**Note: The highly recommended CDEs have been listed below with asterisks (\*) and bolded.**

1. Test Series Information (including one or more Test Shots)
   1. Test Series Number:
   2. Test Series date and time: H M
   3. **\*Charge Descriptions:**
   4. **\*Test Description:**
   5. Distribution Code (OPSEC Determined): A B C D E F
   6. Air temperature: units
   7. Air Pressure: units
   8. Cross Wind Magnitude and Direction:
   9. Pressure Source Description:
   10. Test Review Documentation: Available Not Available
   11. Companion Security Release Form:Required Not Required
   12. Test After Report: Available Not Available
   13. **\*Test Setup Diagrams:**
   14. Document Name:
   15. Document Category: Image Test Report Pre-Test Review
   16. Document Description:
   17. Tags:

Home Made Explosive

Conventional Explosive

Metallized Explosive

Interior

Exterior

Buried Explosive

Air Burst

155mm Muzzle Shock

120mm Mortar Muzzle Shock

81mm Mortar Muzzle Shock

60mm Mortar Muzzle Shock

120mm Tank Muzzle Shock

Shoulder Fired Rocket Air Shock

Behind Armor Air Shock

Near Field

Medium Field

Far Field

Ground Shock

Other, specify:

1. Test Shot (within Test Series)
   1. Individual Test Shot Number:
   2. Test Shot Distribution Level: A B C D E F
   3. Test Shot Designated FOUO Level: UNCLAS FOUO NOFORN SECRET
   4. Date-Time:
   5. Gauge #:
   6. **\*Line of Sight Distance of Gauge to the Target:**
   7. Pressure Data: Yes No
   8. Acceleration Data:Yes No
   9. Pressure Tabular input:
   10. Acceleration Tabular input:
   11. Air Temperature:
   12. Cross Wind Magnitude and Direction:
   13. Pressure Source: gun/explosive type: orientation:

charge weight: charge shape:

* 1. Target Description:
  2. # of Gauges Per Shot:
  3. Pre and Post Shot Images: Not Available Available, Format:
  4. Shot Notes:

1. Gauge Information
   1. Gauge Manufacturer/Model/Number:
   2. Material/Personnel:
   3. Height Above Ground:
   4. Gauge Orientation Angled from North (approximate):
   5. Gauge Orientation Angled from Horizontal (approximate):
   6. Personnel Stance:
   7. **\*Location on Personnel:**
   8. **\*Pressure Time History:**
   9. Pressure Sampling Rate:
   10. Acceleration Time History (G’s vs time):
   11. Acceleration Sampling Rate:
2. Summary Data
   1. Per Shot Peak PSI:
   2. Per Shot Impulse:
   3. Per Shot Duration (positive phase):
   4. Per Shot Number of Peaks:
   5. Per Shot Use of multiple sensors? No Yes, Number of Units:
   6. Per Series Number of exposure events
3. Outcome Measures
   1. Source /type of information:
4. Other Information
   1. Helmet type:
   2. Other PPE

GENERAL INSTRUCTIONS

Note: None of the data elements included on this CRF Module are considered Core (i.e., required for all Biomechanical Devices in TBI studies to collect); rationale for having no required variables is to promote maximal inclusion of relevant exposure data. The data elements noted with an asterisk (\*) on this CRF Module are classified as Supplemental-Highly Recommended (i.e., strongly recommended for Biomechanical Devices in TBI clinical studies to collect). The technology and work to date has leveraged blast overpressure so that has shaped the development of these CDE recommendations. There are alternate methods of recording blast exposure (e.g., optical, acoustic) that have not been used with any regularity in the relevant line of research and are not suitable to use as a source for shaping CDEs at the present time, but should be accommodated in a consolidation of evidence.

The Supplemental-Highly Recommended data elements in blast sensor studies include the following:

Charge Description

Test Description

Test Setup Diagrams (including orientation)

Line of Sight Distance of Gauge to the Target

Gauge Location on Personnel

Gauge Pressure Time History

**\* DATA ELEMENTS ARE SUPPLEMENTAL-HIGHLY RECOMMENDED. ALL OTHER DATA ELEMENTS ARE SUPPLEMENTAL.**

The remaining data elements are considered Supplemental (i.e., non-Core) and should be collected if the research team considers appropriate and feasible for each study.

