	Wet Lab Main Lab Door Sill Sealing	2	6-Jun-23	TBD	R.03.01	0	\$59,139	\$38,701,475	\$20,749,740	\$20,749,740	\$370,727,111	
S91	Crew Workshop Trailer Move CO-90	3	13-Jun-23	TBD	R.01.01	0	\$16,676	\$38,718,151	\$20,733,064	\$20,733,064	\$370,743,787	
S92	Fan Coil Control Obsolescence	3	22-Jun-23	TBD	R.01.01	0	\$24,560	\$38,742,711	\$20,708,504	\$20,708,504	\$370,768,347	
Approved Contingency Use Requests through July 13, 2023:							882	\$151,624	\$38,742,711	\$20,708,504	\$20,708,504	\$370,768,347

- Approved Contingency Use Request (Liens) Log
 - Only shows Approved CURs that have not been processed with a PCR into BAC yet.

CUR ID	Contingency Use Request Title	Change Level	Date Approved or Viewed by NSF	Month Added to PMB	Affected WBS	Schedule Contingency Impact (CO) and Balance	Estimated Change Value with F&A (negative puts \$ into contingency)	Projected Cumulative Deployed Contingency	Projected Contingency Balance	Projected Allocated Balance	Projected BAC	
P006	Sensor Opportunity USBL (Updated Jan 6, 2023)	1	Draft	TBD	TBD	0	\$1,076,775	\$39,815,486	\$19,631,729	\$19,631,729	\$371,845,122	
P008	Science Mission Expert Support	1	Draft	TBD	TBD	0	\$2,023,019	\$41,842,505	\$17,608,710	\$17,608,710	\$373,868,141	
P014	Post Delivery U-Tube Support	2	Draft	TBD	R.01.02.05, R.02.02.05, R.03.02.05	0	\$90,831	\$41,933,336	\$17,517,879	\$17,517,879	\$373,958,972	
P018	OIR2 Phase IV Support Additional Budget Required	1	Draft	TBD	TBD	0	\$2,168,142	\$44,101,478	\$15,349,737	\$15,349,737	\$376,127,114	
P019	OIR3 Phase IV Support Additional Budget Required	1	Draft	TBD	TBD	0	\$826,352	\$44,927,830	\$14,523,385	\$14,523,385	\$376,953,466	
Sched	Baseline vs Forecast Schedule Project Completion Date	1	Draft	TBD	TBD	20	\$470,800	\$45,398,630	\$14,052,585	\$14,052,585	\$377,424,266	
Drafted Contingency Use Requests through July 13, 2023:							20	\$6,655,919	\$45,398,630	\$14,052,585	\$14,052,585	\$377,424,266

- Retired in the last 6 Months

CUR ID	CUR Title	CUR Status	CUR Approval Date	CUR Level	Project Schedule Lien (Days)	Change Order Id	CUR Cost Lien	PCR Total \$	Comments	Shipped Change Order Staged Date	Corresponding PCR	PMB Implementation Month	Delta Adj + Rem Vs. CUR Approved Negative Is over CUR approved and Full. Positive Is Put to CUR Cost Lien	% Difference Cost Implemented Vs. CUR Cost Lien
S81	MGC Foundation Modifications	PMB	28-Sep-22	3	0	CO-83	\$8,180,000	\$12,110,361	V1: 11/06/22 V2: 11/08/22	8-Nov-22	PCR-124	Nov-22	-\$3,930.35	-48.00%
S84	Hurricane Ida Protest	PMB	8-Dec-22	1	0	CO-85	\$960,248.00	\$6,000	V1: 12/02/2022	20-Dec-22	PCR-128	Dec-22	-\$0.07	-0.00%
S83A	Entertainment Console and Shade	PMB	12-Jan-23	1	0	CO-86	\$35,036.00	\$30,846.32	V1:03/07/22 V2:03/07/22 V3:03/07/22	7-Mar-23	PCR-139	Mar-23	\$4,189.68	11.96%
S88	LED Lighting Cables COB8 5/2/2023 PCB-8	PMB	20-Jan-23	1	0	CO-88	\$147,645.00	\$122,964.57	V1:05/02/23 V2:05/02/23	2-May-23	PCR-143	May-23	\$24,680.43	16.72%
P007	OIR4 Phase IV Support Additional Budget Required	PMB	26-Jan-23	1	0	N/A	\$2,404,327	\$2,404,327	THO CUR	N/A	PCR-133	Feb-23	\$0.00	0.00%
P011	Switch Requirement Change	PMB	28-Jun-22	3	0	N/A	\$28,500	\$28,500	THO CUR	N/A	PCR-122	Nov-22	\$0.00	0.00%
P012	Cable Storage	PMB	27-Dec-22	3	0	N/A	\$32,400	\$32,400	THO CUR	N/A	PCR-123	Nov-22	\$0.00	0.00%
P013	Cable Infrastructure Market Forces Increase	PMB	26-Feb-23	1	0	N/A	\$369,278	\$369,278	THO CUR	N/A	PCR-134	Feb-23	\$0.00	0.00%
P015	Rain Gage Replacement	PMB	7-Oct-22	3	0	N/A	\$34,860	\$34,860	THO CUR	N/A	PCR-122	Nov-22	\$0.00	0.00%
P017	Shoreline CI Service Contract	PMB	1-Nov-22	3	0	N/A	\$30,000	\$30,000	THO CUR	N/A	PCR-122	Nov-22	\$0.00	0.00%
P021	PM 5 Month Delay to Match expected SY Delay	PMB		1	151	N/A	\$2,307,268	\$2,307,498	THO CUR	N/A	PCR-142	May-23	-\$140.31	-0.00%
Totals							151	\$6,357,742	\$5,372,695	Total Pull (-) or Put(+) from CAM Liens to Project Contingency:		\$25,080		



