The JLab *Pansophy* System

C. Reece

Pansophy

- In anticipation of both the CEBAF 12 GeV Upgrade project as well as the desire to enable better learning from R&D tests, a small effort was launched in 1999 to bring the convenience of modern web-based MIS tools to bear on the production and testing of SRF cavities and cryomodules.

- **Chief system requirements:**
  - One system used for all SRF projects at JLab
  - Content and structure is driven by technical project owners
  - Useful for capturing and tracking version-controlled procedures
  - Useful for enabling project QA
  - Useful for logging and tracking QC data
  - Useful for capturing and accessing all collected relevant data
  - Open for user-driven data analysis and “mining”
  - Robustly secured and maintainable
  - Low overhead

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Pansophy is now in full operation.

- The chief vehicles of the implementation of *Pansophy* are template-derived MS-Word files composed and approved by the responsible technical staff.
  - These ***Travelers*** contain, either directly or via imbedded hyperlinks, all necessary instructions (including drawings and reference procedures) for accomplishing the described work.
  - They also define the data to be acquired during execution of the work by entry fields and/or file uploads.
  - From these Travelers, *Pansophy* automatically creates the required Oracle™ database tables based on the data fields called-for therein.
  - Scripts transform the MS-Word files into Cold Fusion™ web-based forms with SQL writes and reads.

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Travelers, continued

- Other than the composition of the travelers, all user interactions with *Pansophy* are via the web.
  - Completed travelers are browsable with the same procedures presented as during use, but with data-fields populated via live queries.
  - A variety of user-controlled query tools are also available.
- Project-specific **report** forms have been constructed which imbed systematic queries for repeated use.
  - Over 200 travelers were composed and used for the SNS cavities and cryomodules.
  - 54 travelers are in use supporting the CEBAF “C50” cryomodule rework project.
  - 70 travelers have been used for cavities & cryomodules in preparation for the 12 GeV Upgrade project.
- The development of *Pansophy* has been documented in the PAC ‘01, ‘03, ‘05, & SRF2007 proceedings, as well as ICALEPCS 2001.
- The JLab SRF Processes and Materials group in the SRF Institute includes in its mission the maintenance and development of *Pansophy* for JLab use.

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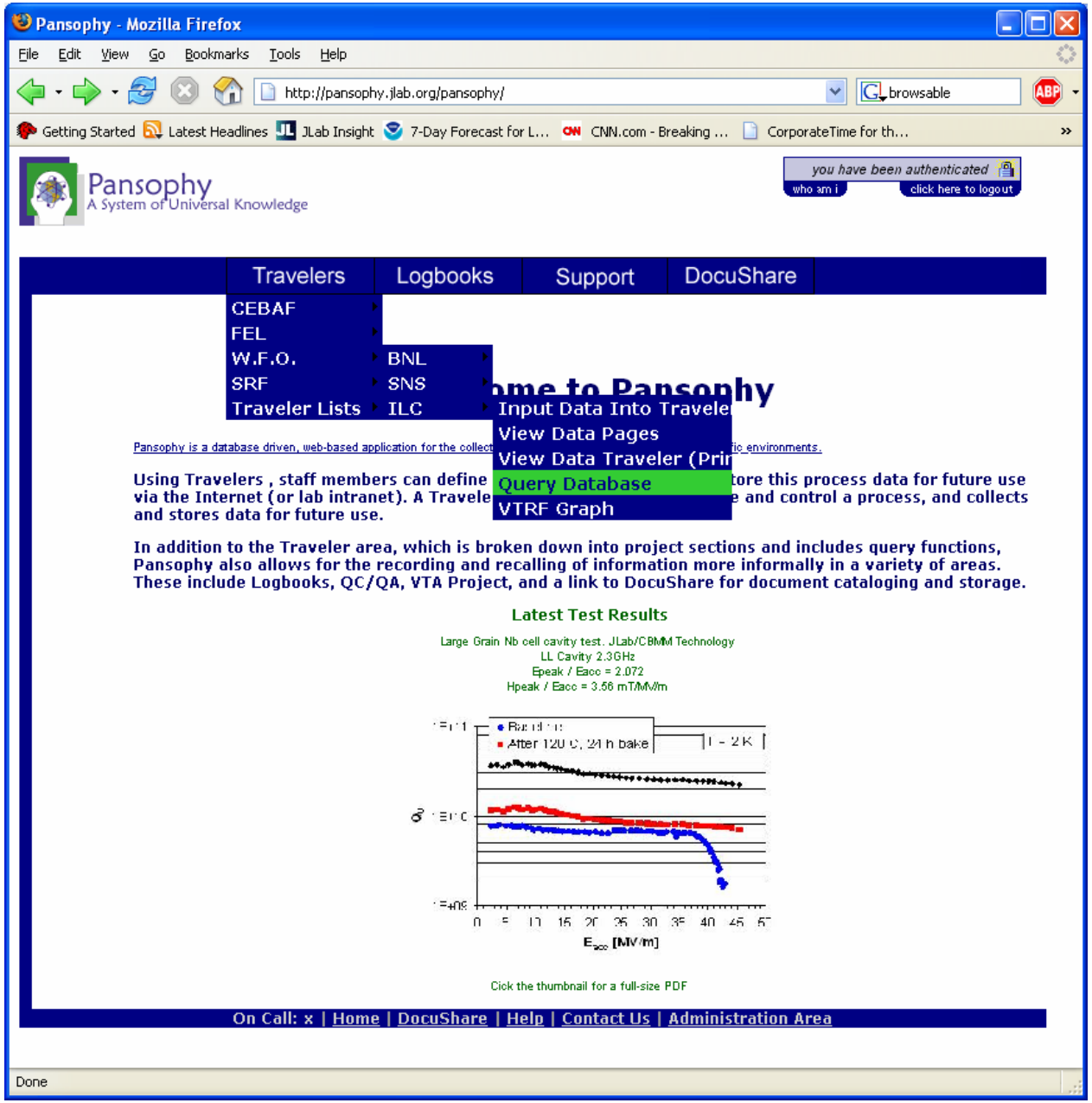
Homepage



