



... for a brighter future



U.S. Department
of Energy



THE UNIVERSITY OF
CHICAGO



Office of
Science

U.S. DEPARTMENT OF ENERGY

A U.S. Department of Energy laboratory
managed by The University of Chicago

ACRF Operations and Data Quality

Doug Sisterson

**ACRF Operations Manager
Decision and Information Sciences Division
Argonne National Laboratory**

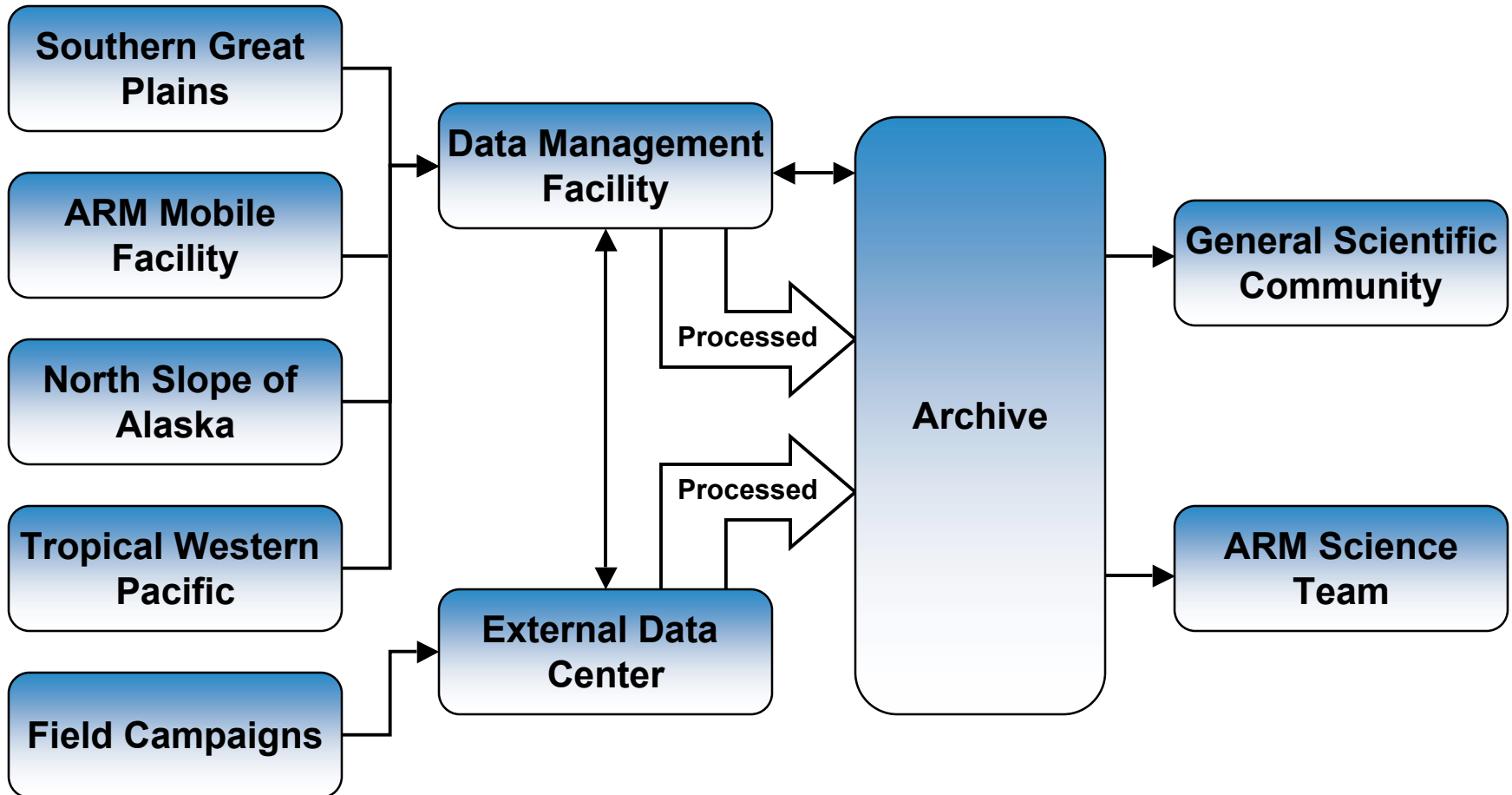
Jimmy Voyles

**ACRF Instruments Coordinator
Atmospheric Science & Global Change Division
Pacific Northwest National Laboratory**

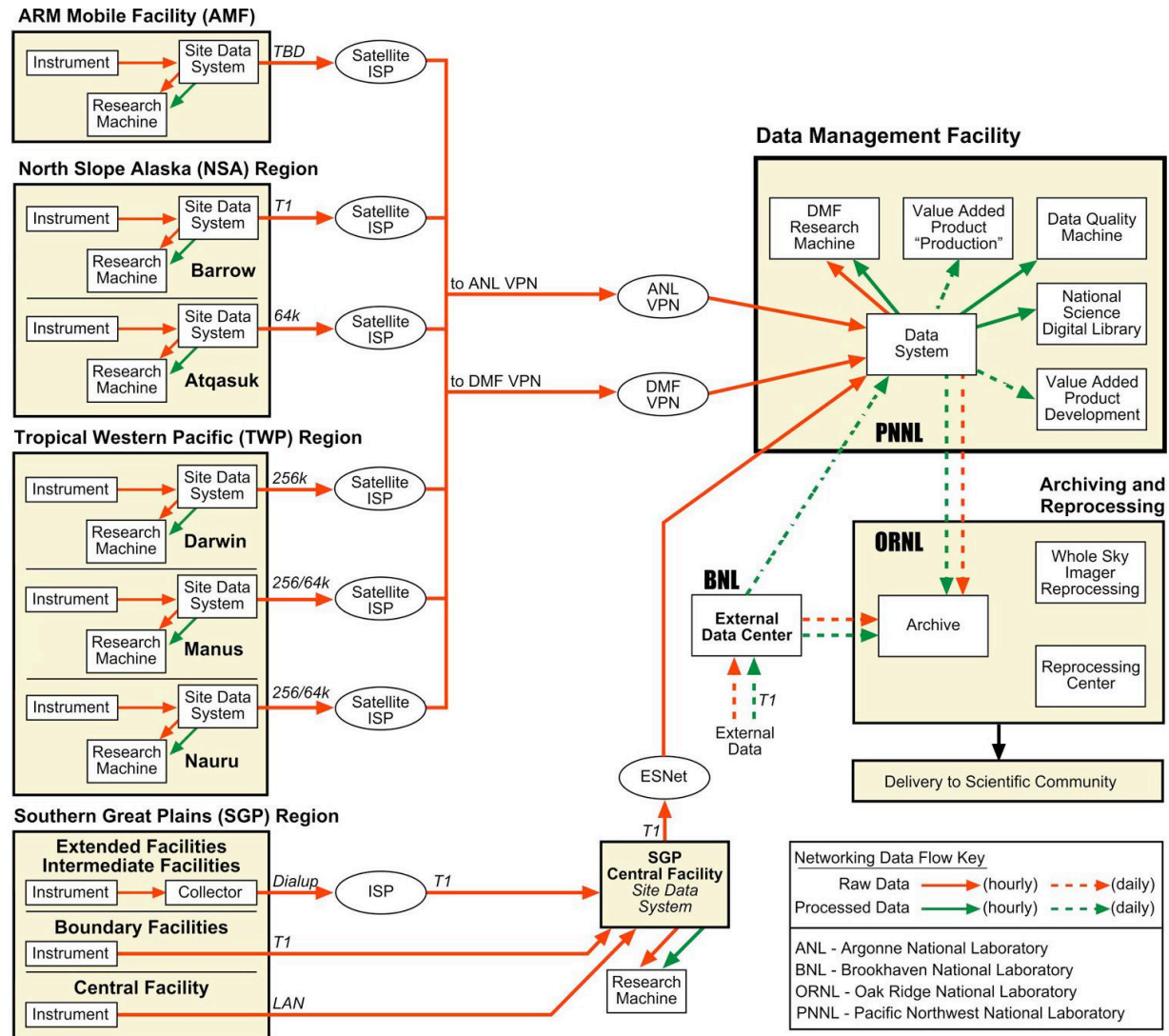
*Meeting on the Implementation of the
GCOS Reference Upper Air Network (GRUAN)*