CUR Form

- CUR is a PDF form that routes in DocuSign:
- Created by CAMs
 - Identifies the following:
 - Drivers of Change
 - Purpose of Change
 - Cost Impact
 - Schedule Impact
 - Risk Realized or Retired
 - Approval Level
 - Signature
 - May include RCRV Scope and Decision Review Form
 - Level 1 CURs include PM Endorsement Letter

RCRV Contingency Use Request Form

Change ID# 004 **Title** RCRV Custom-Built_CTD_Frame
Date 6/7/19 **Phase** 4- Transition to Op **POC** Daryl Swenson
Change Level 1 **Grant From** S8998A **SWBS**

RISK ID	WBS DESCRIPTION	OSU Index	Cost (Lien)	Sched (days)	Wgt (lbs)	KG (lb)
11.04.1.2.1	Requirements Changes V1-T-C	8888 Contingency V1 T-OP	\$ 113,333			
11.05.2.2.5	Requirements Changes V2-T-C	8888 Contingency V2 T-OP	\$ 113,333			
11.06.3.2.7	Requirements Changes V3-T-C	8888 Contingency V3 T-OP	\$ 113,333			
PM		8888 Contingency PM				
Change Drivers		Grand Total	\$ 340,000	Project Delay	0	days

Change Drivers

<input type="checkbox"/> Constructability	<input type="checkbox"/> Operational Requirements	Science Impact Moderate addition to major mission capability
<input checked="" type="checkbox"/> Design Flow	<input checked="" type="checkbox"/> Visual/Vibration Control	
<input checked="" type="checkbox"/> Improve Maintainability	<input type="checkbox"/> Visual Weight Control	Operational Costs Add minimally to lifetime costs
<input checked="" type="checkbox"/> Improve Operational Safety	<input type="checkbox"/> Logistics	
<input type="checkbox"/> Lower O&M Costs		
<input type="checkbox"/> Minimize Larger Impacts		

Purpose

During the Operating Institutions and the Science Oversight Committee's sensor procurement evaluations it was determined that the specified CTD frame produced by Sea-Bird Electronics (SBE) does not meet the requirements of modern operations and that it does not fit the needs for current and projected sensor mounting. Furthermore, it would not integrate well with the RCRV's LARS capabilities (make a custom frame). As a result, both groups requested that the program acquire a custom CTD frame that is designed for modern and future sensor mounting, integrates well with the LARS system that will be delivered with the vessel, and is made of a material that will allow for less maintenance.

How was this risk realized?

The specified CTD frame that was in the original scope was identified by the Operating Institutions and agreed on by the Science Oversight Committee to meet the program requirements specified for the program sensor suite. However, it was not used and replaced with the new frame. A new design was required to meet the LARS system requirements.

RCRV Contingency Use Request Form

Level 1 Change: \$30,000 **Level 2 Change: \$0.000-\$100,000** **Level 3 Change: \$100,000-\$500,000** **Level 4 Change: \$500,000-\$1,000,000**

If you are involved in documentation (i.e. updated project agreement) confirming the RCRV team is aware of and has identified funding sources to recover the project budget accordingly. By signing below, each authority is certifying that (s)he has reviewed the proposed use of contingency and has determined that it is the best use of his/her knowledge.

This contingency request is for a valid, critical risk and requires use of RCRV's contingency, and sponsor policies and instructions.