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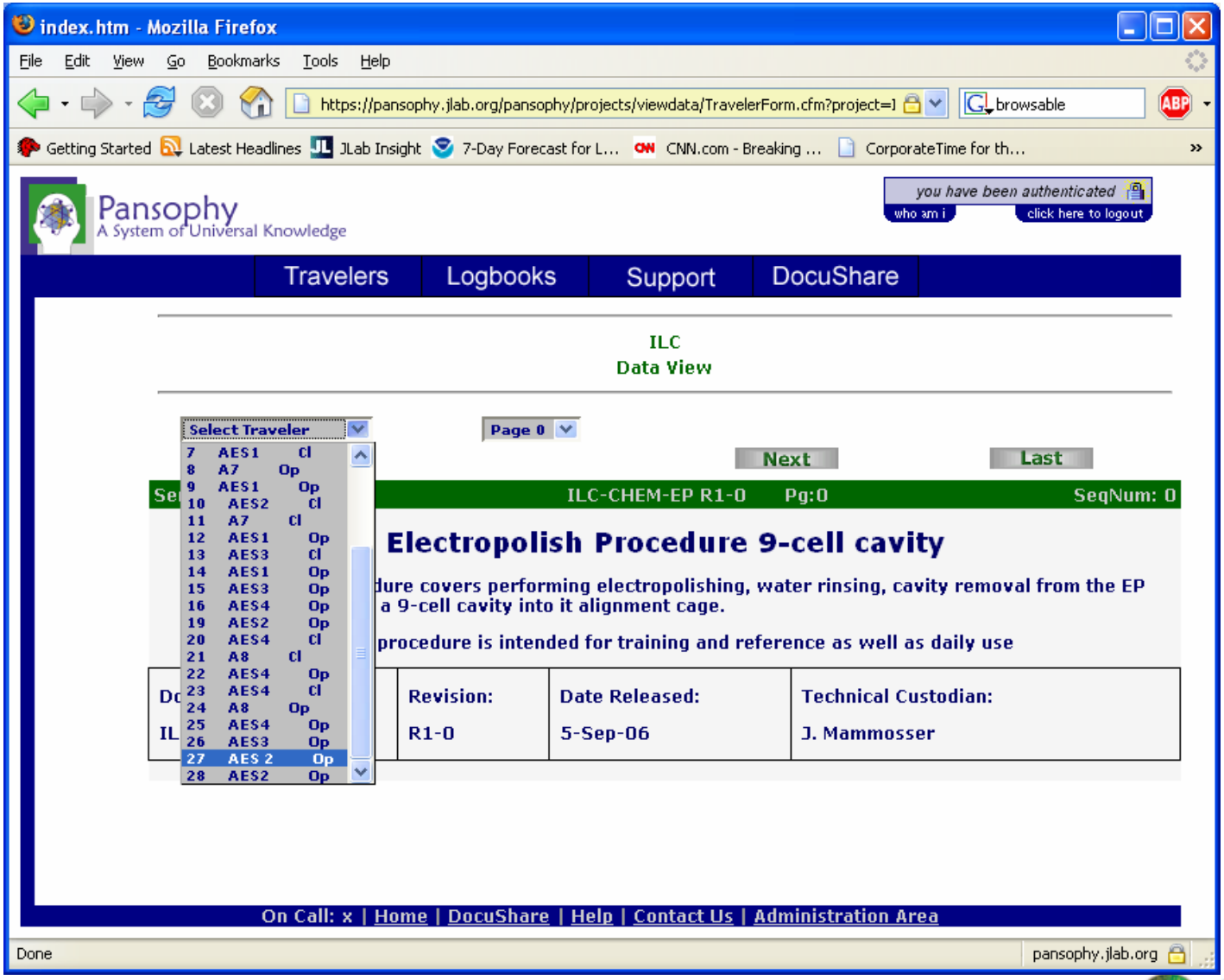
Example: ILC EP Traveler

This view recalls a particular "instantiation" of this traveler, i.e. one particular use.