ARM Site Locations

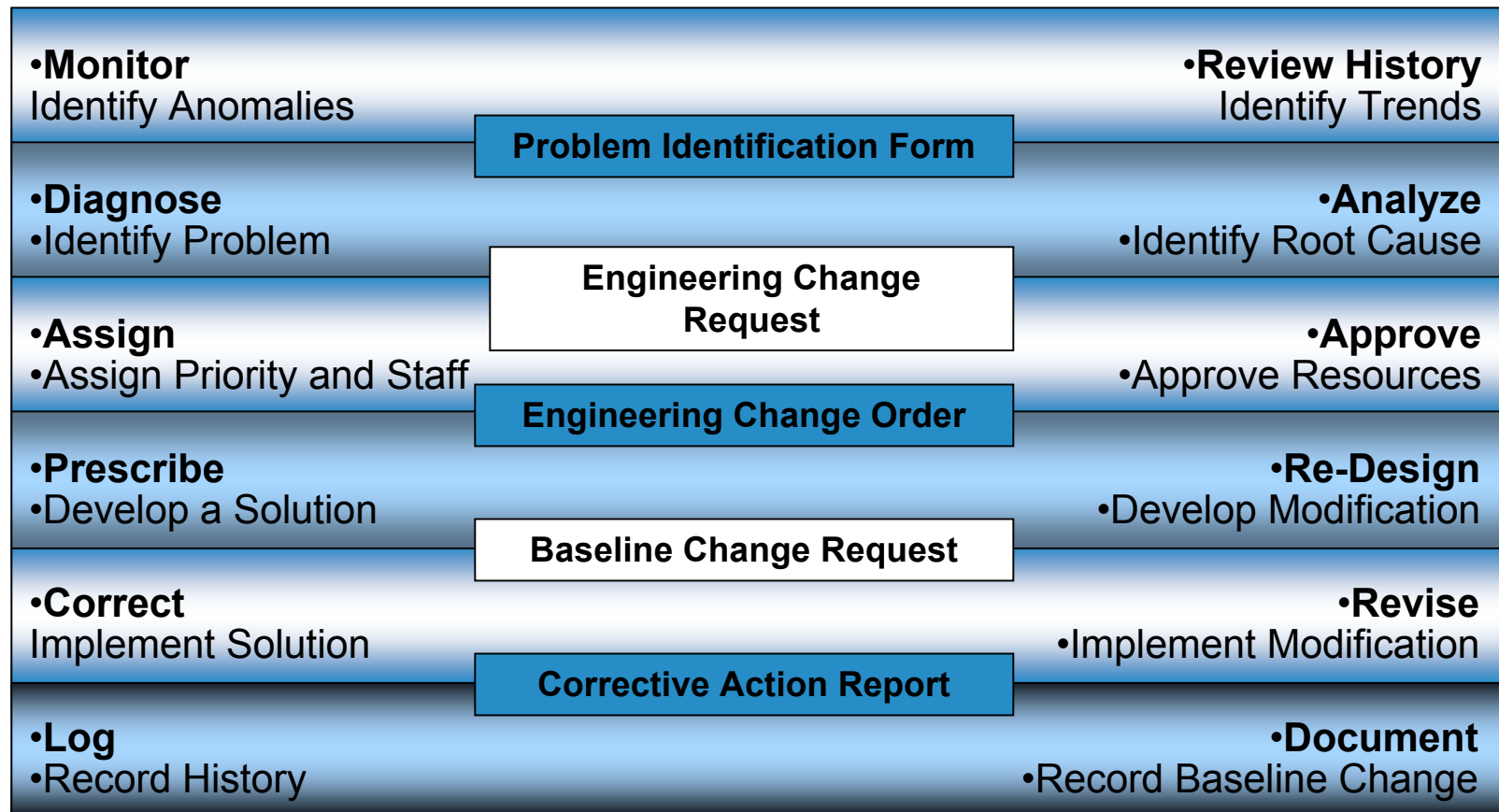
ACRF Block Diagram



ACRF Data Flow



Engineering and Operations Management Processes and Procedures



ACRF Operations

Tools: Data Quality Problem Report

DQPR Details - Microsoft Internet Explorer

You are logged in as user: Guest

Data Quality Problem Report (DQPR): 191

Issue Date: 1/2/2004 **DQPR Originator:** IM - Victor Morris
Date Closed: 2/19/2004
Location: NSA - CI, Central Facility, Barrow AK
Instrument: SKYRAD

DQProblem Date Range:
 Start: 12/11/2003 12:00
 End: unspecified

QA Code: Questionable Data
QA Reason(s): Instrument problem

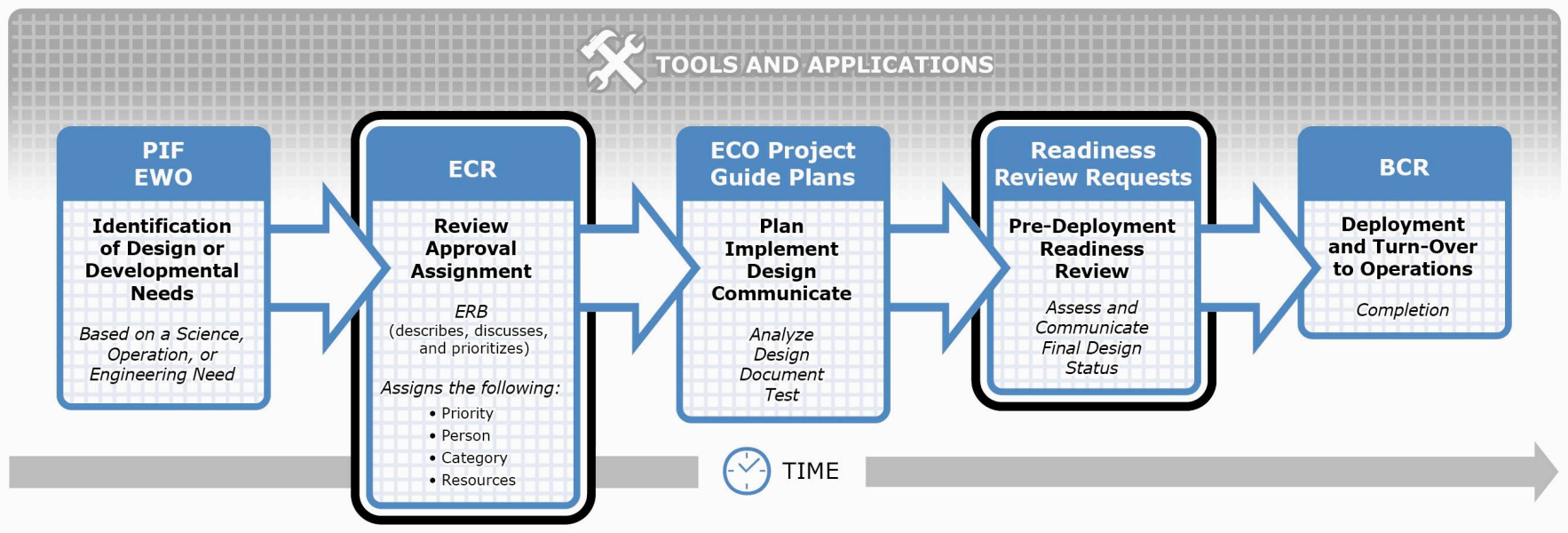
Problem Description:
 The downwelling IRT is measuring higher sky/cloud temperatures than the AERI. This could be due to either a dirty lens or a failed heater, assuming the AERI is ok. It does not appear to be due to the mirror since the problem has persisted since the mirror was changed on Christmas day. Please check the IRT lens and heater.