This contingency request is authorized, approved, or not approved for implementation by the appropriate authorities via checklist and subsequent signature.

This modification request requires the RCRV team to provide a risk management plan for the modification request. Sign the representation of these modifications to the request prior to the start of work, and upon review by other subject matter experts is returned based on his or her professional judgment, including, but not limited to:

- The RCRV Contingency Officer or Contingency Manager
- The RCRV Project Manager and Program Representative
- The Change Order Control Board

Additional or specific modifications for particular modifications are noted below in the "Additional Considerations" section below. Authorities are directed to use any concerns and to request advice in the "Comments" section.

Describe Impact of No Action

Vessel will be delivered with the originally scoped Sea-Bird CTD frame that is not certified for modern sensor mounting, will cause increased maintenance, increased personnel time, and will require an additional adapter to integrate with the LARS system.

ADDITIONAL CERTIFICATIONS	ENDORSE	APPROVE	SIGNATURE	COMMENTS	DATE
RCRV Project Manager/PM/Change Manager (Change > \$100,000)	Yes			Original budget underestimated the project requirements. This corrects that.	6/8/2020 12:07:22 PDT
Change Control Board (Change > \$100,000)	No			Requested CTD Frames are appropriate but not for use of contingency. It is appropriate to use the future.	6/10/2020 16:14:12 PDT
NSF Program Office (Change > \$100,000)		No			6/23/2020 12:33:28 PDT
NSF Grant Specialist			CC-40NSL		
NSF LARS Facilities Admin			CC-40NSL		



Project Change Requests (PCRs)

- Project Change Requests:
 - 161 PCRs to date
 - Level 1 12
 - Level 2 69
 - Level 3 58
 - Level 4 17
 - COVID 7
 - 9 PCRs add Schedule days
 - 87 PCRs did not change Project BAC
 - 76 PCR Changed Project BAC