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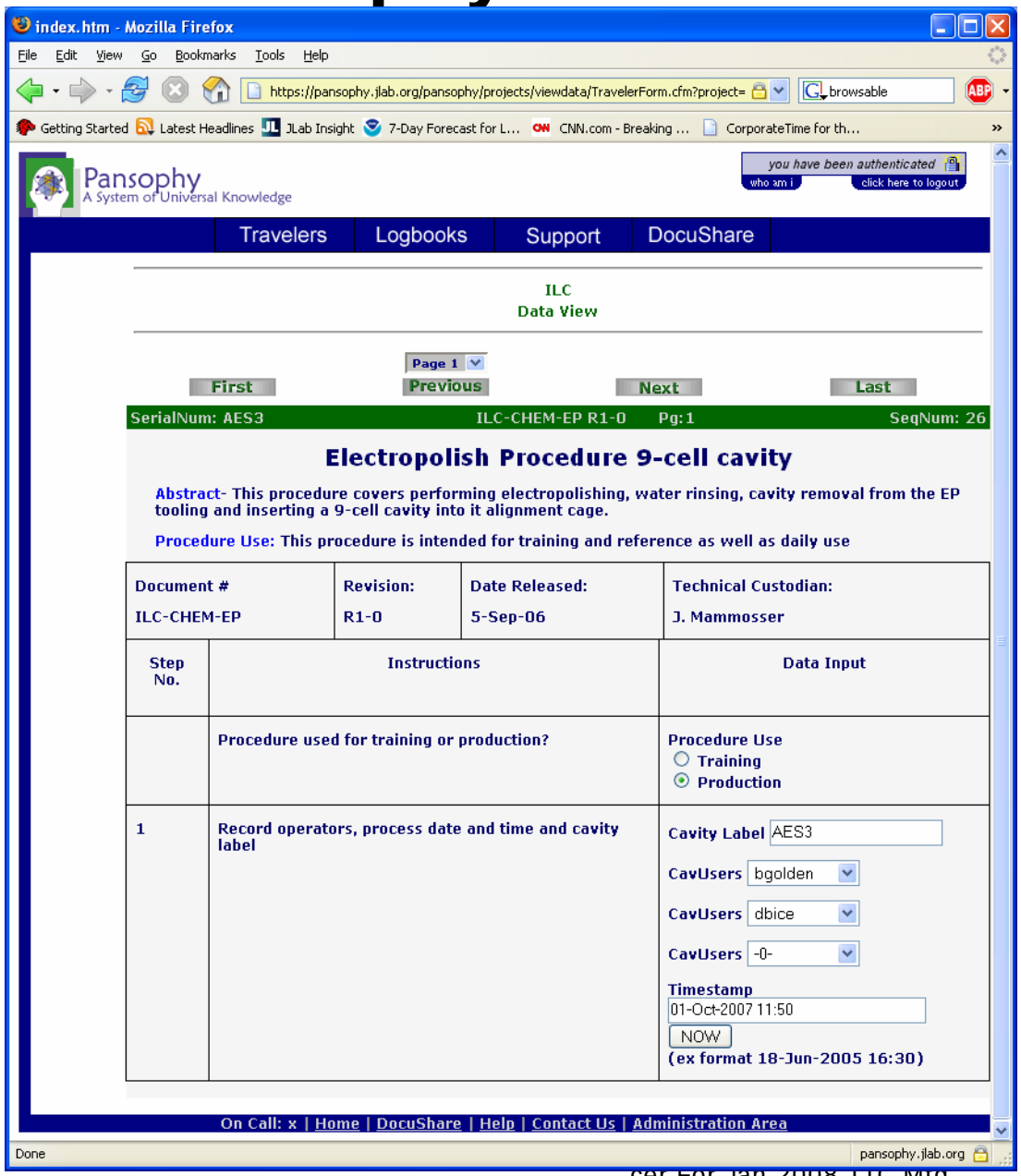
Example:

ILC EP Traveler
AES3 1 Oct 2007
Page 1



cer For Jan 2008 TTC Mtg

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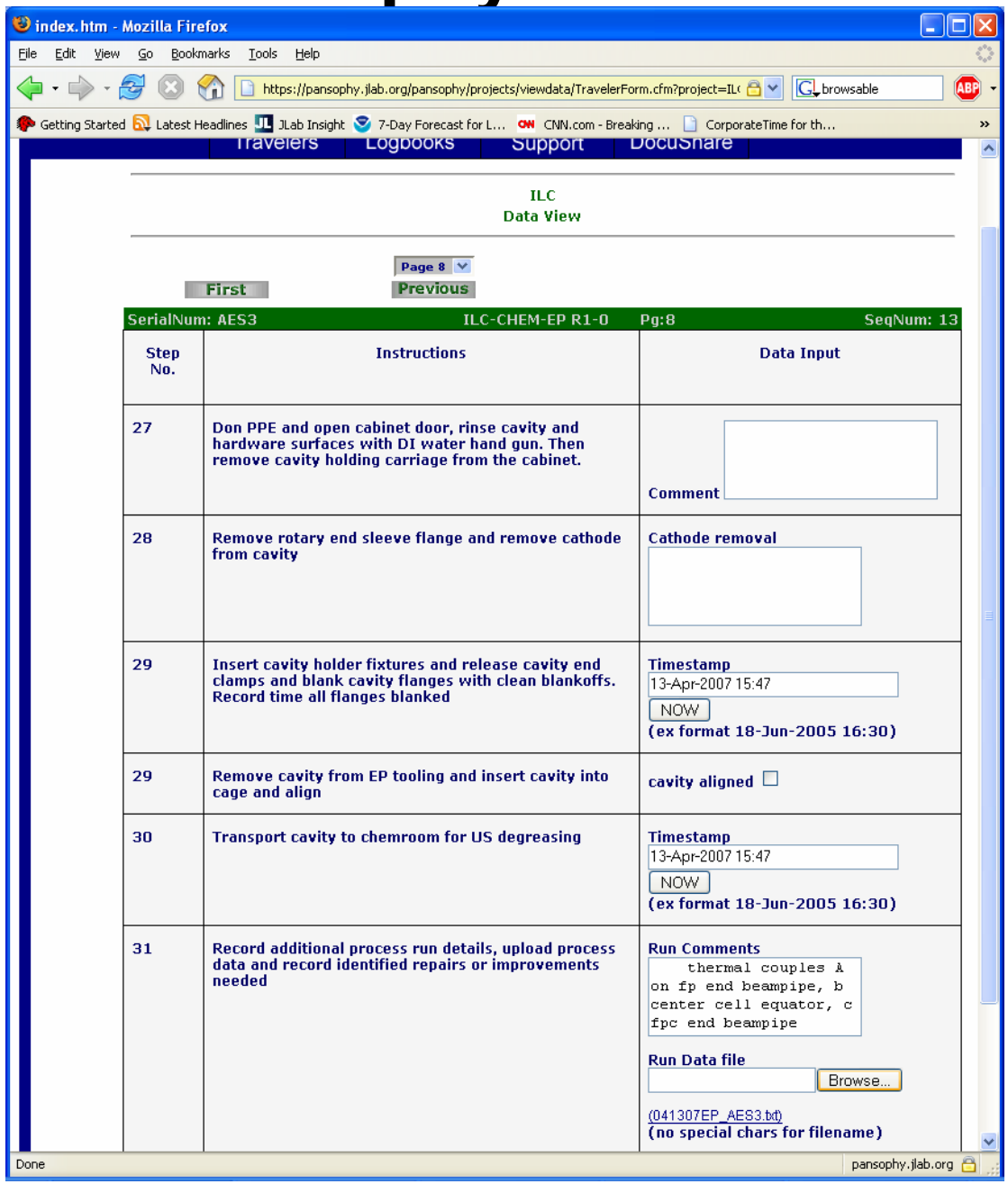
Example:

