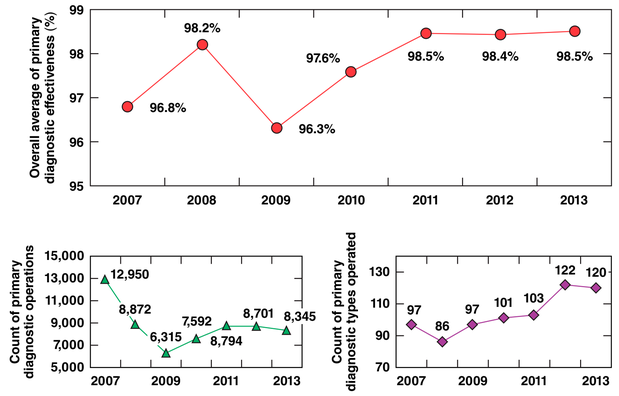
Diagnostic Effectiveness and Availability at the Omega Laser Facility

G. PIEN, W. J. ARMSTRONG, and M. LABUZETA
University of Rochester, Laboratory for Laser Energetics

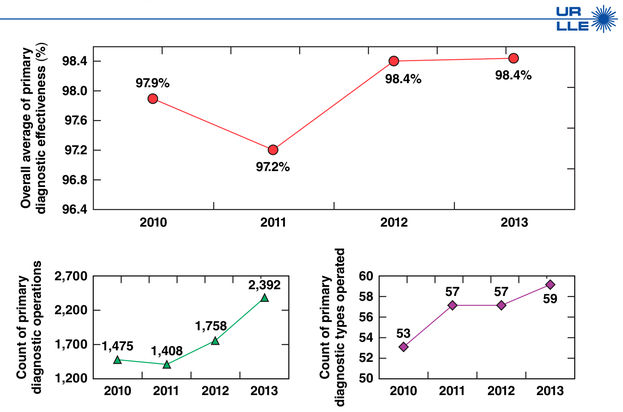
Diagnostic effectiveness

Diagnostic average effectiveness above the 95% requirement was delivered on OMEGA-60



G10142

High diagnostic average effectiveness was maintained while increasing the number of primary diagnostic operations on OMEGA EP



G10143

Diagnostic availability

LLE will begin reporting diagnostic availability in FY 2014

- Diagnostic availability data will be reported for each diagnostic in each facility
- Diagnostic availability reports will reference the proposed configurations approved for each campaign by the Facility Advisory Scheduling Committee (FASC)
- Diagnostic availability reports will inform risk prediction based decisions for users
- Diagnostic availability reports will guide improvement effort decisions for managers
- This change will formalize and measure the relationship between the configurations approved by the FASC during the proposal review process and actual shot configurations

G10170

Two availability measures will be reported for each diagnostic on each system

- Availability for each diagnostic will be reported as

$$A_{diag} = \frac{\sum shots_{requested\ and\ operated}}{\sum shots_{requested}}$$

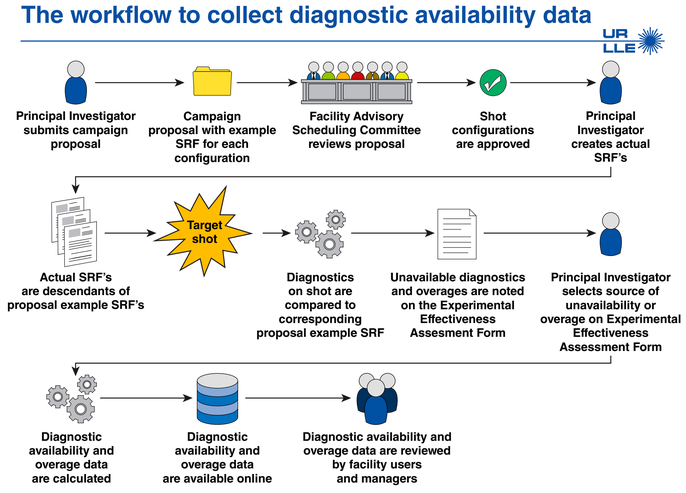
- Overage, the count of operations that were not requested on the original Shot Request Form (SRF), for each diagnostic will be reported as

$$O_{diag} = \sum shots_{actual} - \sum shots_{requested}$$

- Where
  - $shots_{requested\ and\ operated}$ is the total count of shots taken where the diagnostic is specified on the original (reference) SRF and is operated
  - $shots_{requested}$ is the total count of shots taken where the diagnostic is specified on the original (reference) SRF
  - $shots_{actual}$ is the total count of shots where the diagnostic is operated