PCR ID	PCR Description	Change Level	Date Approved or Viewed by NSF	Month Added to PMB	Affected WBS	Schedule Contingency Impact (C0) and Balance	PCR \$ added to BAC (negative puts \$ into contingency)	Cumulative Deployed Contingency	Contingency Balance	Obligated Contingency Balance	BAC
PCR-000	STARTING VALUES		3-Jul-17	3-Jul-17		293			\$55,974,000.00	\$15,000,000.00	\$79,000,938.00
PCR-125	TTO PP Alignment and PP to WP	3	10-Jan-22	Dec-22	R.02.01, R.03.01	0	\$0.00	\$32,599,626.71	\$26,851,588.29	\$26,851,588.29	\$364,625,262.71
PCR-126	PFO move PPs	2	10-Jan-22	Dec-22	R.02.01, R.03.01	0	\$0.00	\$32,599,626.71	\$26,851,588.29	\$26,851,588.29	\$364,625,262.71
PCR-127	TTO Close S8504A OI#1 Ph IIIa	2	10-Jan-22	Dec-22	R.02.01, R.03.01	0	\$0.00	\$32,599,626.71	\$26,851,588.29	\$26,851,588.29	\$364,625,262.71
PCR-128	PFO SY CO 85 and Dec 2022 ME	2	10-Jan-22	Dec-22	R.02.01, R.03.01	0	\$960,248.07	\$33,559,874.78	\$25,891,340.22	\$25,891,340.22	\$365,585,510.78
PCR-129	TTO Admin Change to remove unnessary P6 Activities	4	16-Jan-23	Jan-23	R.01.01, R.02.01, R.03.01	0	\$0.00	\$33,559,874.78	\$25,891,340.22	\$25,891,340.22	\$365,585,510.78
PCR-130	PFO Glisten Amendment	3	20-Jan-23	Jan-23	R.01.01, R.02.01, R.03.01	0	\$0.00	\$33,559,874.78	\$25,891,340.22	\$25,891,340.22	\$365,585,510.78
PCR-131	PFO January 2023 SY ME	3	5-Mar-23	Jan-23	R.01.01, R.02.01, R.03.01	0	\$0.00	\$33,559,874.78	\$25,891,340.22	\$25,891,340.22	\$365,585,510.78
PCR-132	TTO Remove Pier Electric Budget	2	15-Mar-23	Feb-23	R.01.02.04.01	0	-\$210,000.00	\$33,349,874.78	\$26,101,340.22	\$26,101,340.22	\$365,375,510.78
PCR-133	TTO OI1 Ph IV Support CUR P007	2	15-Mar-23	Feb-23	R.01.02.04.01	0	\$2,404,327.00	\$35,754,201.78	\$23,697,013.22	\$23,697,013.22	\$367,779,837.78
PCR-134	TTO CUR P013 CI Equipment V2 & V3	2	16-Mar-23	Feb-23	R.02.02.01, R.03.02.01	0	\$369,278.00	\$36,123,479.78	\$23,327,735.22	\$23,327,735.22	\$368,149,115.78
PCR-135	TTO PP to WP V1 Shipboard Entertainment System	3	20-Mar-23	Feb-23	R.01.02.06.03	0	\$0.00	\$36,123,479.78	\$23,327,735.22	\$23,327,735.22	\$368,149,115.78
PCR-136	PFO SY Feb 2023 ME BL Changes	3	7-Apr-23	Feb-23	R.01.01, R.02.01, R.03.01	0	\$0.00	\$36,123,479.78	\$23,327,735.22	\$23,327,735.22	\$368,149,115.78
PCR-137	PFO Amendment 3 Restated Shipyard Contract	2	11-Apr-23	Mar-23	R.01.01, R.02.01, R.03.01	0	\$0.00	\$36,123,479.78	\$23,327,735.22	\$23,327,735.22	\$368,149,115.78
PCR-138	TTO PP and WP Budget and Time Phasing Adjustments	3	1-May-23	Mar-23	R.01.02, R.02.02, R.03.02	0	\$0.00	\$36,123,479.78	\$23,327,735.22	\$23,327,735.22	\$368,149,115.78
PCR-139	PFO SY Mar '23 Sch Changes & CO-86 Entertainment Console and Shade	3	12-May-23	Mar-23	R.01.01, R.02.01, R.03.01	0	\$30,846.32	\$36,154,326.10	\$23,296,888.90	\$23,296,888.90	\$368,179,962.10
PCR-140	PFO SY Apr '23 Sch Changes & CO-87 UT Tank Access	3	12-May-23	Apr-23	R.01.01, R.02.01, R.03.01	0	\$6,384.57	\$36,160,710.67	\$23,290,504.33	\$23,290,504.33	\$368,186,346.67
PCR-141	TTO Personnel Vans Amendment 1	3	13-Jun-23	May-23	R.01.01, R.02.01, R.03.01	0	\$0.00	\$36,160,710.67	\$23,290,504.33	\$23,290,504.33	\$368,186,346.67
PCR-142	PM 5 Month Delay Project Completion (L1 CUR-P021)	2	14-Jul-23	May-23	R.01.01, R.02.01, R.03.01	0	\$2,307,408.31	\$38,468,118.98	\$20,983,096.02	\$20,983,096.02	\$370,491,754.98
PCR-143	PFO SY May '23 Sch Changes & CO-88	2	15-Jul-23	May-23	R.01.01, R.02.01, R.03.01	0	\$122,967.69	\$38,591,086.67	\$20,860,128.33	\$20,860,128.33	\$370,616,722.67
PCR Log Totals:						892	\$6,150,530.38	\$38,591,086.67	\$20,860,128.33	\$20,860,128.33	\$370,616,722.67



Monthly Financial Report Summary Tables

- EVMS Status Summary Table

RCRV Status:	\$M
EVM as of:	May-23
Total Project Cost (Three vessels)	\$391.5
Planned Value	\$246.7
Earned Value	\$210.4
Actual Cost	\$208.5
CPI	1.01
SPI	0.85
Funding To-Date (MREFC)	\$391.5
% Complete	56.78%
% Spent	56.24%
Budget at Completion (BAC)	\$370.6
Estimate at Completion (EAC)	\$368.6
EAC = AC+BAC-EV	\$368.6
EAC = AC+((BAC-EV)/(CPI*SPI))	\$395.0
Cost Variance (CV)	\$2.0
Schedule Variance (SV)	-\$36.3
Contingency Balance against Allocated	\$20.9
Contingency Balance against Budget	\$20.9
Estimate to Complete (ETC)	\$160.2
Contingency % of Estimate to Complete (ETC)	13.02%

- Contingency Summary

- Changes Implemented in PMB
 - Implemented with Approved PCRs
 - Part of BAC
 - Risk Realized or Retired
- Approved and Drafted Liens
 - In Lien Account
 - In Risk Register (evaluated every 3 months)

Contingency Summary					
	Schedule Calendar Days	Approved Contingency	NSF Obligated Contingency	Contingency Balance / ETC	Balance / Starting BAC*
Starting Contingency Value	489	\$55,974,000	\$55,974,000		18.78%
CSA Amend 13 Added Contingency*	0	\$3,477,215	\$3,477,215		17.41%
Total Contingency Value	489	\$59,451,215	\$59,451,215		
Changes implemented in PMB	882	\$38,591,087			
Before Liens and Draft CURs Contingency Value	0	\$20,860,128		12.648%	
Estimate of Approved Liens	0	\$151,624		0.092%	
Estimate of Drafted CURs	0	\$6,655,919		4.036%	
Available Contingency	0	\$14,052,585		8.520%	



PCR Form Page 1

• PCR Form Page 1

- Check Boxes for Categories and Actions
- Description is justification and actions for OSU Grants and Finance Offices.