ILC EP Traveler
AES3 13 Apr 2007
Page 8



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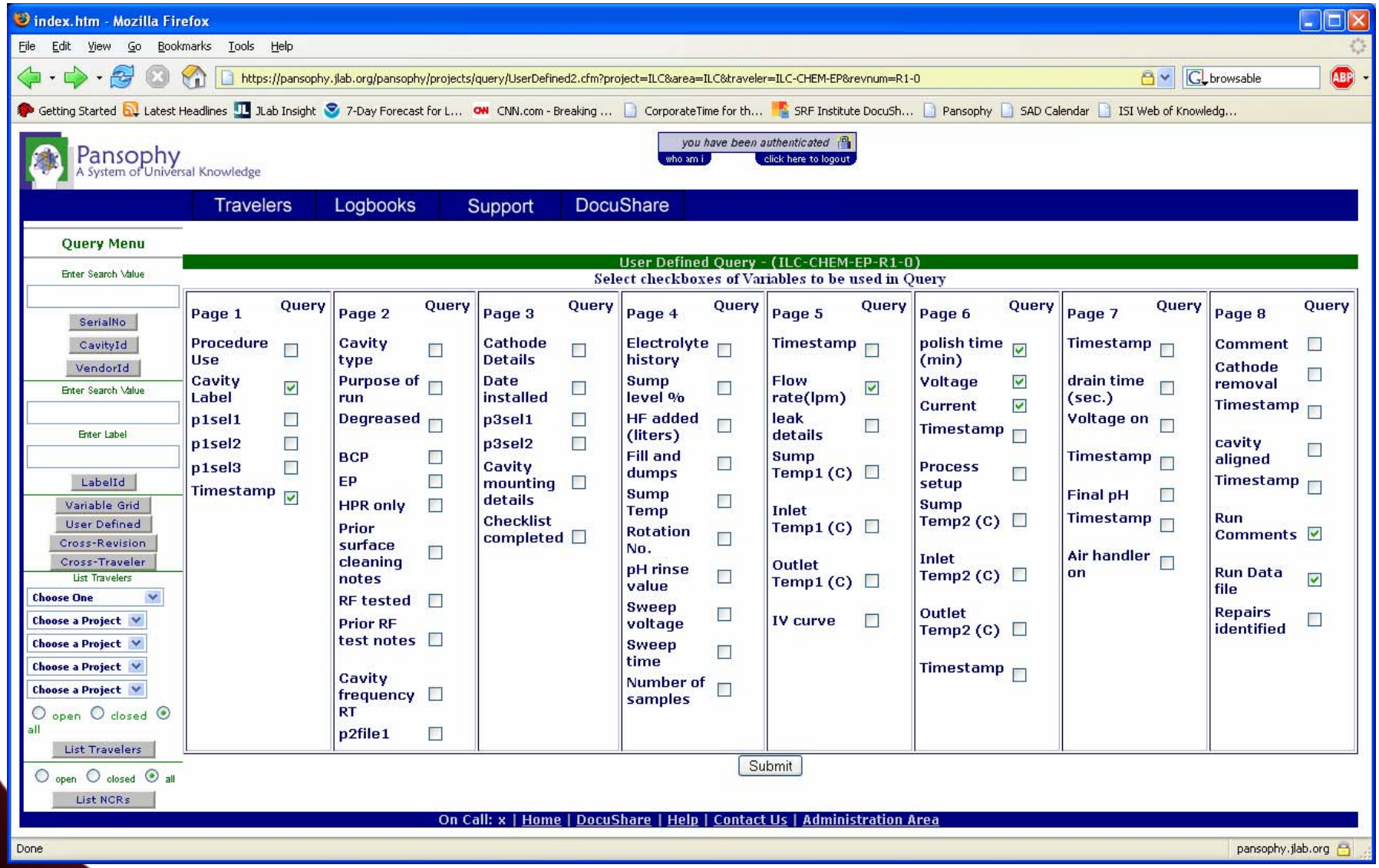
ILC EP Traveler – User-selected query



