

ILRS OPERATION CENTERS CRD QUALITY CHECK UPGRADE

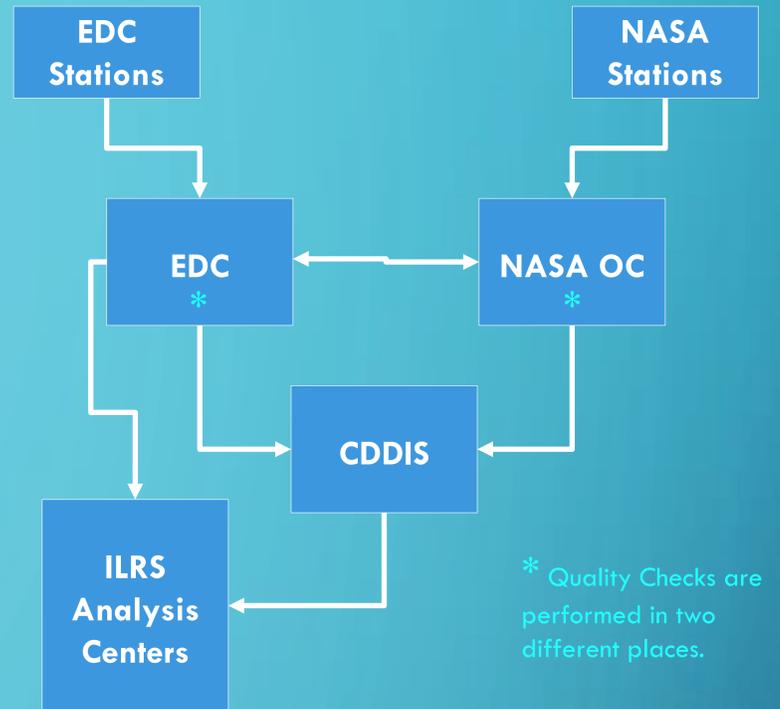
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What is this project about?

ILRS Operation Centers CRD Quality Check Upgrade Project Charter	
<p>Project Statement:</p> <p>The International Laser Ranging Service (ILRS) relies on two SLR Operations Centers (OC) to quality check and relay data to the ILRS Data Centers (DC). Although there is a standard format, there is no standard quality check (QC). Currently, the two OCs perform similar, but not identical QC. This can lead to discrepancies in the data delivered to the DCs. Having a QC standard would significantly reduce these discrepancies.</p>	<p>Project Milestones:</p> <p>Draft QC Standard distributed for review: 09/2017 Revised Standard distrib. to CB for review: 01/2018 CB comments compiled, CB discussion: 02/2018 Data tested with draft QC software: 04/2018 Statistical Analysis on data to set bounds: 05/2018 Final QC proposal submit for ILRS approval: 08/2018 QC implemented at both OCs: TBD List QC Standard in Format Docs.: in next revision</p>
<p>Goal Statements:</p> <ul style="list-style-type: none"> Establish an ILRS standard for data quality checks Implement these quality checks at both OCs Provide documentation of the quality checks for incorporation into other ILRS materials (e.g. for inclusion in the CRD QC format document) 	<p>Stakeholders & Roles:</p> <p>QC Standard Development Team: Randy Ricklefs Christian Schwatke Kate Stevenson</p> <p>ILRS CB (Approves QC Standard) ILRS OCs (Implement QC Standard) ILRS DCs (Receive data from both OCs) ILRS DFPSC (Oversees ILRS Formats & Procedures) ILRS NESc (Provides input to QC Standard) ILRS Stations (Take SLR data and send to OCs) ASC (Analyzes SLR data) Other users of SLR data</p>
<p>Scope:</p> <p>The scope of this project is to define an ILRS quality check standard that applies to all data from all stations and to implement it at both OCs. Station-specific checks are outside the scope of this effort.</p>	

SLR Data Flow (Abbr.)



What have we done to upgrade the Quality Checks?

- Consolidated Rate Data (CRD) format documentation sets the baseline for data type and length.
 - Quality checks already in place at EDC
 - Quality checks already in place at NASA OC
 - Historical data as reference for upper and lower limits
 - Consulting with many ILRS CB members, SLR engineers, SLR stations, and data users
 - Maintaining a focus on ensuring that the quality checks remove spurious data, but are not so tight that they throw out good data
- } Draft Quality Check Standard

We combined these inputs to draft a complete quality check standard. Then we tested current SLR data against the draft standard to see how much data passed and failed the checks. We iterated this process several times, adjusting the checks based on results from real data and discussions with stakeholders.

How does this affect you?

- Stations will be notified of any routine non-compliances before the transition to the new QC.
- Come to Clinic Session 4: ILRS Procedures to talk about data from your station and see test results from the new QC Standard.
- Come to the Networks & Engineering Standing Committee meeting (see IWLR Schedule for time & location) to participate in the discussion of the revised QC.
- At the completion of this project, data users should not see any discrepancies in the data sets available at CDDIS and EDC because the NASA OC and the EDC will be applying the same quality checks to all data.

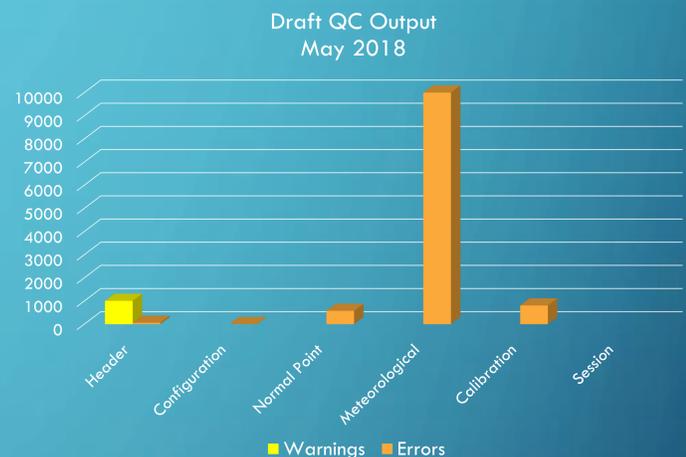
What comes next?

- NESC will do a final review of the proposed checks and recommend changes, if needed.
- Stations will be notified of the upcoming changes and affected data.
- The QC software will undergo final testing.
- The NASA OC and the EDC will coordinate a time to change to the new QC Standard and will publicize the date.
- The new QC will go into effect.

Potential Follow-On Projects

- Station-specific checks (e.g. meteorological conditions) are outside the scope of the current upgrade and could form the basis of another upgrade
- QC for CRD v2 will be finalized before the CRD v2 is deployed.

What did we find?



The first test of the draft QC standard flagged too many errors and needed adjustments in its bounds because it was throwing out good data in some areas and accepting bad data in others. Upper and lower limits on fields were adjusted and some issues were recategorized as warnings rather than errors. Stations with a large number of legitimate errors were notified of issues with their data.

After consultation with ILRS experts, adjustments to the QC, and some adjustments at stations there was another test:



The latest results have left only a few items that need to be addressed. These items might lead to more specific ILRS guidance.

- How often do meteorological records need to be recorded?
- What should the upper bound on beam divergence be?
- Which quality checks should lunar laser ranging data be exempt from?

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