RCRV Project Change Request



Date:	04/28/2023	PCR Number:	PCR-138																																
Requestor:	Daryl Swensen	Prepared By:	Rich Grubb																																
CR Title:	TtO PP and WP Budget and Time Phasing Adjustments																																		
WBS(s):	R.01.02, R.02.02, R.03.02	Needed By:	05/01/2023																																
Contract Award No:	<input checked="" type="checkbox"/> Governing Cooperative Agreement: 1333564																																		
Associated Risk:																																			
Reason for Change Request (Check All That Apply by Clicking on the Box)																																			
Technical Change <input type="checkbox"/> CD change only <input type="checkbox"/> Change to baseline <input type="checkbox"/> New work scope <input type="checkbox"/> Adjustment or correction to details <input type="checkbox"/> Re-negotiated subcontract activity <input type="checkbox"/> Other:		Schedule Change <input type="checkbox"/> Level 1 Milestone <input type="checkbox"/> Level 2 Milestone <input type="checkbox"/> Level 3 Milestone <input checked="" type="checkbox"/> Proposed re-baseline of detailed activities <input type="checkbox"/> Slip in schedule: <input type="checkbox"/> Gain in schedule: <input type="checkbox"/> Other:																																	
Administrative Change <input type="checkbox"/> Administrative change only		Budget Change <input checked="" type="checkbox"/> Transfer of budget from one WBS Element or Work Package to another <input type="checkbox"/> Transfer of budget to contingency <input type="checkbox"/> Transfer of budget from Lien <input type="checkbox"/> Request budget from contingency <input type="checkbox"/> Adjustment of budget with current month or next month. <input type="checkbox"/> Hurricane Ida MR <input type="checkbox"/> Increase Budget: \$ 0.00 <input type="checkbox"/> Decrease Budget: \$ 0.00																																	
Desc:	<p>The purpose of this Level 3 PCR is to implement Budget and Time Phasing Adjustments to TtO Work Package The following 1-5 are the Work Package Budget Changes (All values include F&A):</p> <ol style="list-style-type: none"> 1. S8501F V1 T Sensor Expert Support - Close Work Package adjust balance to equal actuals. Budget was \$40,500.00 now is \$36,981.90. Delta moves to WP S8503B and PP S85051. 2. S8503B T R-DESC Spares - Close Work Package adjust budget to equal actuals Budget was \$418,034.85 now is \$418,279.99. Delta from S8501F 3. S8501G V1 T PHD Flow Supplies - Close Work Package adjust budget to equal actuals 4. Budget was \$16,470.00 now is \$14,844.00. Delta to S8503A (OSU is confirming the Edmonds Credit Value May have to adjust next month) 5. S8503A V1 T R-DESC WP - Add Budget from Work Package S8501G Budget was \$111,400.00 is now \$113,025.20 <p>Schedule Changes 6-8 (only changes time phasing of budget):</p> <ol style="list-style-type: none"> 6. Move WPs & PPs out in schedule because of SY delay to keep planned value from being in the past: S85011V1 T Cyber and Sensor Infrastructure Planning Package, S8502A V1 T Glostoen Core Pacyderrm S85041 V1 OI#1 Phase IV Planning Package, S85061 V1 T Other Transition Support Contracts-Procure S8602A V2 T Glostoen Post Outfit Support, S87021 V2 T Outfitting Equipment Planning Package, S8702 S8502A Create new activity, "A4GL.2750 Glostoen Tran to Ops. - Design Tasks Directed by OSU 2023", \$6 Glostoen Tran to Ops. - Design Tasks Directed by OSU PP Activity" in same work package) 7. S8502A Create new activity, "A4GL.2750 Glostoen Tran to Ops. - Design Tasks Directed by OSU 2023", \$6 Glostoen Tran to Ops. - Design Tasks Directed by OSU PP Activity" in same work package) 8. Deleted some of the activities in the procurement processes because these are ongoing multiple orders. T <p>Attachments: COBRA Before and After Compare WPs & PPs, Budget Time Phasing (5 pages) P6 Critical Path did not change and is not provided P6 Before and After Compare shows affect work package activities (5 pages)</p>																																		
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PCR Form Page 2

