Pathway for new sensors and parameters to enter Argo

Argo wants to encourage where appropriate the development of
- new sensors for presently accepted parameters,
- new sensors for new parameters.

Argo recognizes that sometimes the most effective way to do this is by mounting experimental sensors on floats that are also contributing to Argo.

Recall that for floats that are part of Argo (notified at AIC) , **ALL** measurements must be made publicly available, including experimental ones.

In order to manage the progress of sensors from experimental to fully approved, Argo considers new sensors and parameters to be in one of three stages:

Approved: An approved sensor is well characterized in terms of performance, with good understanding of accuracy and a well-defined data quality control path. **Approved** sensors appear in the Argo Reference Tables for the sensor description and parameters measured.

Pilot: When a sensor has been developed, for either an existing approved parameter, or to measure a new parameter, and an investigator considers that there is a good chance that the new technology could be deployed in significant numbers with wide geographic coverage, then the measurement can be proposed for **pilot** deployments.

The AST and ADMT will consider whether the new measurements are on a reasonable development path in terms of engineering and data management.

If pilot status is agreed, then the sensor description and parameters will be added to the Argo Reference Tables.
Data from pilot sensors can then be stored in Argo NetCDF files in the main "dac" data directory.

"Approved" and "**Pilot"** measurements are "**Accepted**" by the Argo data system

Experimental: When a sensor is not yet ready for pilot status, it may be mounted on a float making other Approved or Pilot measurements.

Experimental sensors are **NOT** added to the Argo Reference Tables
Experimental parameters are **NOT** added to the Argo Reference Tables
until in each case they are agreed by AST and ADMT and reach **Pilot** status.

The data from Experimental sensors must be made available at GDAC level, but cannot be included in the Argo NetCDF files.

Experimental data are placed in the "aux" directory in PI-supplied files and formats. The PI is responsible for describing the files and answering queries.

When is a float an Argo float ? (A: When it is notified to AIC !)

At a minimum, Argo floats should measure temperature, salinity and pressure every 10 days to 2000db, parking at 1000db (where possible) between profiles using '**Accepted**' sensors

Floats may carry **Accepted** Argo sensors as identified in the Argo Reference Tables, and measure **Accepted** Argo parameters

For these 'Argo parameters' there are general requirements related to data quality and management that must be met.

At present (November 2017) The only **approved** CTD is the SBE41 deployed down to 2000 dbar. The SBE61, SBE41 deployed deeper than 2000 dbar, and RBR CTDs have been accepted in pilot mode.

QC flag for pilot measurements

Data from sensors with **Pilot** status should assign a real-time QC flag of 3.

That flag could be reassigned in delayed-mode, if the Argo data system agrees that the data are good.

Proposal: Those sensors could be added to the greylist, which will automatically assign a QC=3 and ensure they do not go to GTS. This will use existing machinery and put minimum burden on the DACs.

Notification to AIC

Floats that make at least some **Accepted** (ie Pilot or Approved) Argo measurements **should be notified to AIC** on deployment if they are a contribution to Argo. Data for **Accepted** parameters from **Accepted** sensors go in the dac directory.

If a float makes only **Experimental** measurements, it cannot be part of Argo. It **MUST NOT** be notified to AIC. There are no Argo NetCDF files and the measurements cannot be included in the Argo data system, not even in AUX. These are research floats and must be managed by the PI as Marine Scientific Research.

Experimental and Pilot CTDs

If a float carries an **Experimental** CTD, then it can only be part of Argo if it **also** carries an **Accepted** CTD.

Data from the **Accepted** CTD will be in the ‘dac’ directory; Data from the **Experimental** CTD will be in the ‘aux’ directory.

If a float carries a Pilot and Approved CTD, the data from the **Approved** sensor will populate the PRES, TEMP, PSAL parameters.

In order to include **Pilot** or **Experimental** measurements in Argo, a path must exist to make all data from an Argo float, including **Experimental** parameters, publically and transparently available.

This distribution of **Experimental** or **Pilot** data should be achieved in a way to minimize the burden on the Argo Data Management Team.

To facilitate this Argo has formed an auxiliary directory at the Argo GDACs that will distribute, but not curate this data.

If over time the **Experimental** sensors are shown to meet Argo's requirements (see below) or form part of a new global mission, a case for approval needs to be made to the AST and ADMT to include these into the Argo data stream as **Pilot** or **Approved** measurements.

Next steps

1) This proposal (a longer document) needs to be considered and endorsed by ADMT and AST

2) The core and BGC groups need to confirm which sensors and parameters are Approved, Pilot or Experimental

3) The Argo Reference Tables need to make it clear which sensors or parameters are Approved or Pilot

4) DACs and AST points of contact can now guide investigators about their duties and obligations if they want to contribute floats and measurements to Argo.