*[ NOTE. The data elements in this DRAFT CDE CRF do not need to appear in the order seen in this version. ]*

SPECIFIC INSTRUCTIONS

1. Test Series Information (including one or more Test Shots)
   1. Test Series Number: End state is a series numbering system that is centralized and spans across all labs doing relevant work, assigned prior to the conduct of each test series. However, there is not a sufficient mechanisms for that centralization of series numbering at present, so the recommended Test Series identifier is [PI or LAB text identifier] followed by a serial number for work conducted by that lab.
   2. Test Series date and time: \_MM / DD / YYYY ; 24-hour \_ H \_ M\_\_\_\_at start
   3. \*Charge Descriptions: single line free field text\_ [ SEE ALSO Items 1.v. and 2.n. ]
   4. \*Test Description: single line free field text \_
   5. Distribution Code (OPSEC Determined): A,B,C,D,E,F [reference http://www.dtic.mil/dtic/pdf/distribution\_statements\_and\_reasons.pdf ]\_
   6. Air temperature: degrees Celsius measured at beginning of Test Series\_(measurement method not constrained)
   7. Air Pressure: any standardized measure at beginning of Test Series \_(measurement method not constrained)\_
   8. Cross Wind Magnitude and Direction: any standardized measure at beginning of Test Series, Direction is direction of flow angled from North (approximate)\_(measurement method not constrained)\_
   9. Pressure Source Description: single line free field text\_
   10. Test Review Documentation: \_available / not available
   11. Companion Security Release Form: \_required / not required
   12. Test After Report: available / not available \_
   13. \*Test Setup Diagrams: diagram / image / Topological Map of Area / Lidar XYZ Scan of Area and format (jpg, bmp, pdf, etc)
   14. Document Name: single line free text\_
   15. Document Category: image / Test Report / Pre-Test Review
   16. Document Description: single line free text \_
   17. Tags: Home Made Explosive Conventional Explosive Metallized Explosive Interior Exterior Buried Explosive Air Burst 155mm Muzzle Shock 120mm Mortar Muzzle Shock 81mm Mortar Muzzle Shock 60mm Mortar Muzzle Shock 120mm Tank Muzzle Shock Shoulder Fired Rocket Air Shock Behind Armor Air Shock Near Field Medium Field Far Field Ground Shock Other\_\_\_\_\_\_
2. Test Shot (within Test Series)
   1. Individual Test Shot Number: serial number within Test series\_
   2. Test Shot Distribution Level: A,B,C,D,E,F \_
   3. Test Shot Designated FOUO Level: UNCLAS / FOUO / NOFORN / SECRET\_
   4. Date-Time: MM / DD / YYYY ; 24-hour \_ H \_ M \_
   5. Gauge #: serial number(s) \_
   6. \*Line of Sight Distance of Gauge to the Target: any standardized measure\_(measurement method not constrained)\_
   7. Pressure Data: Yes No
   8. Acceleration Data:Yes No
   9. Pressure Tabular input: Two columns, (time / Pressure)\_
   10. Acceleration Tabular input: Two columns, (time / Acceleration (G’s))\_
   11. Air Temperature: degrees Celsius measured at beginning of Test Shot\_(measurement method not constrained)\_
   12. Cross Wind Magnitude and Direction: any standardized measure at beginning of Test Series, Direction is direction of flow angled from North (approximate)\_(measurement method not constrained) \_
   13. Pressure Source: gun/explosive; \_ type; single line free field text \_ orientation: non-directional or direction of fire energy angled from North (approximate)\_(measurement method not constrained)

\_ charge weight \_single line free field text\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charge shape\_\_ single line free field text \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Target Description: single line free field text \_
  2. # of Gauges Per Shot: integer\_
  3. Pre and Post Shot Images: not available / available (and format)\_
  4. Shot Notes: multiple line free field text\_

1. Gauge Information
   1. Gauge Manufacturer/Model/Number: free field text\_
   2. Material/Personnel: type of subject, if any (free field text)\_
   3. Height Above Ground: any standardized measure\_(measurement method not constrained)\_\_
   4. Gauge Orientation Angled from North (approximate): angled from North (approximate)\_(measurement method not constrained) \_
   5. Gauge Orientation Angled from Horizontal (approximate): \_ angled from horizontal (approximate)\_(measurement method not constrained) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. Personnel Stance: free field text entry\_
   7. \*Location on Personnel: free field text entry \_
   8. \*Pressure Time History: Two columns, (time / Pressure)\_
   9. Pressure Sampling Rate: standardized pressure measurement vs time, free field text entry\_
   10. Acceleration Time History (G’s vs time): Two columns, (time / Acceleration (G’s))\_\_
   11. Acceleration Sampling Rate: standardized acceleration measurement vs time, free field text entry
2. Summary Data
   1. Per Shot Peak PSI: real number in PSI
   2. Per Shot Impulse: pounds per square inch times milliseconds, or psi-ms.
   3. Per Shot Duration (positive phase): time duration of overpressure greater than pre-shot baseline
   4. Per Shot Number of Peaks: integer, number of times during overpressure positive phase when pressure time history shows continuous increase across time
   5. Per Shot Use of multiple sensors? no / yes, integer for number of units
   6. Per Series Number of exposure events (shots): integer
3. Outcome Measures
   1. Source /type of information: free text entry
4. Other Information
   1. Helmet type: free text entry
   2. Other PPE: free text entry

For items labeled as ‘measurement not constrained’ the goal is to ease the burden of data transformation at data entry. Instead, the burden of transforming data to other scales (if warranted) would be accommodated by the storage host or by the user of any data.