- PCR Form Page 2
 - Contingency Impact
 - Approval Level Required
 - Signatures Required
 - Applicable Prior Approved CURs

Summary of Contingency Impact by Fund Source:		RCRV PMCS Change Request																																						
Contingency adjustment:		<table border="1"> <thead> <tr> <th></th> <th>Previous \$</th> <th>PCR \$</th> <th>Current \$</th> </tr> </thead> <tbody> <tr> <td>MREFC</td> <td>\$ 368,140,116</td> <td>\$ 0</td> <td>\$ 368,140,116</td> </tr> </tbody> </table>				Previous \$	PCR \$	Current \$	MREFC	\$ 368,140,116	\$ 0	\$ 368,140,116																												
	Previous \$	PCR \$	Current \$																																					
MREFC	\$ 368,140,116	\$ 0	\$ 368,140,116																																					
Time Phased Budget Spread by Work Package:		Financial Data Month PCR Implemented into PMB March-2023																																						
Impact if PCR Not Approved:		See supporting spreadsheet See Cobra compare PDF attachment																																						
Impact if PCR Not Approved:		IMS/PMB would have mismatch to closed WP values. Also Planning Packages would have been in the past starting in March of 2023 if we did not move them out into the future.																																						
CR Approvals:		<table border="0"> <tr> <td colspan="2">DecuSigned by: <u>Daryl Swensen</u></td> <td colspan="2">DecuSigned by: <u>Rich Grubb</u></td> </tr> <tr> <td colspan="2">Date: 4/28/2023 15:25:39 PDT</td> <td colspan="2">Date: 4/28/2023 15:30:56 PDT</td> </tr> <tr> <td colspan="2">CAM1: Daryl Swensen</td> <td colspan="2">Project Controls: <u>Rich Grubb</u></td> </tr> <tr> <td colspan="2">CAM2:</td> <td colspan="2">Project Managr: <u>Demian Bailey</u></td> </tr> <tr> <td colspan="2">Date:</td> <td colspan="2">Date: 5/1/2023 12:13:31 PDT</td> </tr> <tr> <td colspan="2">CAM3:</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Date:</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">CAM4:</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Date:</td> <td colspan="2"></td> </tr> </table>			DecuSigned by: <u>Daryl Swensen</u>		DecuSigned by: <u>Rich Grubb</u>		Date: 4/28/2023 15:25:39 PDT		Date: 4/28/2023 15:30:56 PDT		CAM1: Daryl Swensen		Project Controls: <u>Rich Grubb</u>		CAM2:		Project Managr: <u>Demian Bailey</u>		Date:		Date: 5/1/2023 12:13:31 PDT		CAM3:				Date:				CAM4:				Date:			
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NSF CUR Approvals:		N/A																																						
Level 1 Change Not Requiring CUR		Level 1 Change (If needed) NSF Program Officer: <u>Brian Midson</u> CCB: Date: Date:																																						



PCR Form Cobra Before and After Time Phasing

- PCR Form Cobra Before and After Time Phasing
 - Page 5 of 5 of the Form shows the annual shift of budget the change caused at level 3 of the WBS.

Annual Budget Time Phasing Changes: PCR-138 - PCR-137

R.01 - Vessel 1 (V1)	2017	2018	2019	2020	2021	2022	2023	2024	2025	Grand Total
R.01.01 - V1 Phase III - Construction and Delivery	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.01.02 - V1 Phase IV - Transition to Operations (TtO)	\$0	\$0	\$0	\$0	\$0	\$0	-\$265,809	\$265,809	\$0	\$0
R.02 - Vessel 2 (V2)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.02.01 - V2 Phase III - Construction and Delivery	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.02.02 - V2 Phase IV - Transition to Operations (TtO)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.03 - Vessel 3 (V3)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$860	\$860
R.03.01 - V3 Phase III - Construction and Delivery	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.03.02 - V3 Phase IV - Transition to Operations (TtO)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$860	\$860	\$0
R.04 - RCRV Project Management	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.04.01 - PEP Management	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.04.02 - Travel	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.04.03 - Project Office Supplies & Minor Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.04.04 - Education and Public Outreach	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
R.04.05 - Project Management Consulting Services	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Grand Total	\$0	\$0	\$0	\$0	\$0	\$0	-\$265,809	\$264,949	\$860	\$0

- The excel file that generates the table for the form also has a sheet that shows the month by month change to budget by WP/PP.
 - This sheet is where we verify Planned Value in the past is not changing.



PCR Form P6 Schedule Before and After

• PCR Form P6 Schedule Before and After

- Shows delta in budget value, start and finish date moves, duration changes.