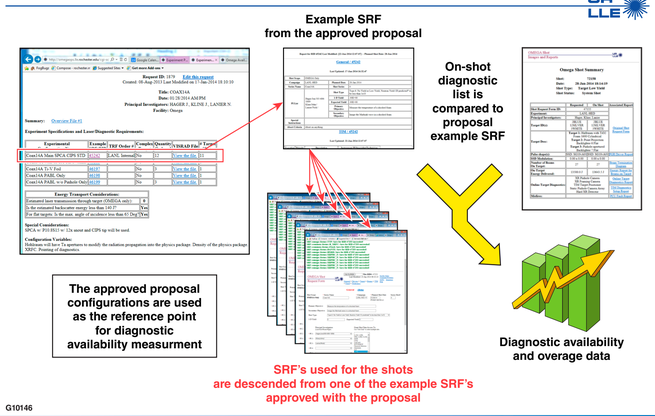
G10144

The workflow to collect diagnostic availability data



G10145

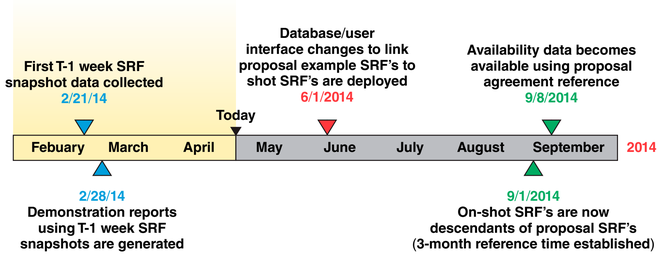
All Shot Request Form's (SRF's) used for shots will be descendants of one of the campaign proposal's example



G10146

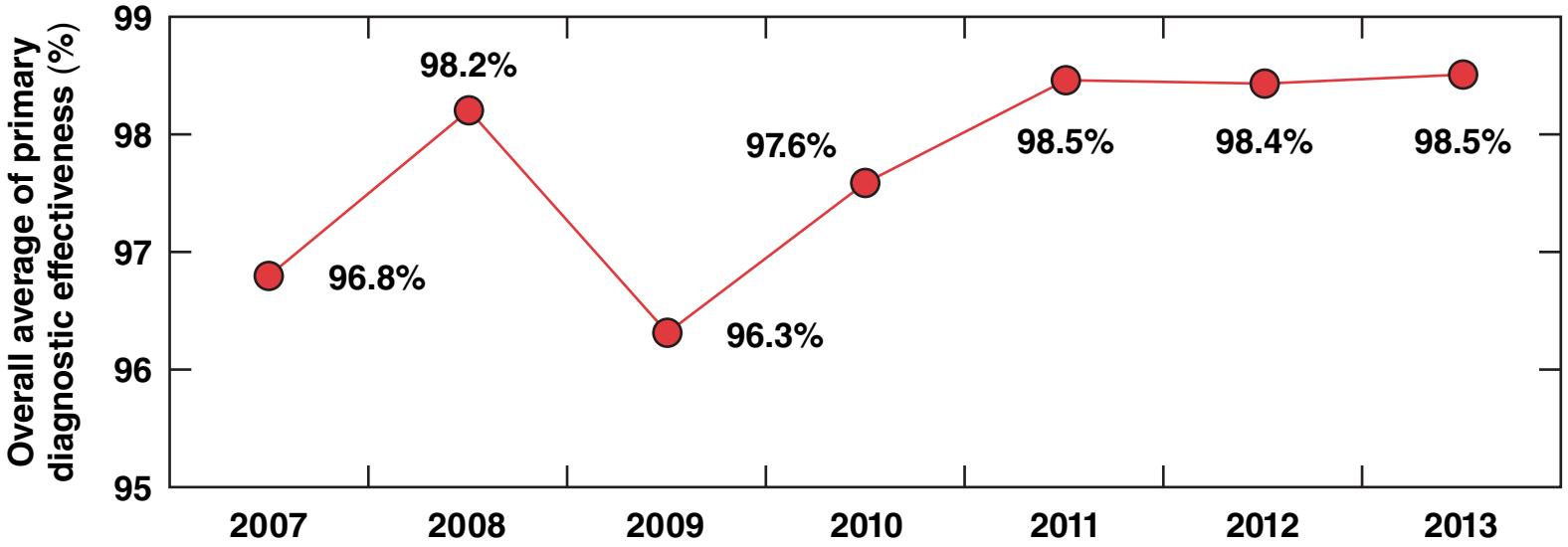
The diagnostic availability system will be deployed in FY 14