DQPR HISTORY:

Entry Date/Time (GMT)	Who	Comment		
01/21/2004 18:51	IM - Victor Morris	This problem may be related to that reported in DQPR-189 but the lens should still be checked.		
01/22/2004 17:33	OPS - Jeffrey Zirzow	<table border="0"> <tr> <td><u>MAINTENANCE PERFORMED</u> Checke lens, not dirty. replaced mirror, old one scratched. See CM report</td> <td>Maintenance Date 01/09/2004</td> </tr> </table>	<u>MAINTENANCE PERFORMED</u> Checke lens, not dirty. replaced mirror, old one scratched. See CM report	Maintenance Date 01/09/2004
<u>MAINTENANCE PERFORMED</u> Checke lens, not dirty. replaced mirror, old one scratched. See CM report	Maintenance Date 01/09/2004			
02/13/2004 21:22	IM - Victor Morris	Changing the mirror appears to have corrected the problem. I have submitted DQR D040213.4.		
02/17/2004 00:00	DBA - Kathy Doty	I have linked this DQPR to the DQR that Vic submitted (D040213.4) rather than the original placeholder DQR. The status of the DQPR will remain at pending DQR until D040213.4 is reviewed and accepted by the PRB		
02/19/2004 21:19	IM - Victor Morris	DQR D040213.4 submitted and Reviewed by PRB		
03/31/2004 18:17	OPS - Jeffrey Zirzow	<table border="0"> <tr> <td><u>MAINTENANCE PERFORMED</u> Mirror replaced with clean mirror.</td> <td>Maintenance Date 01/09/2004</td> </tr> </table>	<u>MAINTENANCE PERFORMED</u> Mirror replaced with clean mirror.	Maintenance Date 01/09/2004
<u>MAINTENANCE PERFORMED</u> Mirror replaced with clean mirror.	Maintenance Date 01/09/2004			
03/31/2004 18:17	OPS - Jeffrey Zirzow	This documentation should close the loop and allow this DQPR to be closed.		

