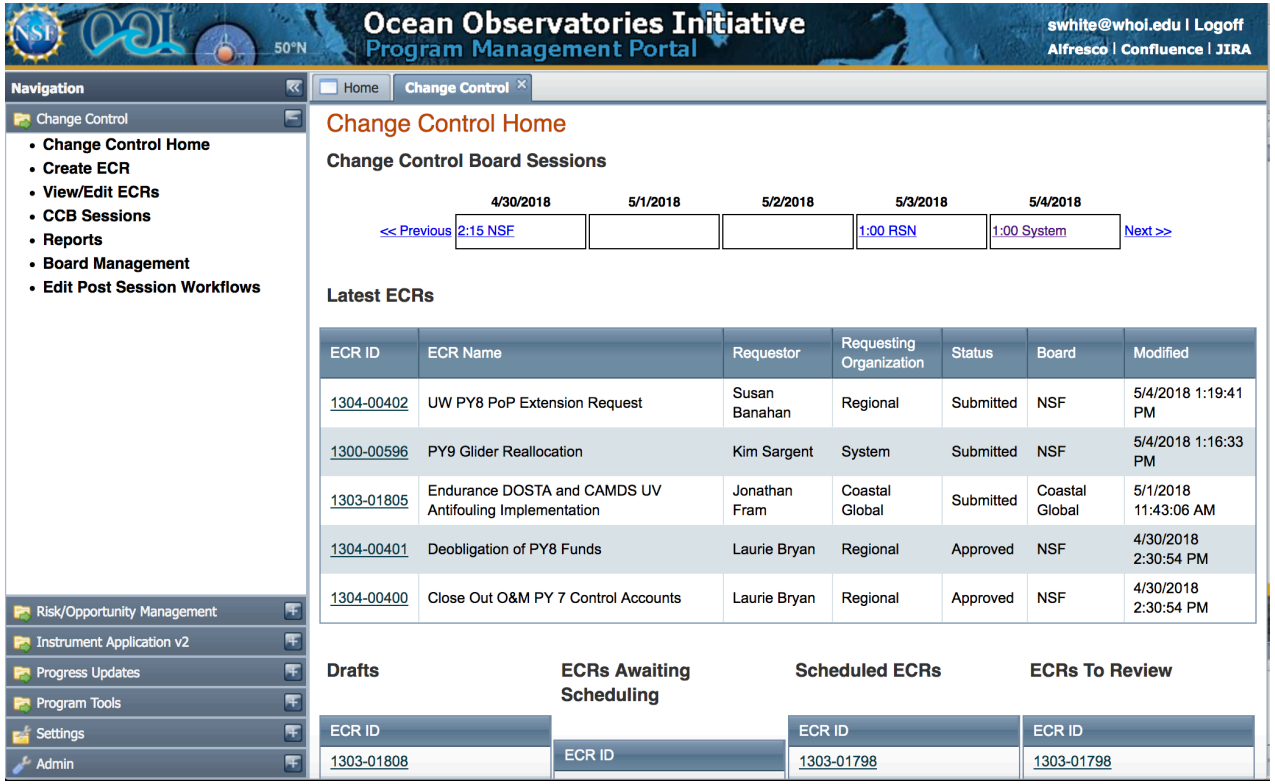
OOI Change Control (ECR) Process

OCEAN OBSERVATORIES INITIATIVE

OOI Change Control

- 1000-00000 Configuration Management Plan
- Custom software used for the change control process
  - Create Engineering Change Requests
  - Submit/schedule for Change Control Board
  - Review ECR
  - Vote and complete or push to next board



Engineering Change Requests (ECRs)

- Numbering by SAF (per the CMP)
- 130X-xxxxx
  - X=0 OOI System
  - X=1 PMO
  - X=2 CI
  - X=3 CGSN/EA
  - X=4 RSN
  - X=5 EPE (not used)
  - X=8 EA (not used)

- Class 1 ECRs
  - Can start at any level but must go to System (maybe NSF) for final approval
  - Schedule changes of more than $25k between control accounts
  - Scheduled changes of more than 60 days
  - Cross IO, science impacts
- Class 2 ECRs
  - Final approval at the MIO level

Engineering Change Requests (ECRs)

Engineering Change Request Form

Change Request No.:	**Date:**	**WBS:**
1300-00561	3/23/2017	
Control Account Name: None	**Configuration Manager:** Carr, Kathy	**Control Account Manager:**
SECTION TO BE COMPLETED BY PERSON REQUESTING CHANGE:		
Requestor: Sheri White	**Telephone Number:** (508) 289-3740	
Request Name (Include document number and revision level): Proposed NUTNR-B Model change from ISUS to SUNA		

Description of Change (Include all related systems):
Change the model of the NUTNR-B nitrate instrument from the Satlantic ISUS to the Satlantic/Sea-Bird SUNA. We will move from the ISUS instrument with external battery pack and either the copper foul guard or pump for bio-fouling mitigation, to the SUNA without a battery pack and a wiper brush for bio-fouling mitigation.

The Class and Series, and hence the Reference Designators would remain the same to ensure continuity of data in the CI OOINet system (per discussions with the CI Data Team).

