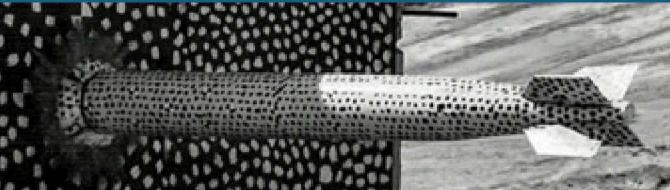


# Measurement Technology Subgroup Round Robin Gage Update - Spring 2019 - AWE



SAND2019-2542PE



*PRESENTED BY*

Robert Jones



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## IMOG Round Robin Gage

- Status of the Gage
  - Goals
  - Sites that have performed measurements or are in-progress
  - Sites remaining that have agreed to participate
  - Sites not listed that would like to participate
- Simulated data package and comparison
- Questions?

## IMOG Round Robin Gage

- Our desired outcome is to
  - Collect sufficient data from each site to make comparison between
    - Various CMM's used
    - Measurement strategies
    - Data evaluations to ASME Y14.5
      - What the native CMM software used is reporting
      - How the native CMM is reporting for the features of interest
  - Attempt to compare the results in a blind comparison.
  - Compare sites results using a common software

In the following slides are examples of our requested information pertaining to the measurement of the gage.

## IMOG Round Robin Gage

Several sites have already measured the gage and have returned data packages.

Already contributed

Lawrence Livermore National Laboratories

Sandia National Laboratories Livermore

Sandia National Laboratories Albuquerque

Mechanical Calibration

Manufacturing Liaison

Mission Support and Test Service, Nevada

The gage is currently being measured at  
Los Alamos National Laboratory

## IMOG Round Robin Gage

Several sites are still waiting to measure the gage

**Kansas City National Security Campus**

**Y-12 National Security Complex**

**Savannah River National Labs**

**Atomic Weapons Enterprise**

Other potential Candidates? If so please let me, or Tony Bryce know.