Current DQPR Status: Closed

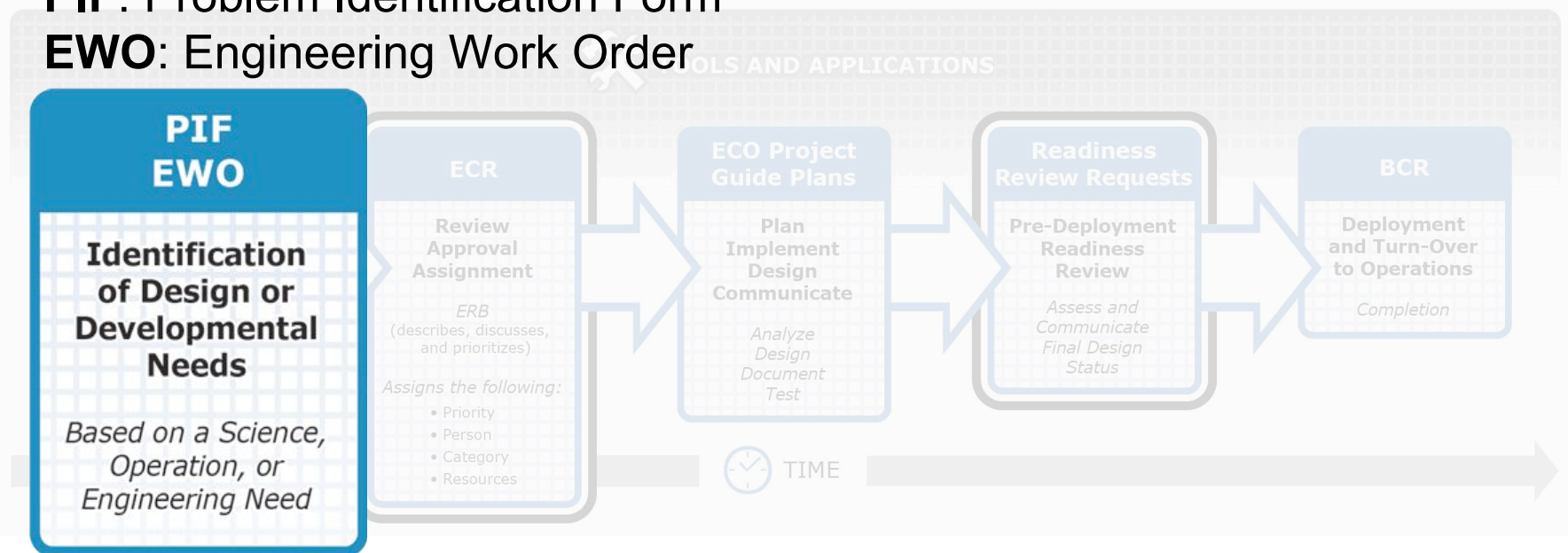
Management Process Engineering



Management Process Engineering

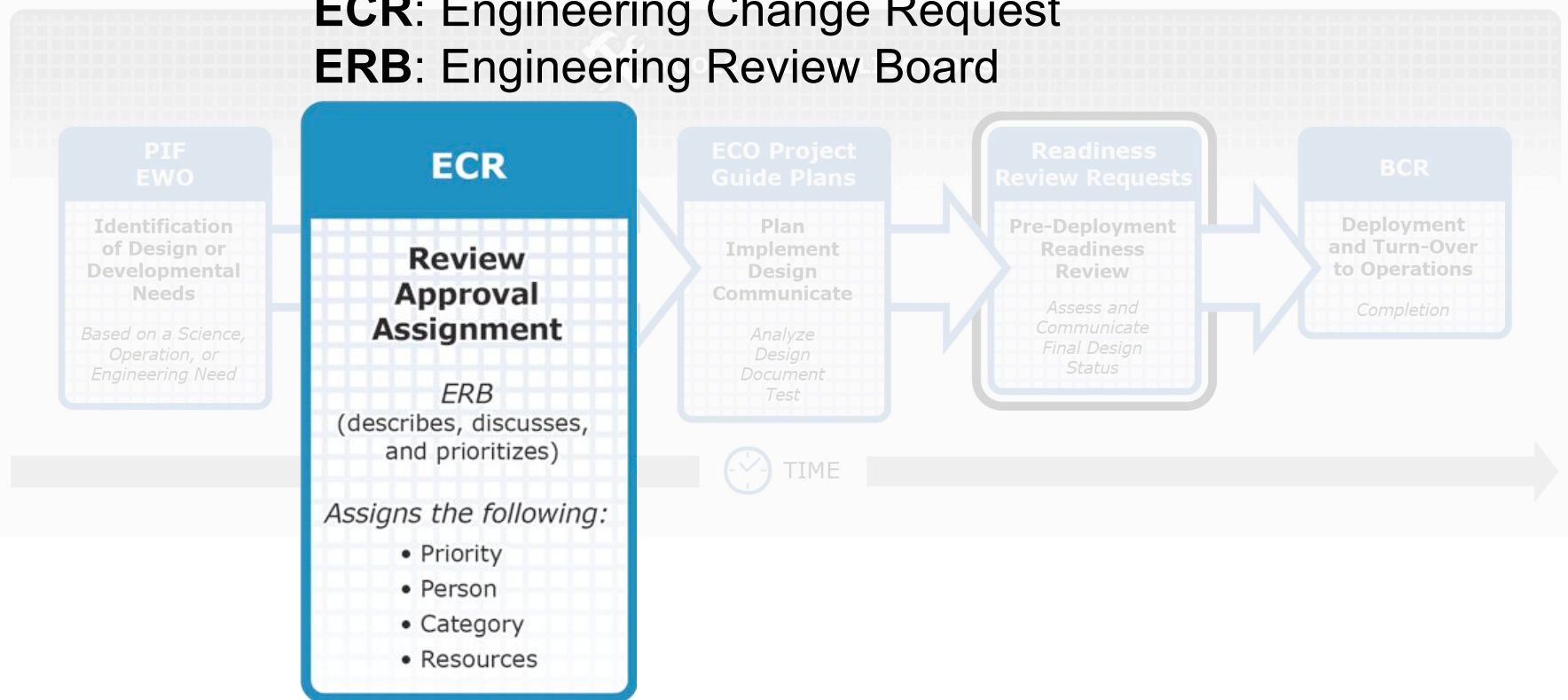
PIF: Problem Identification Form

EWO: Engineering Work Order

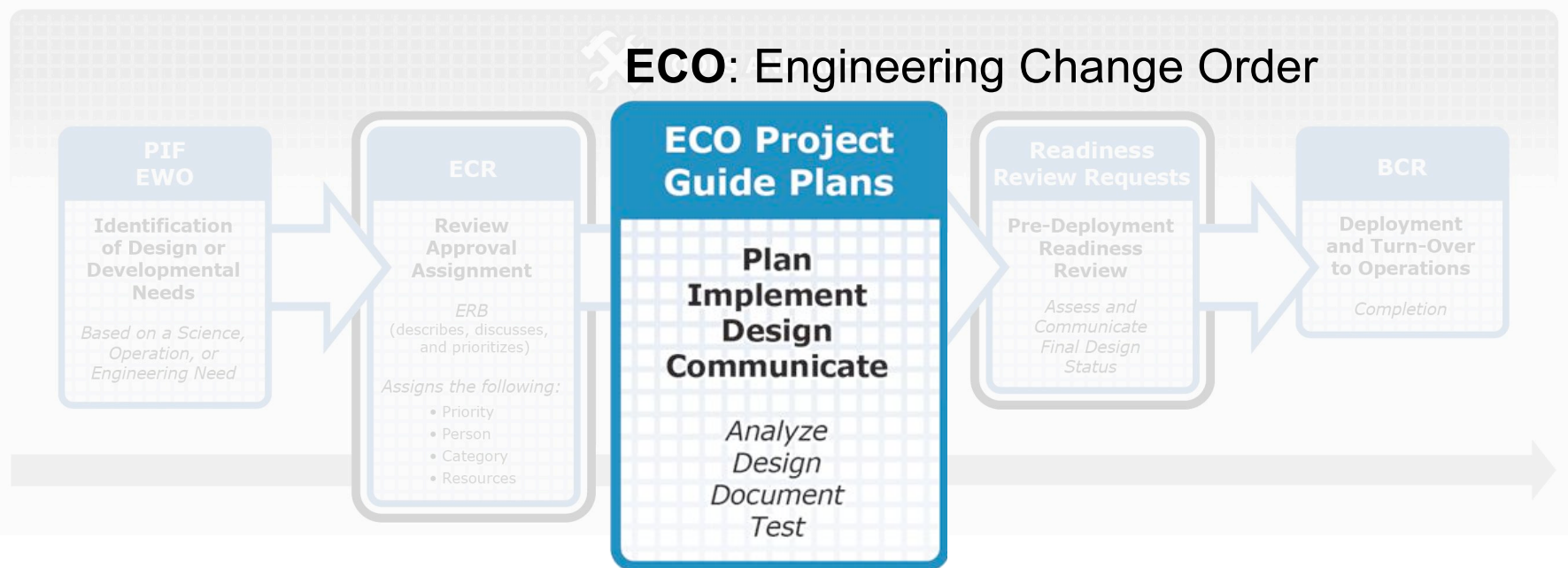


Management Process Engineering

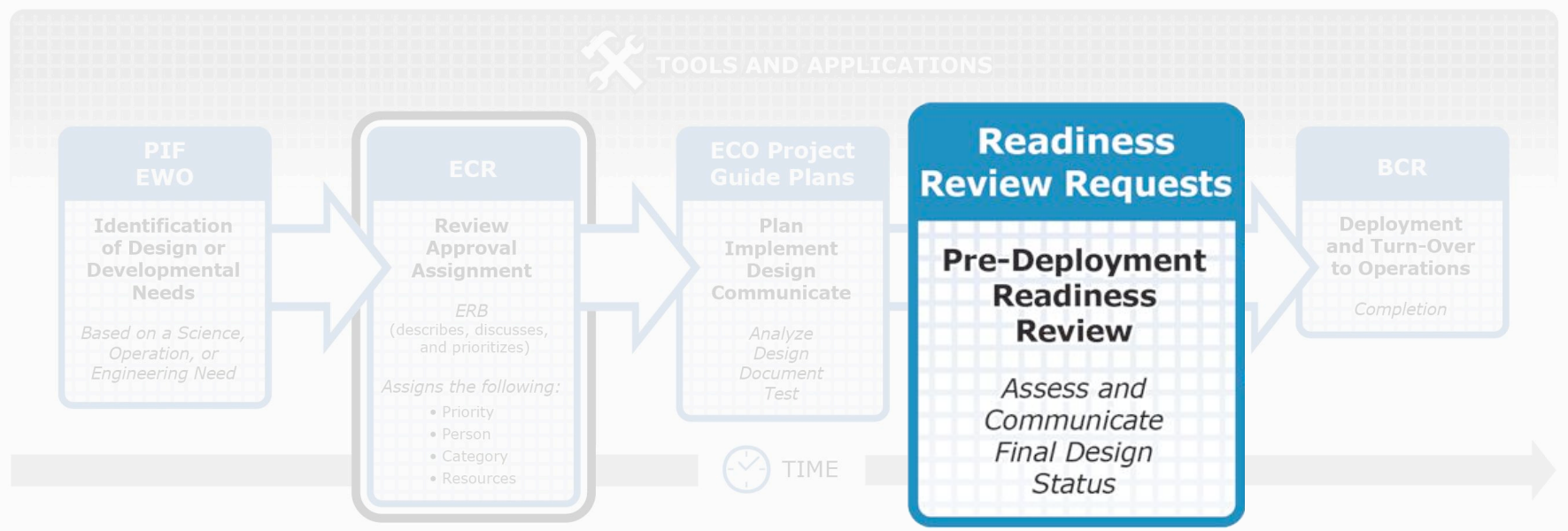
ECR: Engineering Change Request
ERB: Engineering Review Board