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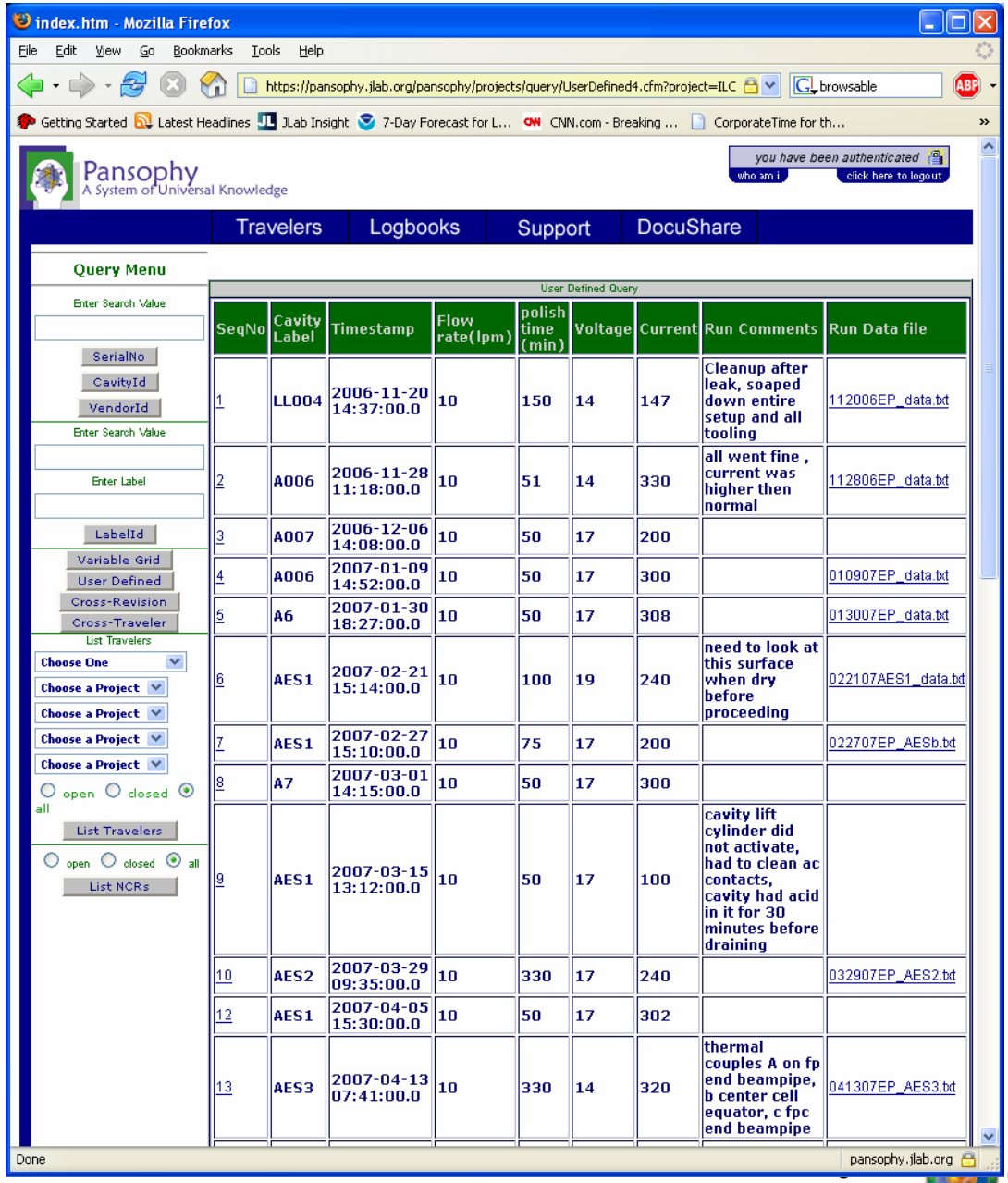
User-selected query

Example:

Response screen to preceeding query

ILC EP Traveler

Entry in “Raw Data file” column is hyperlink to data acquired during EP run. User does what (s)he likes with in in e.g. Excel.



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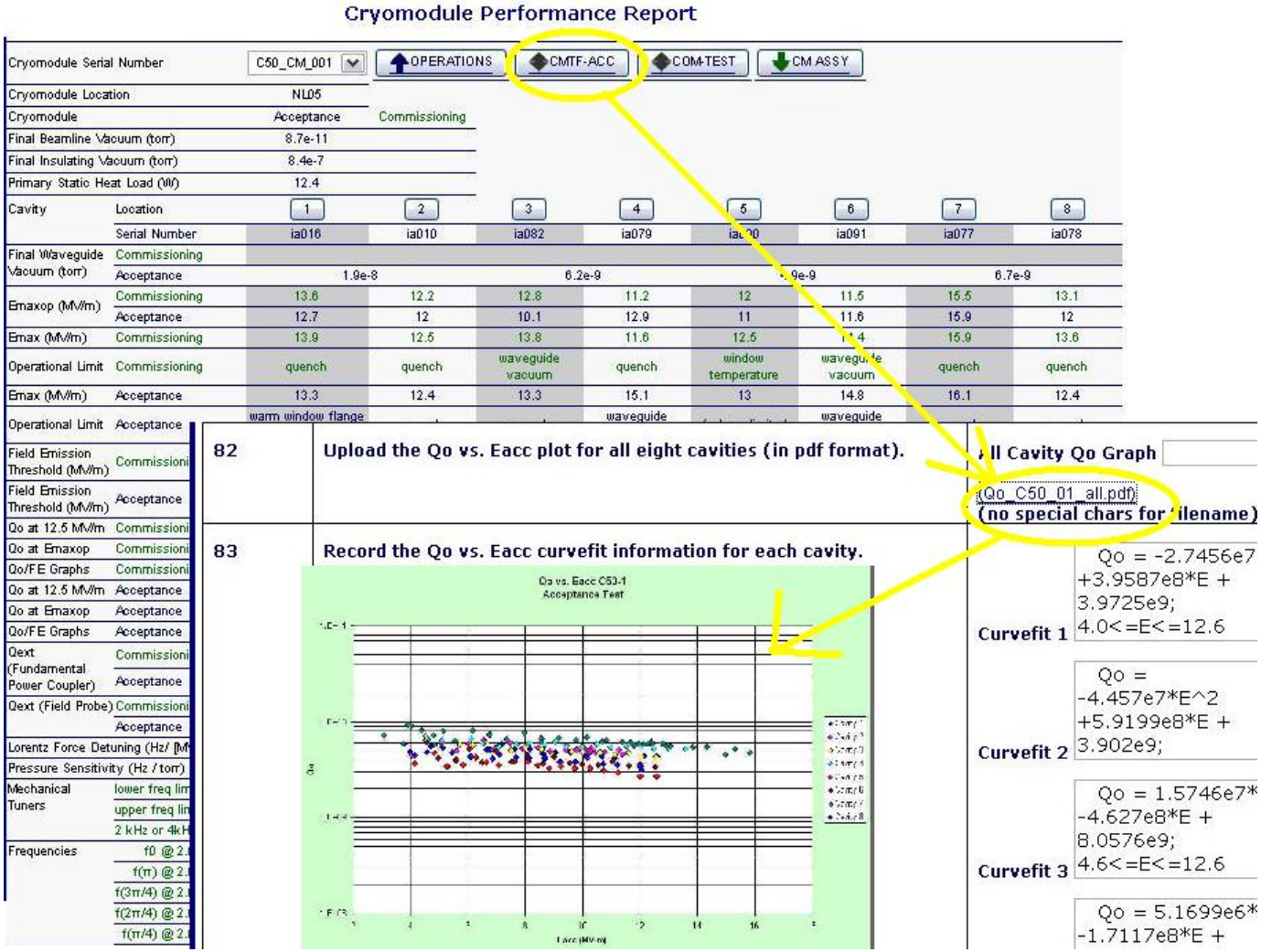
Reports

