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 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 managers
- 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

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

The workflow to collect diagnostic availability data

1. Principal Investigator submits campaign proposal
2. Campaign proposal is reviewed
3. Campaign proposal is approved
4. Principal Investigator submits SRF
5. SRF is used for diagnosis
6. Diagnostic availability and coverage data are collected
7. Diagnostic availability and coverage data are available online

Diagnostic availability system

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

- Availability for each diagnostic will be reported as
  \[
  \frac{\text{availability}}{\text{availability}} = \frac{\text{on-shot} \sum \text{shots requested} \text{and operated}}{\text{on-shot} \sum \text{shots requested}}
  \]
- Overage, the count of operations that were not requested on the original Shot Request Form (SRF), for each diagnostic will be reported as
  \[
  \frac{\text{overage}}{\text{overage}} = \frac{\text{off-shot} \sum \text{shots actual} \text{and requested}}{\text{off-shot} \sum \text{shots requested}}
  \]
- Where
  - \( \text{shots requested and operated} \) is the total count of shots taken where the diagnostic is specified on the original (reference) SRF and is operated
  - \( \text{shots actual} \) is the total count of shots where the diagnostic is specified on the original (reference) SRF and is operated
  - \( \text{shots requested} \) is the total count of shots where the diagnostic is specified on the original (reference) SRF

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

The approved proposal configurations are used to inform the diagnostic availability measurement

Example SRF from the approved proposal

On-shot SRF is used for the shots are descendants of the approved proposal SRF’s approved with the proposal

Diagnostic availability data becomes available using a proposal agreement reference

First T-1 week SRF snapshot data collected

Database user interface changes to link proposal example SRF’s to shot SRF’s are deployed

Availability data becomes available using proposal agreement reference

- Final 3 month reference time established

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

The approved proposal configurations are used in the diagnostic availability measurement

Diagnostic availability data is available online

The approved proposal configurations are used in the diagnostic availability measurement

On-shot SRF's are new descendants of proposal SRF's (3-month reference time established)
Diagnostic average effectiveness above the 95% requirement was delivered on OMEGA-60.
High diagnostic average effectiveness was maintained while increasing the number of primary diagnostic operations on OMEGA EP.
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
Two availability measures will be reported for each diagnostic on each system

- **Availability** for each diagnostic will be reported as

\[
A_{\text{diag}} = \frac{\sum \text{shots}_{\text{requested and operated}}}{\sum \text{shots}_{\text{requested}}}
\]

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

\[
O_{\text{diag}} = \sum \text{shots}_{\text{actual}} - \sum \text{shots}_{\text{requested}}
\]

- Where
  - \(\text{shots}_{\text{requested and operated}}\) is the total count of shots taken where the diagnostic is specified on the original (reference) SRF and is operated
  - \(\text{shots}_{\text{requested}}\) is the total count of shots taken where the diagnostic is specified on the original (reference) SRF
  - \(\text{shots}_{\text{actual}}\) is the total count of shots where the diagnostic is operated
The workflow to collect diagnostic availability data

1. **Principal Investigator** submits campaign proposal
2. **Campaign proposal with example SRF for each configuration**
3. **Facility Advisory Scheduling Committee** reviews proposal
4. **Shot configurations are approved**
5. **Principal Investigator creates actual SRF’s**

- **Actual SRF’s are descendants of proposal example SRF’s**

6. **Target shot**
7. **Diagnostics on shot are compared to corresponding proposal example SRF**
8. **Unavailable diagnostics and overages are noted on the Experimental Effectiveness Assessment Form**
9. **Principal Investigator selects source of unavailability or overage on Experimental Effectiveness Assessment Form**

- **Diagnostic availability and overage data are calculated**
- **Diagnostic availability and overage data are available online**
- **Diagnostic availability and overage data are reviewed by facility users and managers**
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

On-shot diagnostic list is compared to proposal example SRF

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

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

Diagnostic availability and overage data
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

- First T-1 week SRF snapshot data collected 2/21/14
- Today
- Database/user interface changes to link proposal example SRF’s to shot SRF’s are deployed 6/1/2014
- Availability data becomes available using proposal agreement reference 9/8/2014
- 2/28/14 Demonstration reports using T-1 week SRF snapshots are generated
- 9/1/2014 On-shot SRF’s are now descendants of proposal SRF’s (3-month reference time established)