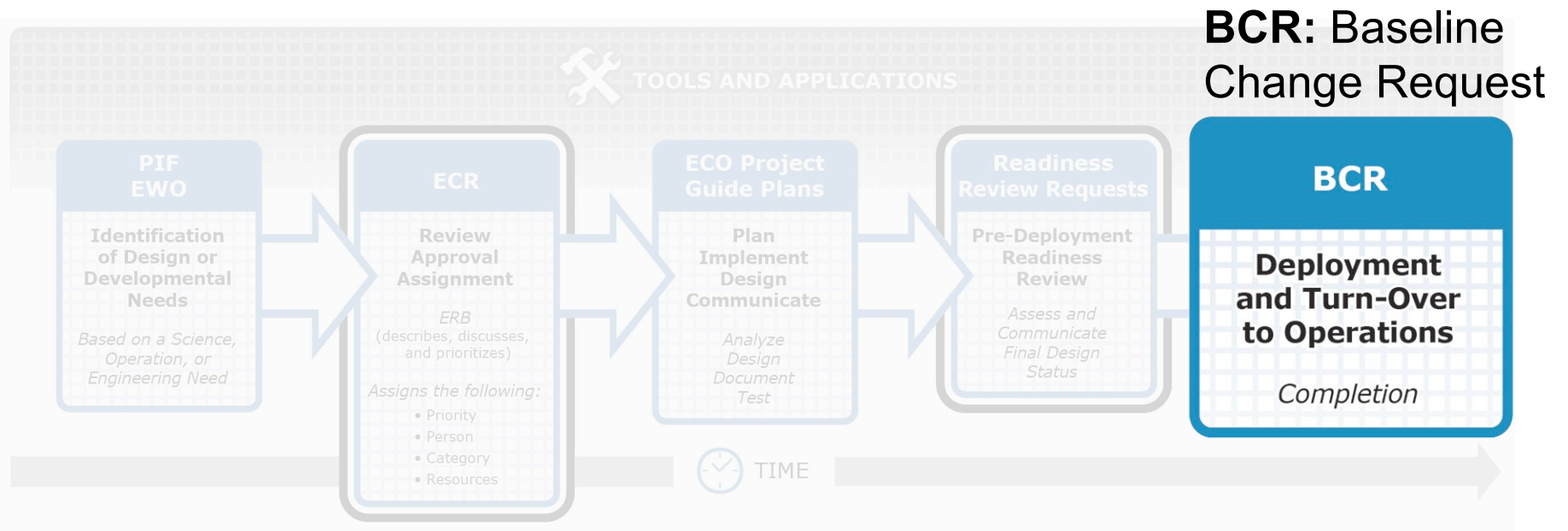
Management Process Engineering



Management Process Engineering



Management Process Engineering



Management Process Operations

Tools: Baseline Change Request

ARM Change Request System - Microsoft Internet Explorer

Address: [http://www.twppo.lanl.gov/oms.acgi\\$acr.admin.modify?1885](http://www.twppo.lanl.gov/oms.acgi$acr.admin.modify?1885)

ARM Change Request System Baseline Change Request Administration

ARM Climate Research Facility

BCR Home | ECR Home

Identifier: BCR-00982

Change ID Close Delete

Sites Affected: SGP NSA TWP AMF DMF XDC ARCHIVE Other*
*Please specify "Other" in Change Description

Instruments Affected: [update instruments](#)

Viewable on WWW?

Summary

Releasing new version of the TSI ingest

Requested by: Sutanay Choudhury on 01/12/2005

Requester E-Mail: sutanay.choudhury@pnl.gov

State: Open **Current Status:** Implementing **Priority:** 3 - Very Important

Requested Completion Date: 01/13/2005

Date Opened: 01/12/2005 **Date Closed:** BCR Not Closed

Description

The new version of the TSI ingest is ready to be released. This version will be able to process data produced by both TSI880 and TSI660 models. However, the data object design for the output netcdf file will remain same. The major

Apply Changes Reset



Argonne
NATIONAL
LABORATORY

... for a brighter future



U.S. Department
of Energy



THE UNIVERSITY OF
CHICAGO



**Office of
Science**

U.S. DEPARTMENT OF ENERGY

A U.S. Department of Energy laboratory
managed by The University of Chicago

ACRF Data Quality Office

Real-Time Data Inspection and Assessment

Randy Pepler Manager Data Quality Office

Ken Kehoe

Karen Sonntag

Justin Monroe

Nathan Hiers

Kimberly Rabon

Stephen Mullens

Lacey Evans

**Cooperative Institute for Mesoscale
Meteorological Studies,
The University of Oklahoma, Norman, OK**

Sean Moore

**Mission Research and Technical Services,
Santa Barbara, CA**

Data Quality Evolution

- ✿ **The ARM Data Quality Office was established** in July 2000 at the University of Oklahoma.
- ✿ **Its goal** is to inspect and assess ACRF data in the near real-time in order to ensure optimal instrument performance and provide the best data possible for scientific research.

Overview

- Reasons for a Data Quality Office
- Primary Functions
- Inspection, Assessment, and Reporting
- Reporting Mechanisms
- Proposed Additions
- Challenges

Reasons for Data Quality Office

Data must be available, usable, and accessible

- Users must be able to readily tell whether the data have been examined, how they were reviewed, and whether there are known problems
- This information is communicated via quality information and ancillary data quality reports and databases