- C50 examples – summary tables link to lower details



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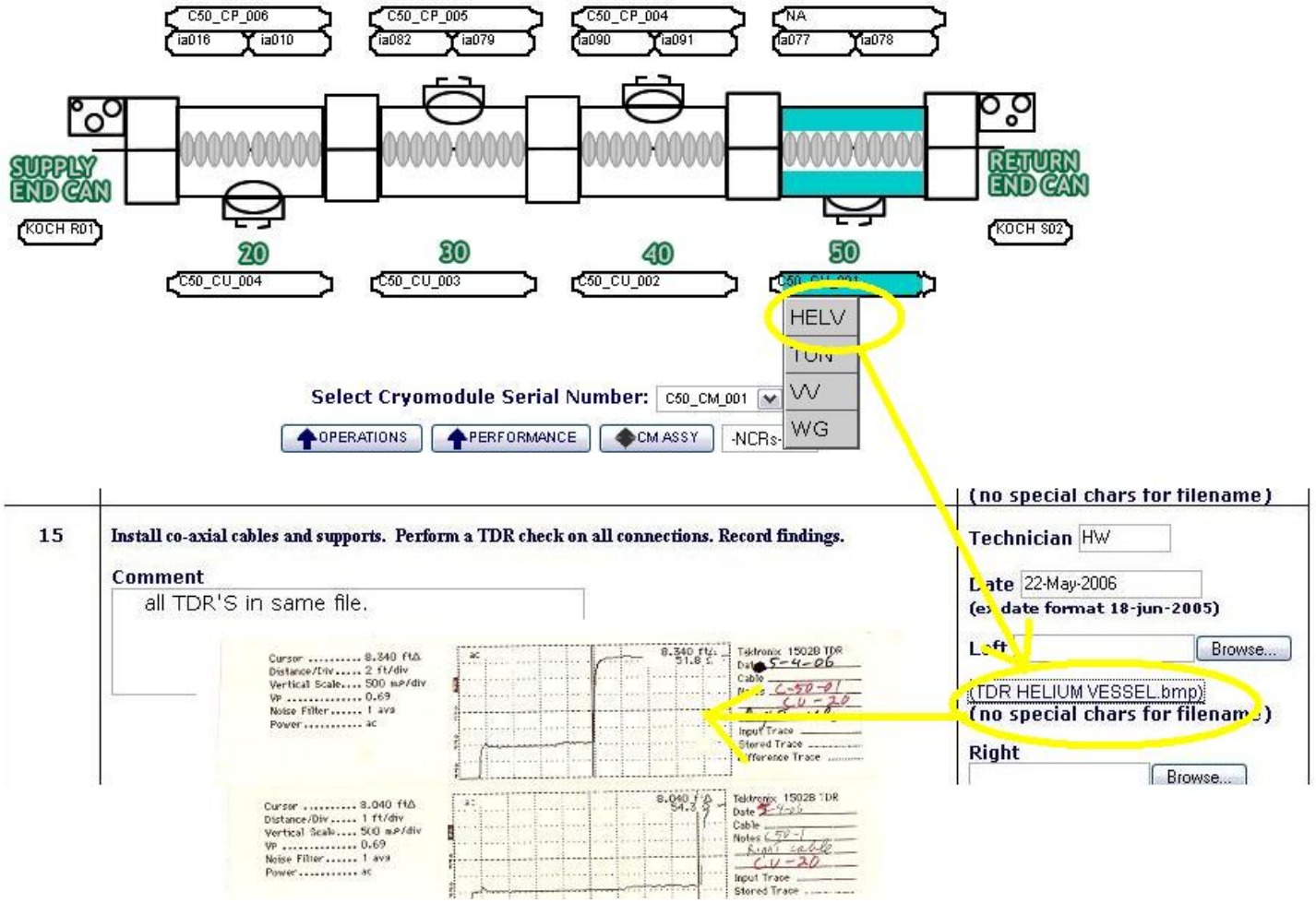
Reports

- **C50 examples** – reports enable “drill down” from completed assembly to smallest detail of traveler.