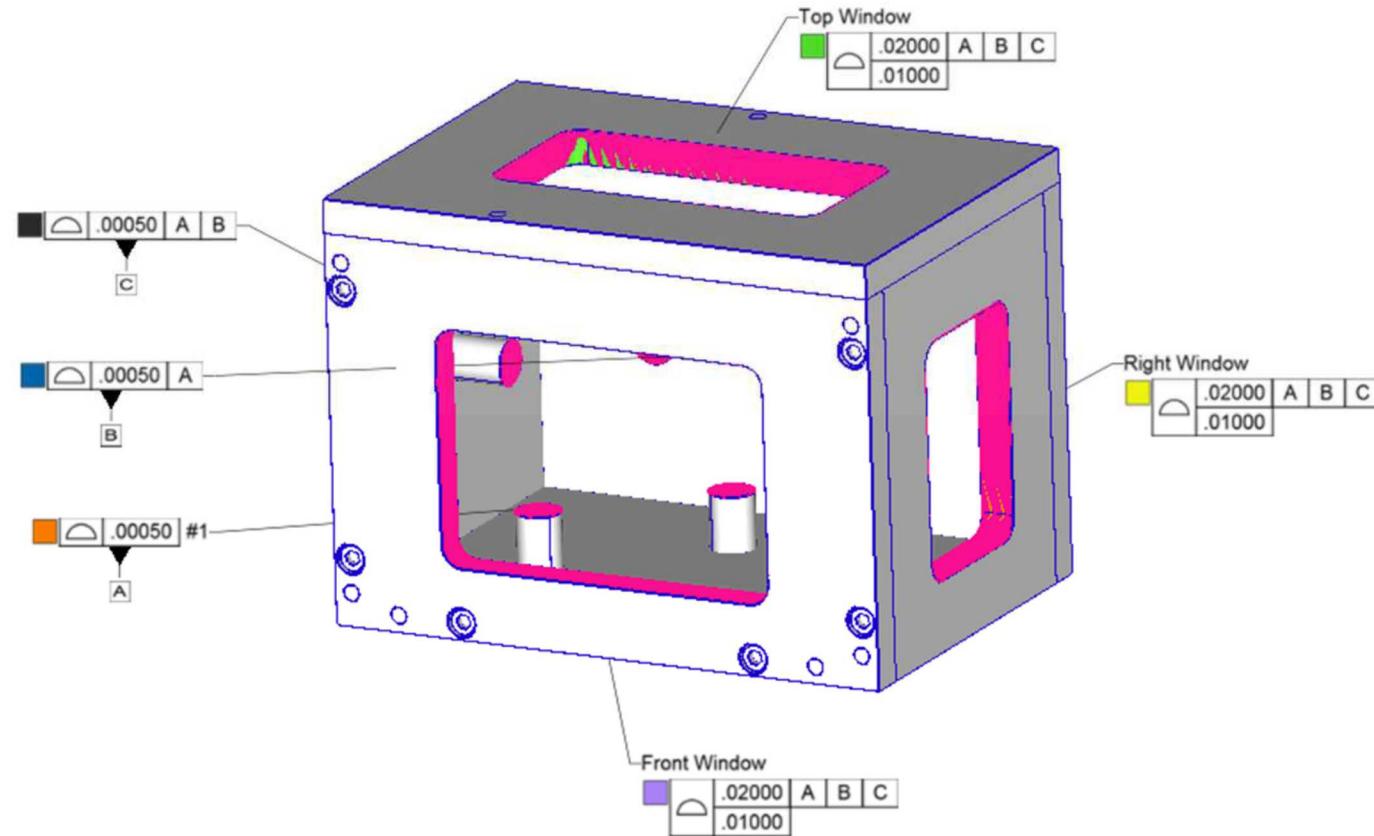
# IMOG Round Robin Gage

- Report methodology per participant site's normal process
- Contact information for delivery of Round Robin gage
- Would like to receive from each participant if possible the following information-
  - X, Y, Z, i, j, k measured points (i.e. surface point data)
  - Measured surface points of all datums along with profile measurements
  - Follow participant's site process to provide information (e.g. E-mail, CD file transfer)
- Units of measure of the data
- Effective probe tip diameter
- Software (e.g. name and version) being used on CMM actual profile measurement value result
- Certified CMM specification or accuracy

| DIMENSION | DESCRIPTION                    | ON CMM AS MEASURED | UNIT OF MEASURE | EFFECTIVE PROBE DIAMETER & MATERIAL | BALL CENTER or SURFACE POINTS | SCAN POINTS or SINGLE POINTS | MACHINE MODEL and SOFTWARE   | CMM Specification           | METROLOGIST/ FACILITY | UNITS OF EXPORTED POINTS |
|-----------|--------------------------------|--------------------|-----------------|-------------------------------------|-------------------------------|------------------------------|--|-----------------------------|-----------------------|--------------------------|
| 1         | Profile Datum A                | .00040             | INCH            | 3mm / Ruby                          | Surface                       | Scan                         | Zeiss CMM Prismo 10Ultra Calypso   | MPE = ± 0.5 µm + (L/500) um | Margie Baca/SNL-NM    | Metric                   |
| 2         | Profile Datum B                | .00126             | INCH            | 3mm / Ruby                          | Surface                       | Scan                         | Please send all the point files for all the datums along with all the window features and include the units of the exported points. Please also include the stylus size diameter and if the exported points are surface or ball center data. |                             |                       |                          |
| 3         | Profile Datum C                | .00054             | INCH            | 3mm / Ruby                          | Surface                       | Scan                         |  |                             |                       |                          |
| 4         | Composite Profile Top Window   | -.00300            | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |
|           |                                | .00500             | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |
|           |                                | .00836             | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |
| 5         | Composite Profile Right Window | -.00830            | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |
|           |                                | .00863             | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |
|           |                                | .00721             | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |
| 6         | Composite Profile Front Window | .00630             | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |
|           |                                | .00830             | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |
|           |                                | .00960             | INCH            | 3mm / Silicon Nitrite               | Surface                       | Scan                         |  |                             |                       |                          |

# IMOG Round Robin Gage

In an additional exercise we use a third-party software (i.e. Smart Profile) to determine the results of these data sets in compliance with the Y14.5M-1994.



# IMOG Round Robin Gage

Questions?