Primary Functions

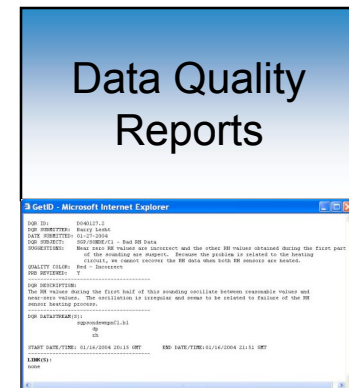
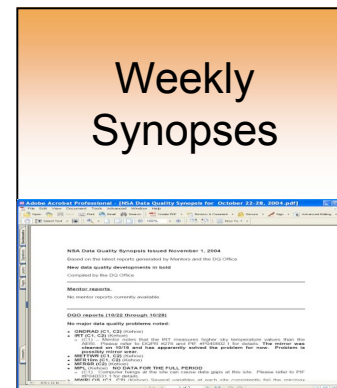
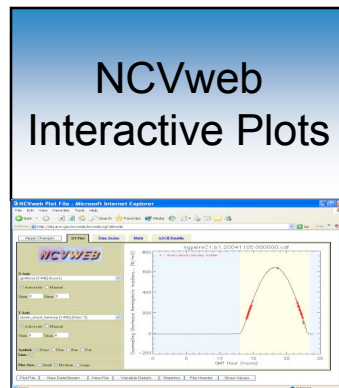
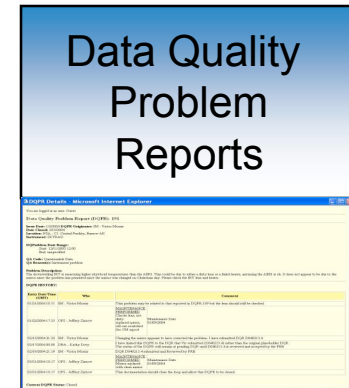
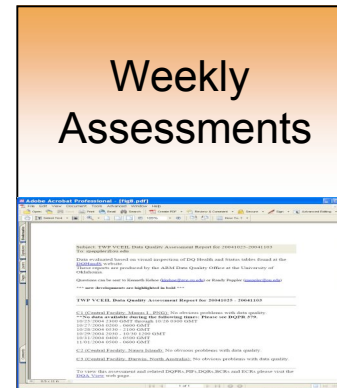
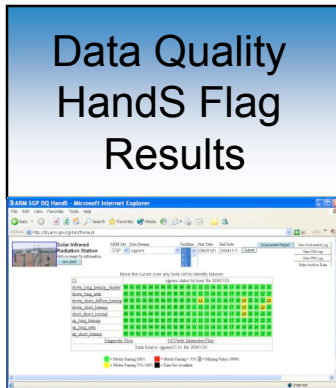
- Coordinate a data quality program
- Inspect and assess all data streams
- Report results to infrastructure and users
- Work closely with infrastructure to quickly identify and resolve problems

Primary Functions

- Help devise and implement tools to perform data quality analysis
- Help create and organize documentation of data quality results
- Ensure program consistency across the sites

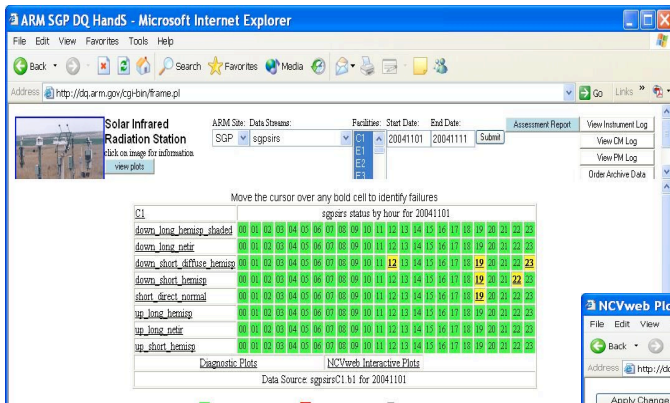
Inspection, Assessment, Reporting

Data Quality Office



Inspection, Assessment, Reporting Data Quality Office

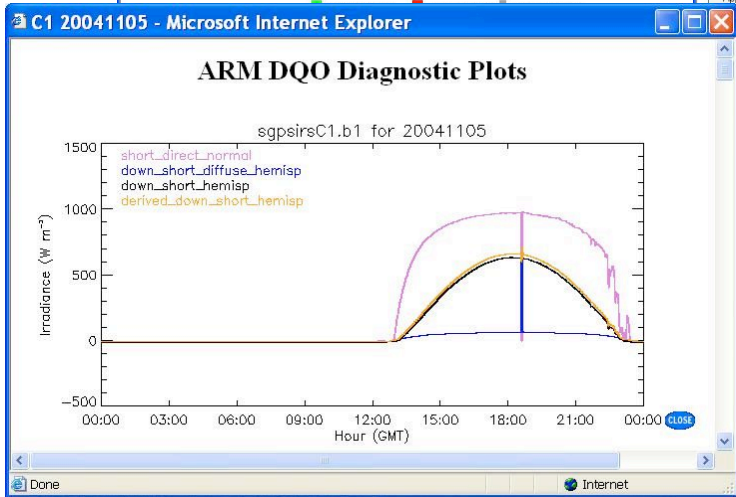
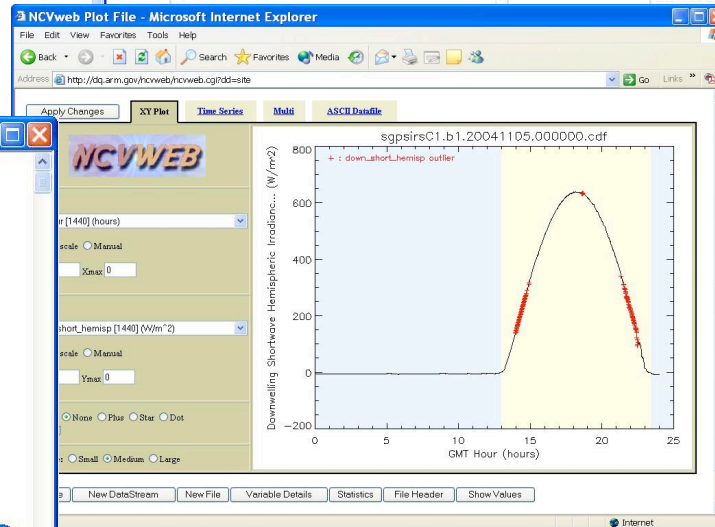
Inspect → Assess → Report



Weekly Assessments

Data Quality Problem Reports

Data Quality Reports



Inspection, Assessment, Reporting

Data Quality Office

Inspect → Assess → Report

The central Adobe Acrobat Professional window displays an email with the following content:

Subject: TWP VCEIL Data Quality Assessment Report for 20041025-20041103
To: rpeppler@ou.edu

Data evaluated based on visual inspection of DQ Health and Status tables found at the [DOHAndS](#) website. These reports are produced by the ARM Data Quality Office at the University of Oklahoma.

Questions can be sent to Kenneth Kehoe (kkehoe@acn.ou.edu) or Randy Peppler (rpeppler@ou.edu)

*** new developments are highlighted in bold ***

TWP VCEIL Data Quality Assessment Report for 20041025 - 20041103

C1 (Central Facility, Manus I, PNG). No obvious problems with data quality.
No data available during the following
10/25/2004 2300 GMT through 10/26 0300 GMT
10/27/2004 0200 - 0600 GMT
10/28/2004 0530 - 2100 GMT
10/29/2004 2030 - 10/30 1200 GMT
10/31/2004 0400 - 0500 GMT
11/01/2004 0500 - 0600 GMT

C2 (Central Facility, Nauru Island). No obvious problems with data quality.
C3 (Central Facility, Darwin, North Aust). No obvious problems with data quality.

To view this assessment and related DQQA [View](#) web page.

The bottom-right Adobe Acrobat Professional window displays a PDF report titled "NSA Data Quality Synopsis for October 22-28, 2004.pdf".

NSA Data Quality Synopsis Issued November 1, 2004

Based on the latest reports generated by Mentors and the DQ Office

New data quality developments in bold

Compiled by the DQ Office

Mentor reports.
No mentor reports currently available.