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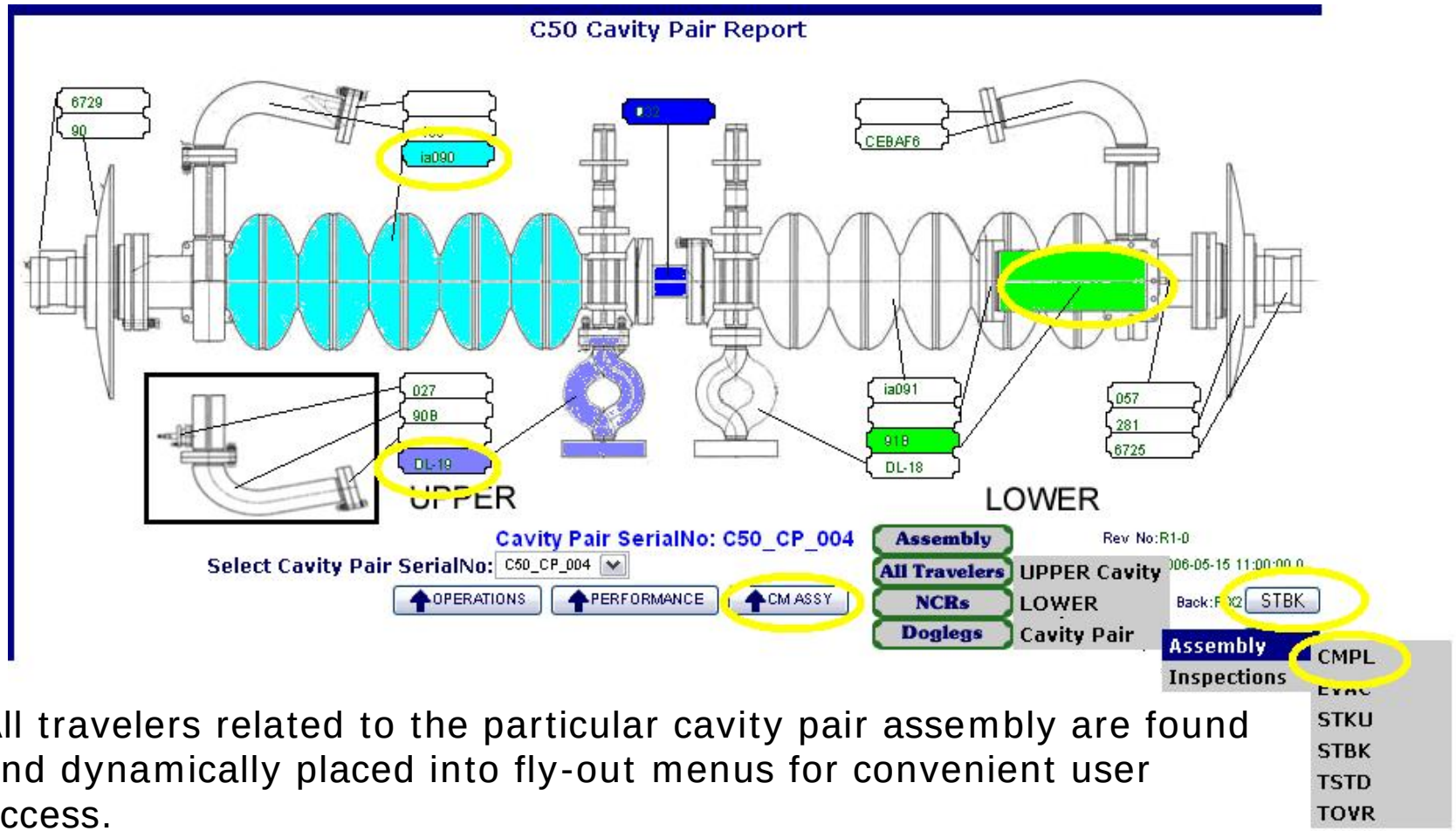
Reports

- C50 examples – dynamic navigation with imbedded queries



All travelers related to the particular cavity pair assembly are found and dynamically placed into fly-out menus for convenient user access.

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Reports

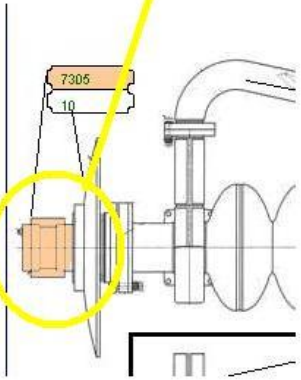
- **C50 examples** – mouse-over component leads to assembly traveler, leads to leak check detail, all from live queries

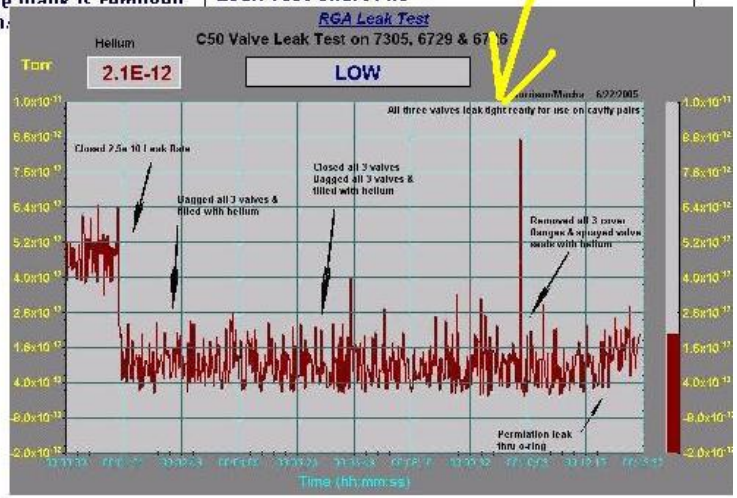
SerialNum: 7305 C50-CPR-ASSY-ENDD1 R1-0 SeqNum: 7

Dish and Valve Sub-Assembly Traveler

Abstract- The purpose of this traveler is to capture data about the sub-assembly process of the dish and valve assembly. This will also provide a place to capture leak testing data.