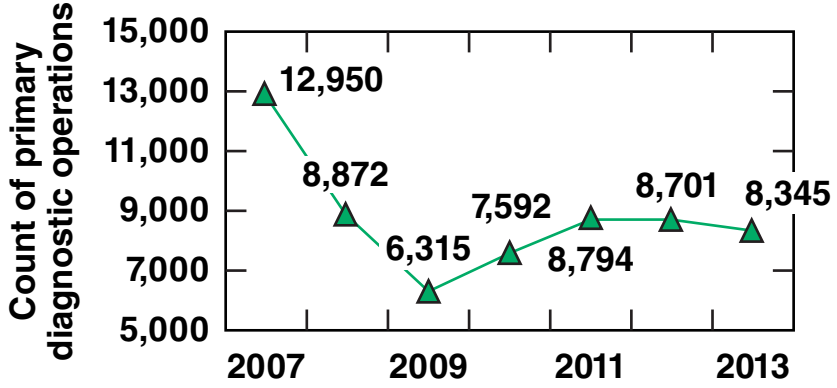
- Actual SRF's will be descendants of the approved proposal SRF's starting on 1 September 2014
- Diagnostic availability data will be published starting on 8 September 2014

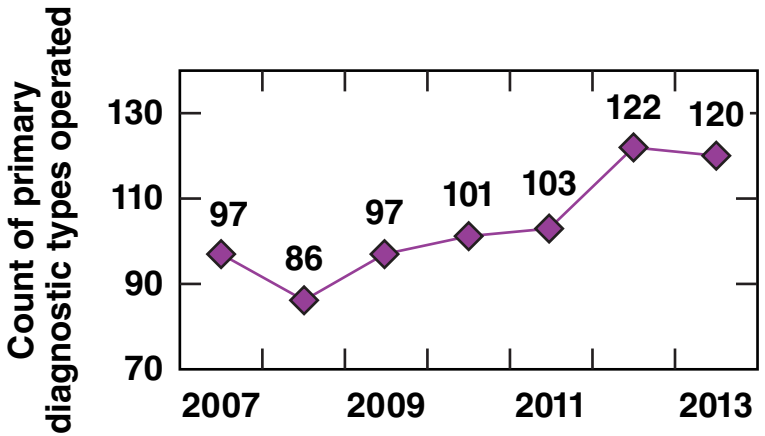


G10171

Diagnostic average effectiveness above the 95% requirement was delivered on OMEGA-60