DOO reports (10/22 through 10/28)

No major data quality problems noted:

- GNDRAD (C1, C2) (Kehoe)
- IRT (C1, C2) (Kehoe)
 - (C1) -- Mentor notes that the IRT measures higher sky temperature values than the AERI. Please refer to DQPR #278 and PIF #P040802.1 for details. **The mirror was cleaned on 10/15 and has apparently solved the problem for now. Problem is possibly mirror wear.**
- METWR (C1, C2) (Kehoe)
- MFR10m (C1, C2) (Kehoe)
- MFRSR (C2) (Kehoe)
- MPL (Kehoe) **NO DATA FOR THE FULL PERIOD**
 - (C1) Computer hangs at the site can cause data gaps at this site. Please refer to PIF #P040331.1 for details.
- MWRI OR (C1, C2) (Kehoe) Several variables at each site consistently fall the min/max

Inspection, Assessment, Reporting

Data Quality Office

Inspect → Assess → Report

Data Quality
HandS Flag
Results

Assess

Data Quality
HandS
Diagnostic Plots

DQPR Details - Microsoft Internet Explorer

You are logged in as user: Guest

Data Quality Problem Report (DQPR): 191

Issue Date: 10/20/04 **DQPR Originator:** IM - Victor Morris
Date Closed: 01/19/2004
Location: NSA - CI, Central Facility, Barrow AK
Instrument: SKYRAD

DQPR Date Range:
 Start: 12/11/2003 12:00
 End: unspecified

QA Code: Questionable Data
QA Reason(s): Instrument problem

Problem Description:
 The downwelling IRT is measuring higher sky/cloud temperatures than the AERI. This could be due to either a dirty lens or a failed heater, assuming the AERI is ok. It does not appear to be due to the mirror since the problem has persisted since the mirror was changed on Christmas day. Please check the IRT lens and heater.

DQPR HISTORY:

Who	Comment
I - Victor Morris	This problem may be related to that reported in DQPR-189 but the lens should still be checked.
PS - Jeffrey Zimov	MAINTENANCE PERFORMED Check lens, not dirty Maintenance Date replaced mirror: 01/09/2004 all OK checked

Calendar - Netscape

Data Stream: Start Date: End Date: sgpmpmc1.b1:01-01-2004:01-01-2004

Change Date Range: [Previous Two Months] [Next Two Months]

Start date: (mm/dd/yyyy) End date: (mm/dd/yyyy) Use Defaults

Measurements:
 1) Radiation, longwave, brightness temperature, 23.9 GHz
 2) Radiation, longwave, brightness temperature, 31.4 GHz
 3) Water vapor, total along line-of-sight path
 4) Water, liquid, total along line-of-sight path
 5) Brightness Temperature

Notes: Colors inside the box represents auto quality check (Auto QC) colors and the symbols inside the box represents Alaska Quality Report (AQR) colors

Legend (color/status):
 [] Missing [] Undetermined [] Review Pending [] Good [] Suspect [] Incorrect

Symbol
 G: Green DQR Y: Yellow DQR R: Red DQR

Calendar Date Range: 10-10-2004 To 11-30-2004 Help

Date	0102030405
10-10-2004	[G]
10-11-2004	[G]
10-12-2004	[G]
10-13-2004	[G]
10-14-2004	[G]
10-15-2004	[G]
10-16-2004	[G]
10-17-2004	[G]
10-18-2004	[G]
10-19-2004	[G]
10-20-2004	[G]
10-21-2004	[G]
10-22-2004	[G]
10-23-2004	[G]
10-24-2004	[G]
10-25-2004	[G]
10-26-2004	[G]
10-27-2004	[G]
10-28-2004	[G]
10-29-2004	[G]
10-30-2004	[G]
10-31-2004	[G]

GetID - Microsoft Internet Explorer

DQR ID: D040127.2
 DQR SUBMITTER: Barry Lesht
 DATE SUBMITTED: 01-27-2004
 DQR SUBJECT: SGP/SOMDE/CI - Bad RH Data
 SUGGESTIONS: Near zero RH values are incorrect and the other RH values obtained during the first part of the sounding are suspect. Because the problem is related to the heating circuit, we cannot recover the RH data when both RH sensors are heated.

QUALITY COLOR: Red - Incorrect
 PFB REVIEWED: Y

DQR DESCRIPTION:
 The RH values during the first half of this sounding oscillate between reasonable values and near-zero values. The oscillation is irregular and seems to be related to failure of the RH sensor heating process.

DQR DATASTREAM(S):
 sgpsondempnc1.b1
 dp
 rh

START DATE/TIME: 01/16/2004 20:15 GMT END DATE/TIME: 01/16/2004 21:51 GMT

LINK(S):
 none

Reporting Mechanisms

- Data Quality Report (DQR)
 - Report to data user on a problem found and solved (or not)
 - Attached to data files when ordered from the Archive
 - Retroactively distributed from the Archive by email to previous data requestors



Overview

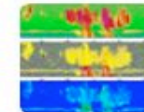
One of the goals of the ARM Program is to provide data streams of reasonable quality for scientific research. Traditionally, data quality issues have been addressed within ARM at several levels, including by instrument mentors, site scientists, value-added product scientists, and Science Team members at large. Maintaining data quality for a program of the size and complexity of ARM is a significant challenge — our efforts toward this end have matured and evolved over the life of the program.

The ARM Program Data Quality (DQ) Office, established in July 2000, conducts a [data quality program](#) to ensure the quality of the data collected by ARM field instrumentation. The DQ Office has the responsibility for ensuring that quality assurance results are communicated to 1) data users so that they may make informed decisions when using the data, and 2) ARM's site operators and engineers to facilitate optimal instrument performance and minimize the amount of unacceptable data collected.

On this page you will find links to our Data Quality Health and Status (**DQ Hands**) tool that allows us to inspect and assess ARM data on a near real-time basis and our interactive data plotting tool, **NCVweb**. Also provided are links to the ARM **Report Search Tool**, and an archive of weekly **Data Quality Assessment Reports**.

Questions and comments about the Data Quality Office, or specific ARM datastreams can be directed to [Randy Peppler](#), [Ken Kehoe](#), [Karen Sonntag](#), or [Sean Moore](#).

DQ Hands



- [QC Metrics and Plots](#)
- [Plot Browser](#)
- [DQ wiki](#)

NCVweb



- [Interactive Data Plotting](#)

DQ Reports



- [Search All Reports](#)
- [DQ Assessment Reports](#)
- [Report Findings](#)



Send comments for: [WWW Administrator](#)
[Privacy & Security Notice](#)
All [rights](#) reserved.

dq.arm.gov

Reporting Mechanisms

Data Quality Problem Report (DQPR)

- Internal mechanism to alert instrument mentors, site operators, and site scientists of a data quality (i.e., instrument performance) problem
- Captures discussion and sequence of actions performed to resolve the problem
- Spawns data quality report to data user

Reporting Mechanisms

Data Quality Report (DQR) – cont.