PCR-138 RCRV Phase II/IV - IMS Feb 2023 BL										RCRV PCR Before (BF) and After Gantt										28-Apr-23 13:00														
#	Task/Activity ID	Activity Name	RCRV PCR/Notes New	BF Duration	Duration W/Cs	Duration var to BF	BF Start	BF End	Start	End	BF Finish	Finish	BF Budgeted Cost	Budgeted Cost	1 Delta BF - Now	Activity Count	RCRV PCR	2021	2022	2023	Gantt Chart													
1	Total			1500	1517	-17	01-Apr-19	01-Apr-19	0	13-Mar-25	01-Apr-25	-17	146	\$4,362,302.73	\$4,362,302.73	\$0.00	94				[Gantt bars for Total]													
2	Daryl Swanson			802	837	-35	26-May-21	26-May-21	0	31-Jul-24	19-Sep-24	-35	1	\$620,047.29	\$616,029.19	\$3,518.10	15				[Gantt bars for Daryl Swanson]													
3	R.BL.01.02.01 V1 TIO Cyber and Sensor Infrastructure Package			347	262	85	20-Mar-23	07-Sep-23	-120	31-Jul-24	19-Sep-24	-35	1	\$579,547.29	\$579,547.29	\$0.00	4				[Gantt bars for R.BL.01.02.01 V1 TIO Cyber and Sensor Infrastructure Package]													
4	SA0011 V1 T Cyber and Sensor Infrastructure Package			72	72	0	25-Sep-23	25-Sep-23	0	09-Jan-24	09-Jan-24	0	179	\$15,854.91	\$15,854.91	\$0.00	1	SER011	PCR-138				[Gantt bars for SA0011 V1 T Cyber and Sensor Infrastructure Package]											
5	AACY2612 Cyber Consultations - Leadtime Wireless Survey V1		PCR-138 Move out 9' Delay	280	262	18	20-Mar-23	07-Sep-23	-120	25-Apr-24	19-Sep-24	-102	1	\$37,465.47	\$37,465.47	\$0.00	1	SER011	PCR-138				[Gantt bars for AACY2612 Cyber Consultations - Leadtime Wireless Survey V1]											
6	ACY261250 Cyber Consultations - Leadtime Security Consultant V1		PCR-138 Move out 9' Delay	343	262	81	24-Mar-23	07-Sep-23	-136	31-Jul-24	19-Sep-24	-35	1	\$486,661.24	\$486,661.24	\$0.00	1	SER011	PCR-138				[Gantt bars for ACY261250 Cyber Consultations - Leadtime Security Consultant V1]											
7	AACY2670 Cyber Services - Leadtime Vessel 1		PCR-138 Move out 9' Delay	280	262	18	20-Mar-23	07-Sep-23	-120	25-Apr-24	19-Sep-24	-102	1	\$29,565.67	\$29,565.67	\$0.00	1	SER011	PCR-138				[Gantt bars for AACY2670 Cyber Services - Leadtime Vessel 1]											
8	AACY2780 Cyber Consultations - Leadtime Vessel 1 PP Placeholder		PCR-138 Move out 9' Delay	442	450	-8	26-May-21	26-May-21	0	28-Feb-23	10-Mar-23	-8	158	\$40,500.00	\$36,981.90	\$3,518.10	3				[Gantt bars for AACY2780 Cyber Consultations - Leadtime Vessel 1 PP Placeholder]													
	Sensor Expert Support		PCR-138 No Change	252	252	0	26-May-21	26-May-21	0	25-May-22	25-May-22	0	226	\$20,250.00	\$20,250.00	\$0.00	1	SER01F	PCR-138				[Gantt bars for Sensor Expert Support]											
	Sensor Suite - Sensor Export Support		PCR-138 No Change	122	122	0	01-Sep-22	01-Sep-22*	0	28-Feb-23	28-Feb-23	0	158	\$20,250.00	\$20,250.00	\$0.00	1	SER01F	PCR-138				[Gantt bars for Sensor Suite - Sensor Export Support]											
	Sensor Suite - Sensor Export Support Extend		PCR-138 New Activity CTR. Close WP move remaining budget to SA0018 and SA0051	0	8	-8	01-Mar-23			10-Mar-23		158	\$0.00	\$3,518.10	\$3,518.10	\$0.00	1	SER01F	PCR-138				[Gantt bars for Sensor Suite - Sensor Export Support Extend]											
	WP			453	573	-120	28-May-21	28-May-21	0	17-Mar-23	06-Sep-23	-120	191	\$0.00	\$0.00	\$0.00	8				[Gantt bars for WP]													