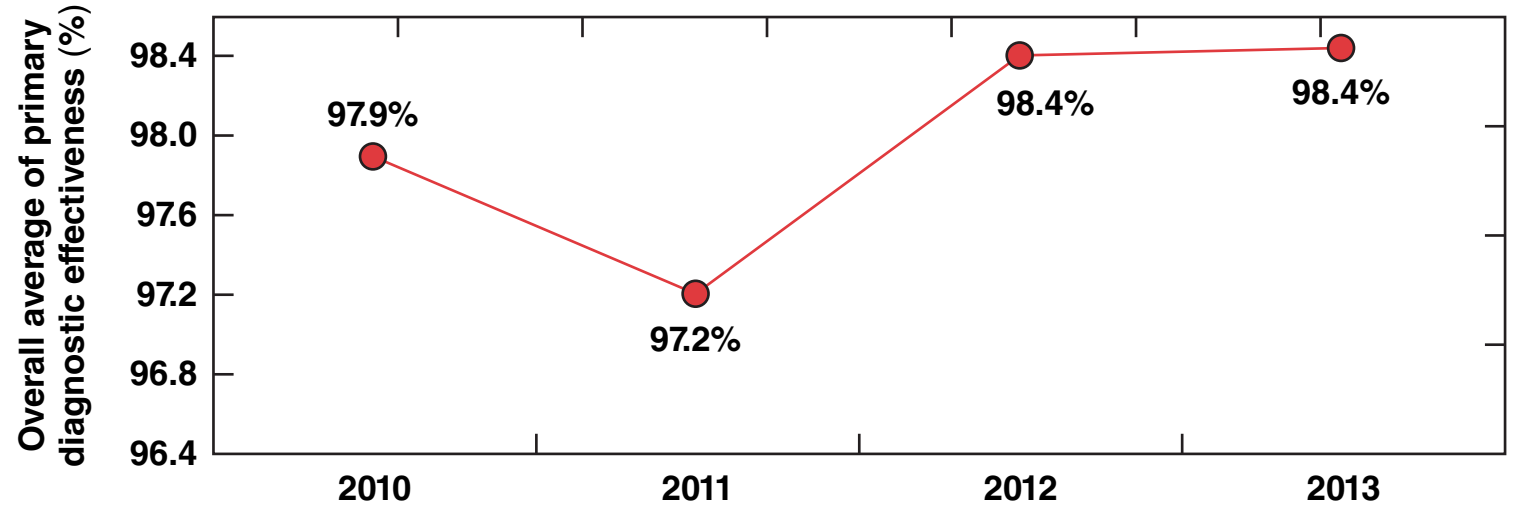


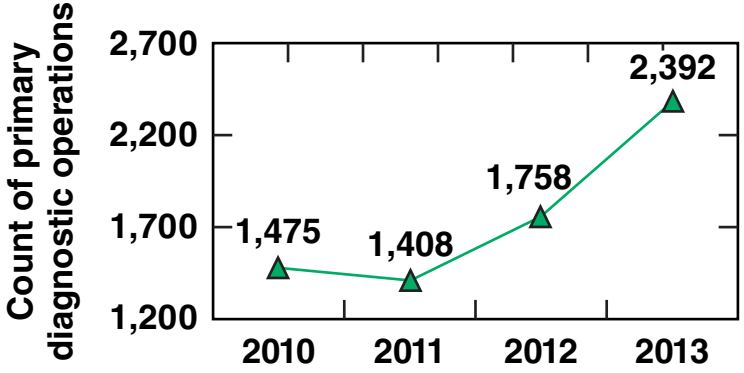


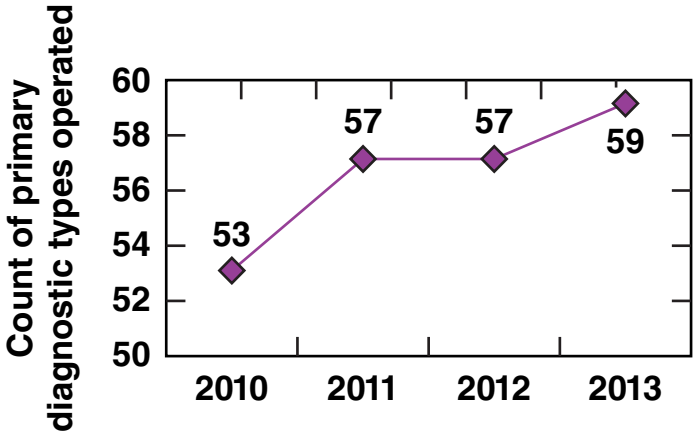


G10142

High diagnostic average effectiveness was maintained while increasing the number of primary diagnostic operations on OMEGA EP







G10143

LLE will begin reporting diagnostic availability in FY 2014

UR LLE

- Diagnostic availability data will be reported for each diagnostic in each facility
- Diagnostic availability reports will reference the proposed configurations approved for each campaign by the Facility Advisory Scheduling Committee (FASC)
- Diagnostic availability reports will inform risk prediction based decisions for users
- Diagnostic availability reports will guide improvement effort decisions for managers
- This change will formalize and measure the relationship between the configurations approved by the FASC during the proposal review process and actual shot configurations

Two availability measures will be reported for each diagnostic on each system

- Availability for each diagnostic will be reported as

$$A_{diag} = \frac{\sum shots_{requested\ and\ operated}}{\sum shots_{requested}}$$