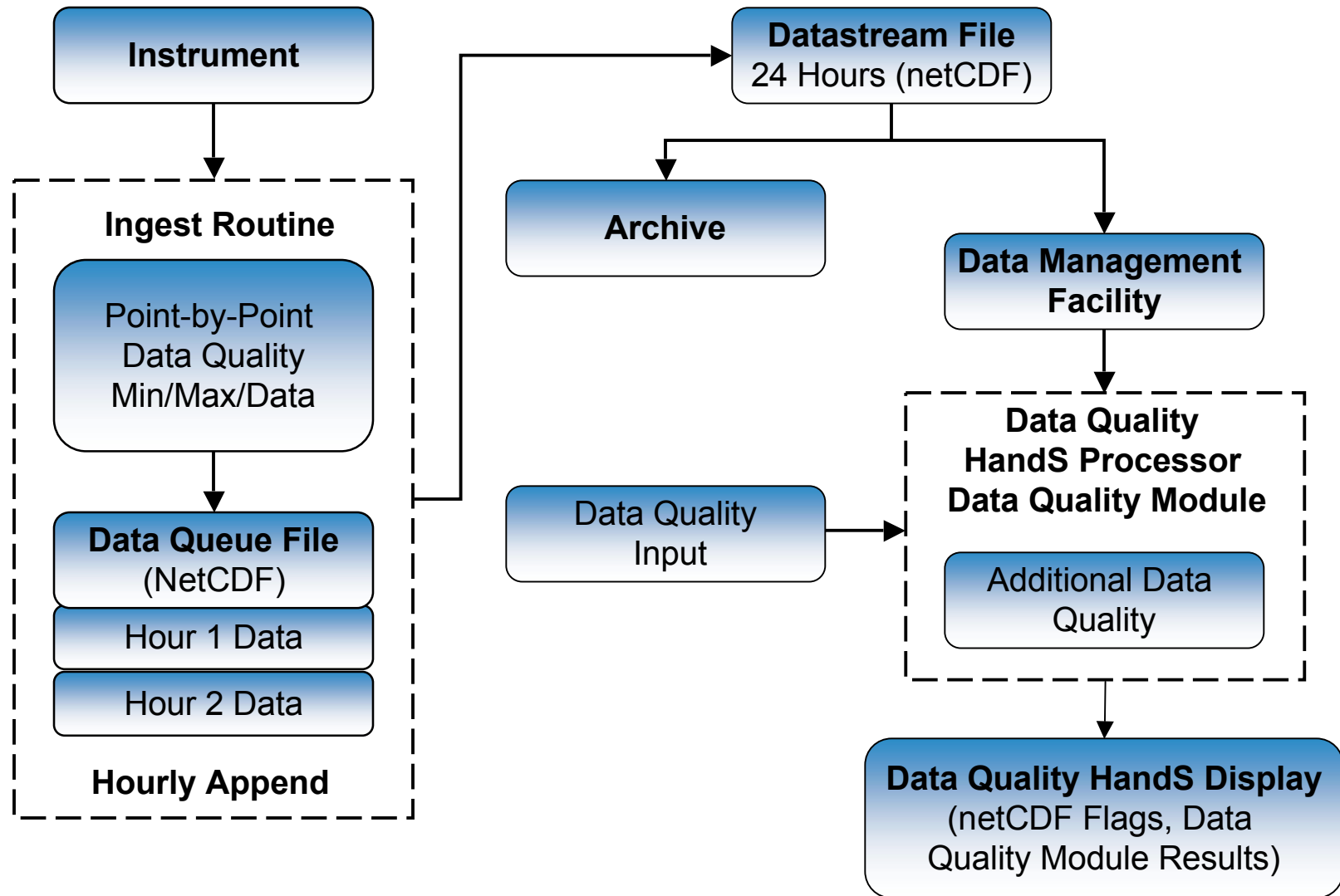
- Dynamically viewed during data selection in the ARM data browser
- Accessed by links in the thumbnail browser
- Searched by keywords and full text

Flags

- Contained in data files for most instruments

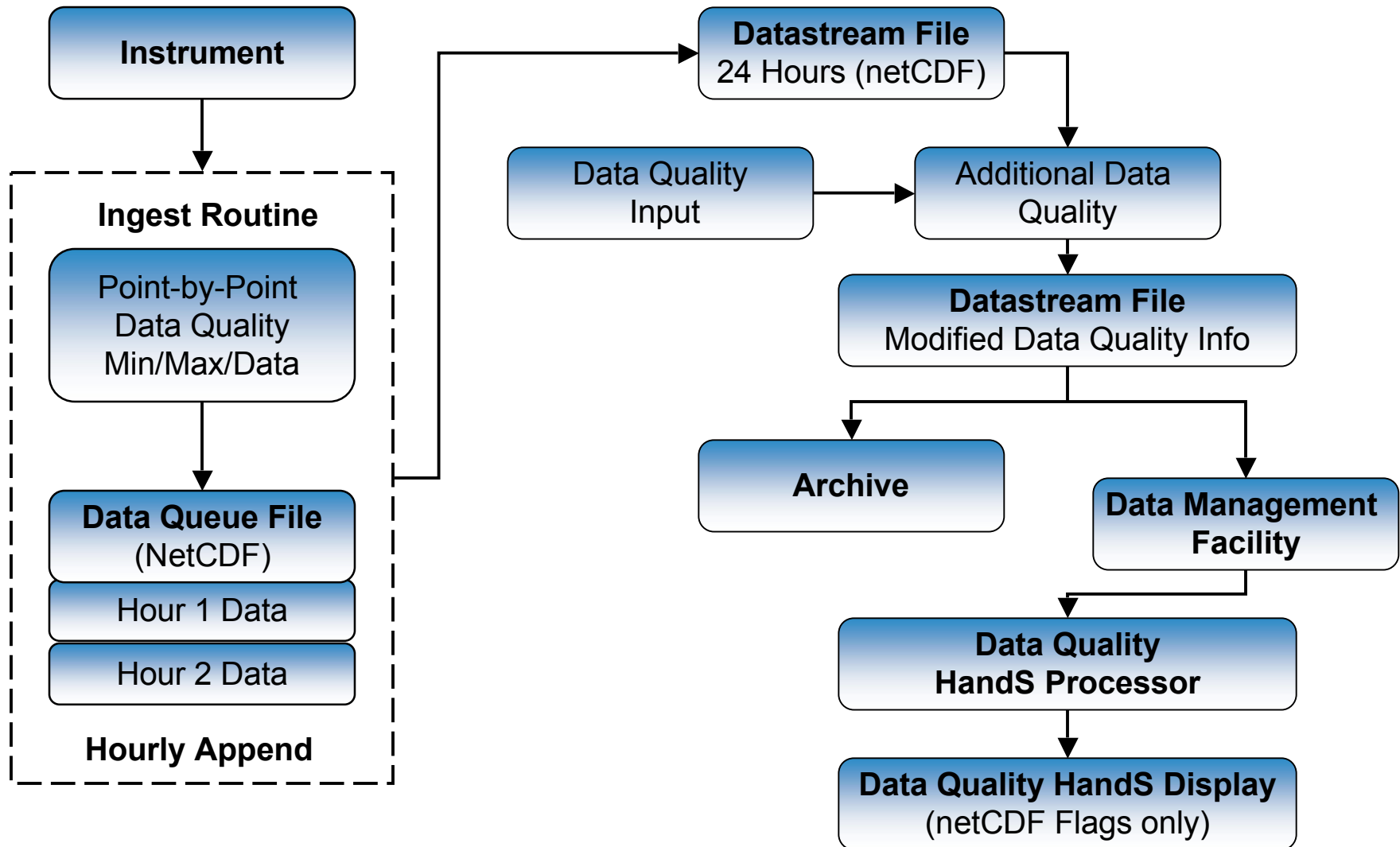
Proposed Additions

Data Quality Flag Processing Path: Current Perspective



Proposed Additions

Data Quality Flag Processing Path: Proposed Revision



ARM Climate Research Facility:
A DOE/BER National User Facility for Climate
Observations for Climate Research

WWW.ARM.GOV