	Cyber Consultations - Transition Prep Wireless Survey		PCR-138 Move out 9' Delay	237	377	-140	19-Nov-21	19-Nov-21*	0	27-Oct-22	19-May-23	-140	196	\$0.00	\$0.00	\$0.00	1	PCR-138				[Gantt bars for Cyber Consultations - Transition Prep Wireless Survey]												
	Cyber Consultations - Procurement Planning Wireless Survey		PCR-138 Move out 9' Delay	30	30	0	28-Oct-22	23-May-23	-140	13-Dec-22	03-Jul-23	-140	196	\$0.00	\$0.00	\$0.00	1	PCR-138				[Gantt bars for Cyber Consultations - Procurement Planning Wireless Survey]												
	Cyber Consultations - Vendor Selections Wireless Survey		PCR-138 Move out 9' Delay	40	40	0	14-Dec-22	05-Jul-23	-140	10-Feb-23	29-Aug-23	-140	196	\$0.00	\$0.00	\$0.00	1	PCR-138				[Gantt bars for Cyber Consultations - Vendor Selections Wireless Survey]												
	Cyber Consultations - Contract Award Wireless Survey		PCR-138 Move out 9' Delay	0	0	0			-140	10-Feb-23	29-Aug-23	-140	196	\$0.00	\$0.00	\$0.00	1	PCR-138				[Gantt bars for Cyber Consultations - Contract Award Wireless Survey]												
	Cyber Consultations - Transition Prep All Vessels Security Consultant		PCR-138 Move out 9' Delay	378	498	-120	28-May-21	28-May-21	0	29-Nov-22	19-May-23	-120	1	\$0.00	\$0.00	\$0.00	1	PCR-138				[Gantt bars for Cyber Consultations - Transition Prep All Vessels Security Consultant]												
	Cyber Consultations - Procurement Planning All Vessels Security Consultant		PCR-138 Move out 9' Delay	35	35	0	30-Nov-22	22-May-23	-120	20-Jan-23	11-Jul-23	-120	1	\$0.00	\$0.00	\$0.00	1	PCR-138				[Gantt bars for Cyber Consultations - Procurement Planning All Vessels Security Consultant]												
	Cyber Consultations - Vendor Selections All Vessels/Security Consultant		PCR-138 Move out 9' Delay	40	40	0	23-Jan-23	12-Jul-23	-120	17-Mar-23	06-Sep-23	-120	1	\$0.00	\$0.00	\$0.00	1	PCR-138				[Gantt bars for Cyber Consultations - Vendor Selections All Vessels/Security Consultant]												
	Cyber Consultations - Contract Award All Vessels Security Consultant		PCR-138 Move out 9' Delay	0	0	0			-120	17-Mar-23	06-Sep-23	-120	1	\$0.00	\$0.00	\$0.00	1	PCR-138				[Gantt bars for Cyber Consultations - Contract Award All Vessels Security Consultant]												
	V TIO Globcon: Phase IV Contract			1216	1277	-61	01-Apr-19	01-Apr-19	0	29-Jan-24	23-Apr-24	-61	97	\$346,370.11	\$346,370.11	\$0.00	8				[Gantt bars for V TIO Globcon: Phase IV Contract]													
	Estimote Pro P3000			117	117	0	01-Apr-19	01-Apr-19	0	29-Jan-24	23-Apr-24	-61	97	\$346,370.11	\$346,370.11	\$0.00	8				[Gantt bars for Estimote Pro P3000]													
	Glostom Tran to Ops - FY19		PCR-138 No Change	48	48	0	01-Apr-19	01-Apr-19	0	13-Sep-19	13-Sep-19	0	552	\$28,888.53	\$28,888.53	\$0.00	1	SER02A	PCR-138				[Gantt bars for Glostom Tran to Ops - FY19]											
	Glostom Tran to Ops - Design Tasks Directed by OSU Fall FY19		PCR-138 No Change	48	48	0	12-Dec-19	12-Dec-19	0	20-Feb-20	20-Feb-20	0	552	\$62,010.19	\$62,010.19	\$0.00	1	SER02A	PCR-138				[Gantt bars for Glostom Tran to Ops - Design Tasks Directed by OSU Fall FY19]											
	Glostom Tran to Ops - Design Tasks Directed by OSU April 2020		PCR-138 No Change	15	15	0	06-Apr-20	06-Apr-20*	0	24-Apr-20	24-Apr-20	0	521	\$20,440.00	\$20,440.00	\$0.00	1	SER02A	PCR-138				[Gantt bars for Glostom Tran to Ops - Design Tasks Directed by OSU April 2020]											





Questions /Comments