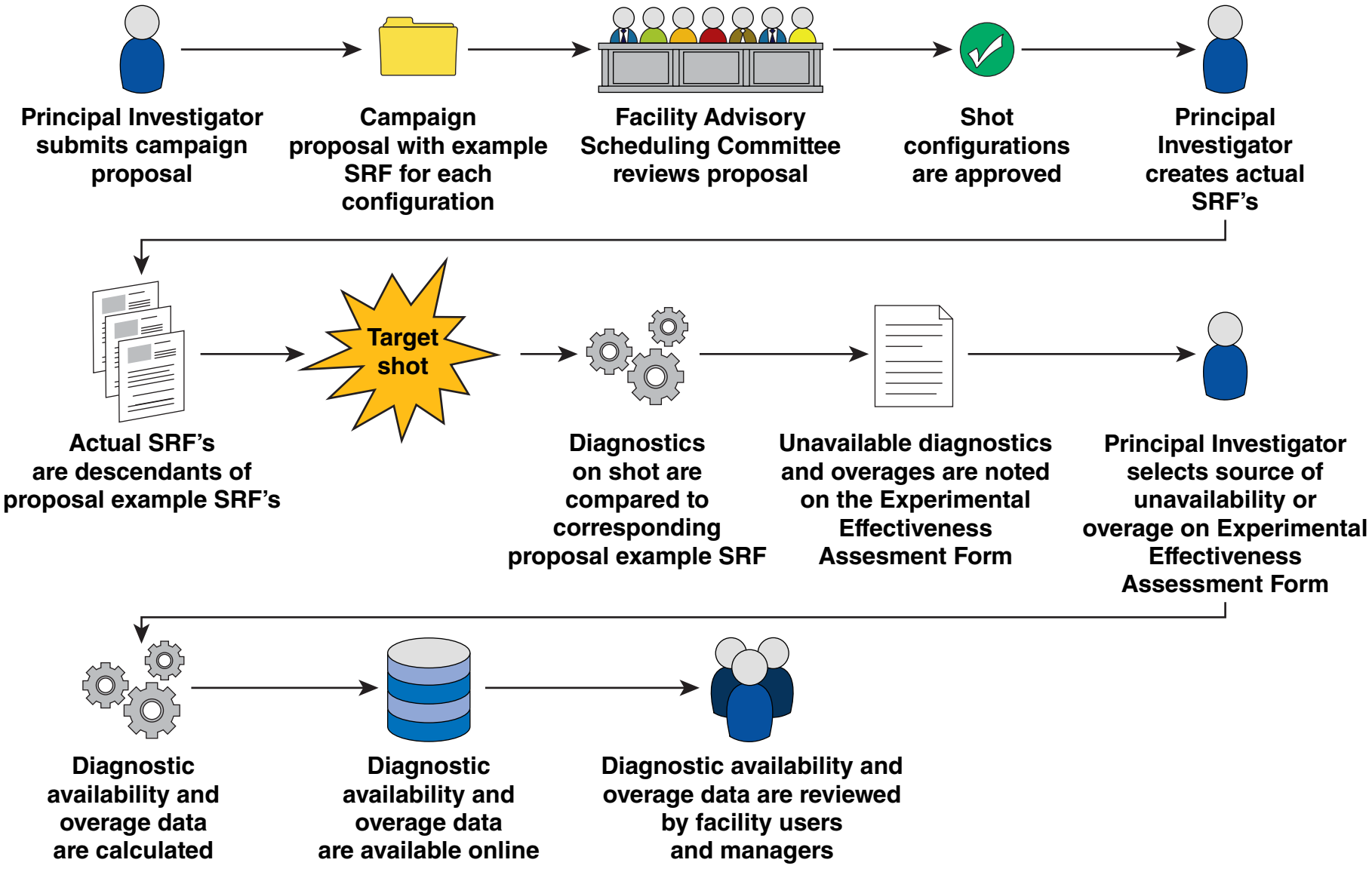
- Overage, the count of operations that were not requested on the original Shot Request Form (SRF), for each diagnostic will be reported as

$$O_{diag} = \sum shots_{actual} - \sum shots_{requested}$$

- Where
  - $shots_{requested\ and\ operated}$ is the total count of shots taken where the diagnostic is specified on the original (reference) SRF and is operated
  - $shots_{requested}$ is the total count of shots taken where the diagnostic is specified on the original (reference) SRF
  - $shots_{actual}$ is the total count of shots where the diagnostic is operated