Summary of instrument change:
• Make the same measurement using the same technique
• Same accuracy, similar range, SUNA uses shorter path length -> better precision & wider range; SUNA has less complex, more robust optics and electronics
• ISUS requires warm-up, SUNA does not
• Similar but not identical output streams, parser is available, DCL software development needed.
• SUNA is long and skinny relative to ISUS, new mounting bracketry required
• No change to deliverables for science

Science Impact –
This proposed change was submitted to and discussed by the OOI SOC to review the potential science impact. The SOC approved this proposed change from a science perspective.
(See attached Proposal submitted to the SOC: ISUS-SUNA_Swap_Proposal_2017-02-15.pdf)

Reason for Change:
In the Spring of 2011, OOI put out an RFP for dissolved Nitrate sensors. The contract was awarded to Satlantic, Inc. who proposed the ISUS and Deep SUNA instruments to meet the OOI Nitrate requirements for all platforms. The ISUS was proposed for the "fixed" instruments (Series B), and the Deep SUNA for the Cabled Array profilers (Series A). The SUNAs are also incorporated into the AUV (Series M), CSPP (Series J), and Global Profiling Gliders as a part of the Global Surface Piercing Profiler (GSPP) Plan B (Series N).

In 2011, Satlantic, WET Labs, and Sea-Bird Electronics (SBE) became the new entity Sea-Bird Scientific, and in 2017 all Satlantic instruments were transitioned to SBE and WET Labs. SBE is now producing the Satlantic nitrate instruments. We (the OOI Marine Implementing Organizations – MIOs) have been informed by Sea-Bird that the ISUS instrument is being discontinued and service will also be phasing out over time. They have recommended that we transition to the SUNA instrument. This will ensure we can continue to get instruments refurbished and recalibrated in a timely fashion.

Benefit to OOI:
This change will lead to commonality of instrumentation across the program – all nitrate sensors will be SUNAs. This change also heads off the upcoming obsolescence of the ISUS instrument.

The SUNA is smaller than the ISUS (which will open up more room for future expansion), and the SUNA's wiper brush has proven to be more successful at bio-fouling mitigation than the ISUS's copper foul guard or pump on OOI platforms. ISUS biofouling has been reported by MIOs in Redmine tickets 11390 and 9417. ISUS firmware failures have been reported in Redmine tickets 9428, 9427, and 9419. A summary of ISUS problems were reported in Redmine ticket 11627. There have been no reported problems with OOI SUNAs.

Requestor Assessment of Impact to Control Account:

Scope:
This proposed change affects WHOI and OSU (UW only uses the SUNA units). At present WHOI has 21 ISUS instruments and OSU has 13.

Actions related to implementation instrument integration:
1. MoN approval for procurement
2. Procurement of first round of instruments
3. Design of new clamps and mechanical integration
4. Development of data logger and update of Mooring PlatCon software
5. Procurement of remainder of instruments as funds become available.

Actions related to Data ingestion:
1. Update Interface Data Description (IDD) and all applicable instrument specification docs (DPS, etc.) in Confluence (MIO and CI Developers)
2. Update 1100-0006 Vocabulary & Reference designator Spreadsheet in Alfresco (MIO and Data Team)
3. Add new Cassandra tables for instrument data particles (CI Developer)
4. Update Preload Database Repo (CI Developer)
5. Code Parser (in this case, based on existing Cabled Instrument Agent Driver; CI Developer)
6. Code Dataset Agent (CI Developer)
7. Code unit tests for Dataset Agent (CI Developer)
8. Code Review (CI Developer)
9. Testing new code (CI Developer and MIO)
10. Work with Data Team to verify accuracy of new data particles produced (CI Developer, MIO, and Data Team)

Schedule:
We propose WHOI and OSU transitioning to the SUNA units over the 2017-2018 time frame.

First deployment of the SUNA as a NUTNR-B would be on the Fall 2017 Pioneer Cruise if the units can be procured and the development can be completed in time. In 2018, all NUTNR-B instruments deployed at Pioneer, Endurance, and Global Arrays will be SUNAs.

Cost:
The cost of implementation is as follows:

This CGSN cost of $537,817.50 will be covered by rebudgetting 2016 underruns (see attached CGSN_From-To_Table). The rebudgetting from 2016 allows us to procure the initial units right away, and complete the NRE early in 2017 to allow for first deployments in Fall 2017.

The EA cost of $318,077.50 will be coverd by rebudgetting underruns, such as those related to vendor servicing of ADCP, VEL3D, VELPT, CAMDS, and NUTNR. This ECR does not move any EA budget at this time. A future ECR will move the funds later in the year when underruns are realized.

SECTION TO BE COMPLETED BY IO/SL CCB CHAIRPERSON:

Assessment of Impact to IO Project:

Master Schedule:

Project Cost:

Deliverables:

Potential Impact to Science and Design / As-built Capability:

Percent Impact on WBS elements(s) selected: 0%	**Percent Impact on OOI:** 0%	
Contingency $0	**Contingency Schedule (weeks):** 0	
Signature of System CCB Chairperson: Mike Kelly (jkelly@oceanleadership.org)	**Date:** 4/13/2017 2:00:00 PM	**Board Determination:** Approved
Signature of NSF CCB Chairperson: Bauke Houtman (bhoutman@nsf.gov)	**Date:** 4/24/2017 3:40:00 PM	**Board Determination:** Approved
CERTIFICATION OF TECHNICAL DATA PACKAGE AND CONTROL SYSTEM UPDATE		

Change Control Boards

- PMO/IO Level
  - Chair: Lead Systems Engineer
  - MIO membership
    - PM
    - PS
    - Leads
    - Ops
- OOI System Level
  - Chair: Lead Systems Engineer
  - Members: PMO/IO representation
    - PMs/PIs
    - SEs
    - PSes
    - Quality/Safety/Ops
- NSF Level
  - NSF Program Managers