Step No.	Instructions	Data Input
1	Clean Valve components for ultra high vacuum as per procedure #CP-C-50CU LV-CLN Bake-out valve components as per procedure #11151-A-9.10.2 Assemble and leak test MDC valve using procedure #11151-A-9.10.4 Note: When assembling the valve onto the manifold for leak test, ensure the seal plate is on the blank side of the valve. In other words pump on the guts of the valve so when the blank is removed air pressure is trying to push the seal plate open.	SerialNo 7305 Valve Serial Number Upload File Browse... (C50 Valve Leak Test on 7305, 6729 & 6726.jpg) (no special chars for filename) Leak Test Chart File





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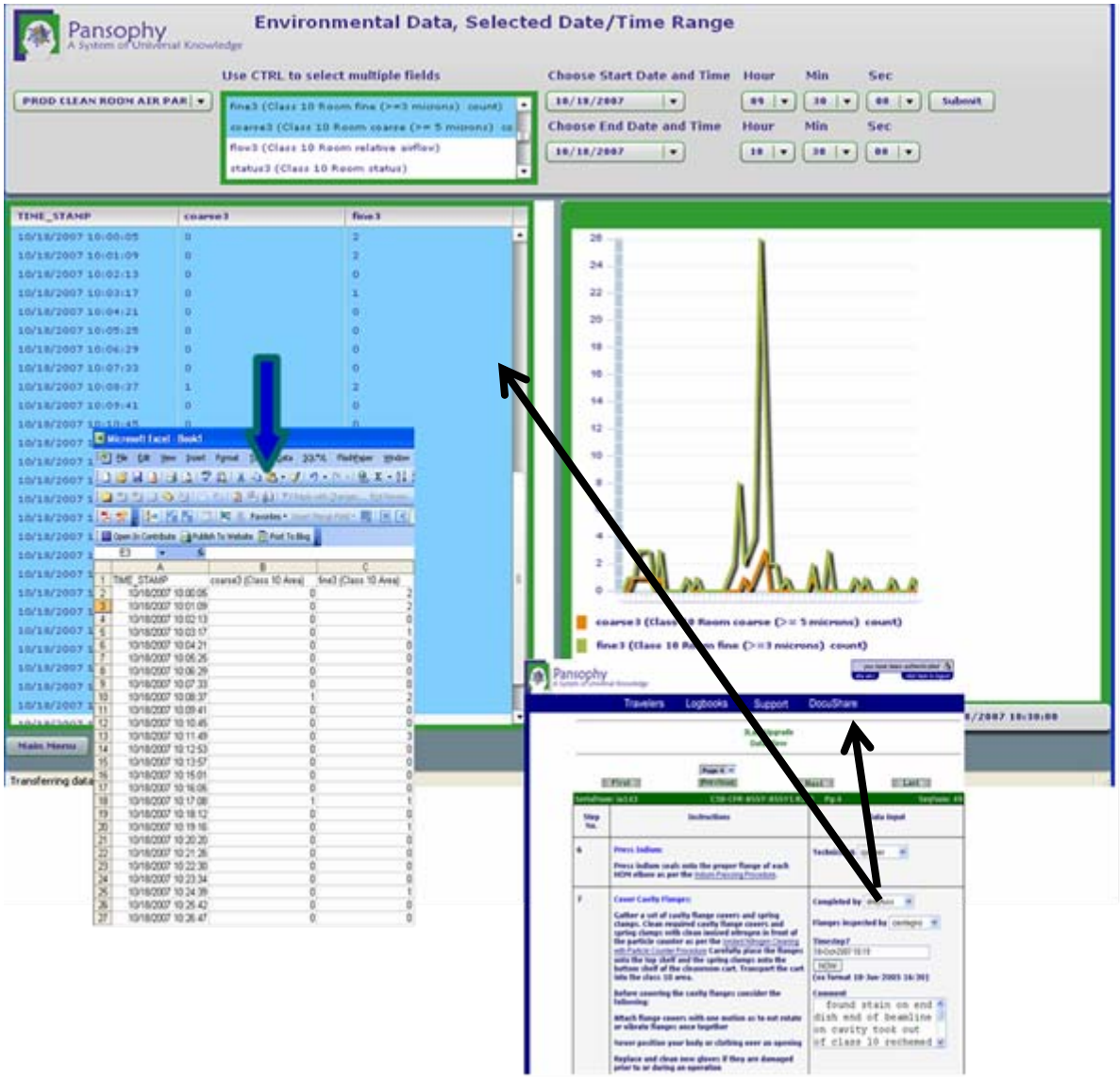
Correlations with Environmental Data

Background logged data can be associated with a particular operation via time stamps in travelers.

Example:

Correlation of Traveler data with Cleanroom Air Particle Data



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Comments from use:

- There is no substitute for clear, thoughtful work planning that is subsequently captured in the traveler composition.
- This is the hardest work.
- Else, GIGO.
- Technology now makes access to data very easy, provided it is thoughtfully constructed.
- *Pansophy* puts the burden of “thoughtfulness” on the responsible scientist or process engineer composing the traveler, the rest is relatively easy and efficient.
- The Pansophy system is primarily a toolkit placed in the hands of the technical staff.

- Essentially **all** of the development and implementation of the Pansophy toolkit has been accomplished by two persons: Valerie Bookwalter and Bonnie Madre. Hiding the sweat, they make it look easy.

Pansophy

- “A System for Managing Critical Knowledge for Accelerator Subsystems: *Pansophy*,” C. Reece, V. Bookwalter and B. Madre, PAC2001.
- “The Jefferson Lab Quality Assurance Program for the SNS Superconducting Linac Accelerator Project,” J. P. Ozelis, PAC2003.
- “Utilization of Integrated Process Control, Data Capture and Data Analysis in Construction of Accelerator Systems,” V. Bookwalter, B. Madre, J. P. Ozelis, C. Reece,“ PAC2003.
- "The Use of Integrated Electronic Data Capture and Analysis for Accelerator Construction and Commissioning: *Pansophy* from the SNS Towards the ILC," Bookwalter, V.; Madre, B.; Ozelis, J.P.; Reece, C.E., PAC2005.
- “Flexible application of the JLab *Pansophy* Information System for Project Reports, Process Monitoring, and R&D Sample Tracking,” V. Bookwalter, B. Madre, C. Reece,“ SRF2007.