G10144

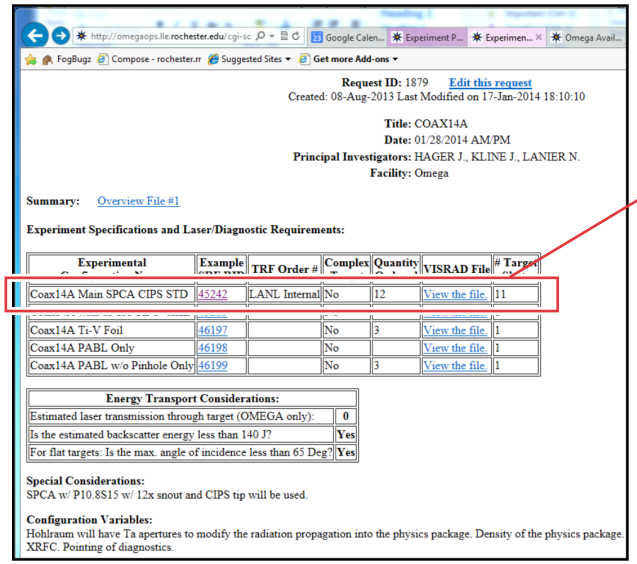
The workflow to collect diagnostic availability data



G10145

All Shot Request Form's (SRF's) used for shots will be descendants of one of the campaign proposal's example

Example SRF from the approved proposal



Request ID: 1879 Edit this request
Created: 08-Aug-2013 Last Modified on 17-Jan-2014 18:10:10

Title: COAX14A
Date: 01/28/2014 AM/PM
Principal Investigators: HAGER J., KLINE J., LANIER N.
Facility: Omega

Summary: Overview File #1

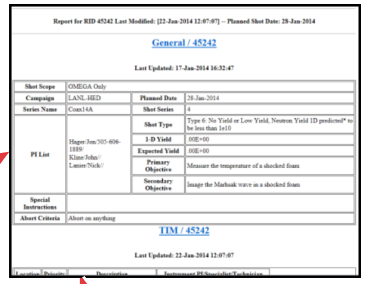
Experiment Specifications and Laser/Diagnostic Requirements:

Experimental	Example	TRF Order #	Complex	Quantity	VISRAD File	# Target
Coax14A Main SPCA CIPS STD	45242	LANL Internal	No	12	View the file.	11
Coax14A Ti-V Foil	46197		No	3	View the file.	1
Coax14A PABL Only	46198		No		View the file.	1
Coax14A PABL w/o Pinhole Only	46199		No	3	View the file.	1

Energy Transport Considerations:	
Estimated laser transmission through target (OMEGA only):	0
Is the estimated backscatter energy less than 140 J?	Yes
For flat targets: Is the max. angle of incidence less than 65 Deg?	Yes

Special Considerations:
SPCA w/ P10.8S15 w/ 12x snout and CIPS tip will be used.

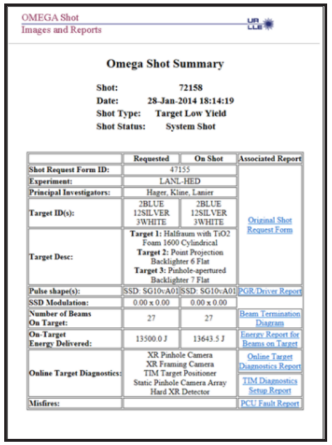
Configuration Variables:
Hohlraum will have Ta apertures to modify the radiation propagation into the physics package. Density of the physics package. XRFC. Pointing of diagnostics.



General / 45242

TIM / 45242

On-shot diagnostic list is compared to proposal example SRF



OMEGA Shot Images and Reports

Omega Shot Summary

Shot: 72158
Date: 28-Jan-2014 18:14:19
Shot Type: Target Low Yield
Shot Status: System Shot

	Requested	On Shot	Associated Report
Shot Request Form ID:	47155		
Experiment:	LANL-HED		
Principal Investigators:	Hager, Kline, Lanier		
Target ID(s):	2BLUE 12SILVER 3WHITE	2BLUE 12SILVER 3WHITE	Original Shot Request Form
Target Desc:	Target 1: Hallraum with TiO2 Foam 1600 Cylindrical Target 2: Point Projection Backlighter 6 Flat Target 3: Pinhole-apertured Backlighter 7 Flat		
Pulse shape(s):	SSD SG10-A0	SSD SG10-A0	PQR Driver Report
SSD Modulation:	0.00 x 0.00	0.00 x 0.00	
Number of Beams On Target:	27	27	Beam Termination Diagram
On Target Energy Delivered:	13500.0 J	13643.5 J	Energy Report for Beams on Target
Online Target Diagnostics:	XR Pinhole Camera XR Framing Camera TIM Target Positioner Static Pinhole Camera Array Hard XR Detector		Online Target Diagnostics Report; TIM Diagnostics Setup Report
Misfires:			PCU Fault Report

Diagnostic availability and overage data

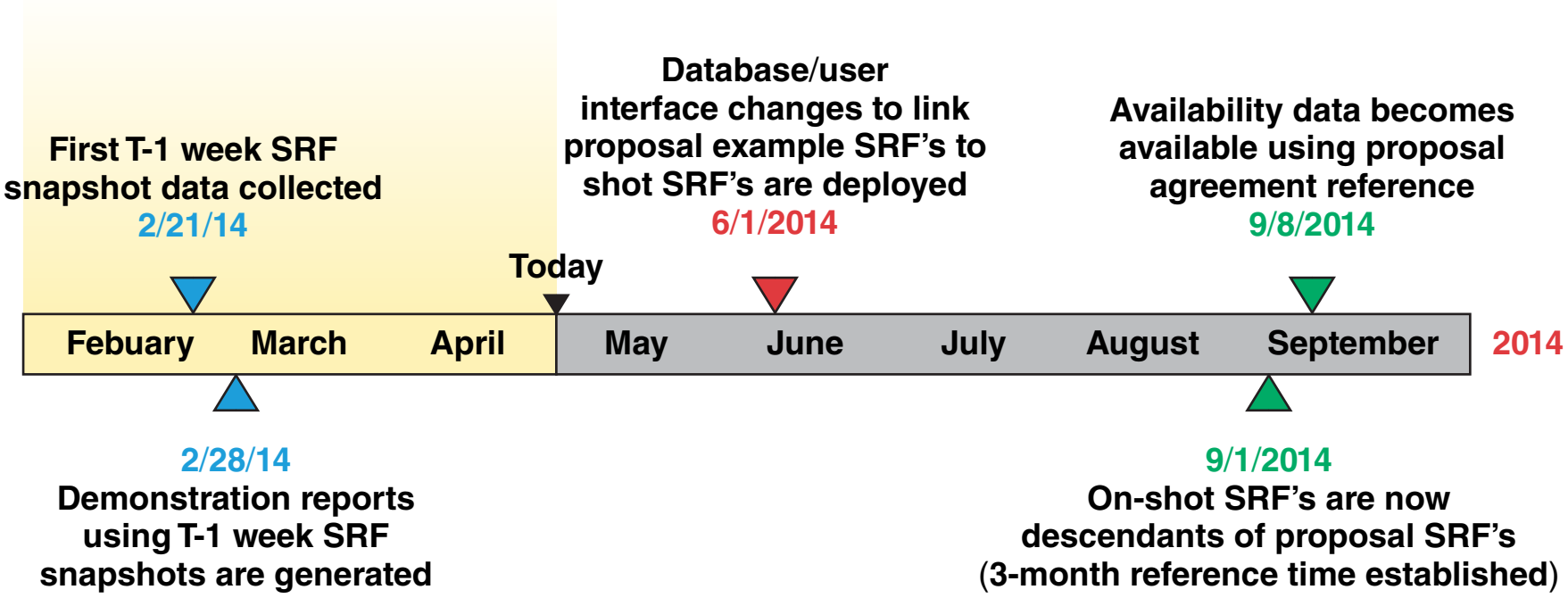
The approved proposal configurations are used as the reference point for diagnostic availability measurment

SRF's used for the shots are descended from one of the example SRF's approved with the proposal

G10146

The diagnostic availability system will be deployed in FY 14

- Actual SRF's will be descendants of the approved proposal SRF's starting on 1 September 2014
- Diagnostic availability data will be published starting on 8 September 2014



G10171