Ground-based Nuclear Explosion Monitoring R&D

CE Mission

- SNL provides verification of the performance of seismic and infrasound monitoring station systems, sensors, and instrumentation. SNL also evaluates new sensors and technologies that could impact future monitoring deployments.
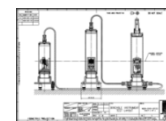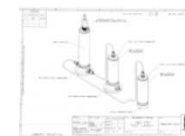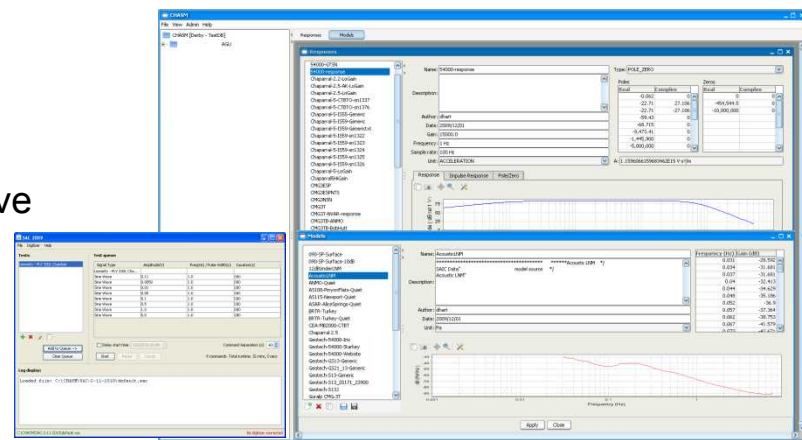
Work Accomplished

- Evaluated the performance of infrasound sensors
  - Inter Mountain Labs-SS 2007-7020
  - Chaparral 2.5 SAND2007-7064/SAND2008-5440
  - Intercon Tibbetts Infrasound System SAND2009-1552
  - Chaparral 25 2009-2126
  - Intricon Tibbetts Microphones 2009-3789
  - MB2005 SAND2009-4296
  - Miltec SAND2010-0702
  - PCB (from project NASA) - SAND2010-1071
  - Inter Mountain Labs-ST 2010-1569
  - Chaparral 50A SAND2010-6872

- Evaluated the performance of new digitizers
  - Geotech Smart24R SAND2008-3264
    - Seismic System Evaluation Report SAND2008-5446
  - Geotech Smart24BH SAND2009-6394

GNDD – Component Evaluation

Work in progress…

- CE Analysis software upgrade
  - TALENT – **T**est & **A**na**L**ysis **E**valuatio**N** **T**ool)
  - Standardization, with traceability and database archive of results
  - Models, Instrument Response, Procedures and Test Plan tools
  - Support Pinedale Seismic Research Facility (PSRF)
  - Infrasound testbed automation – SAC2011
- Sensor System R&D
  - Wind-Noise Reduction Systems
- Sensor Evaluation
  - NMT and NCPA
- CTBTO-IMS
  - Guralp digitizer - production
- R&D of sensor evaluation techniques
  - Three channel coherence using Guralp CMG3TB-VVV/HHH seismometer
  - Chaparral 50 - observations of non-linearity are confirmed by new analysis technique
- Calibration of test equipment
  - LANL Infrasound Test chamber – Traceability Test
  - Voltage, barometric pressure, temperature, displacement

GNDD – Component Evaluation

What's Next…

- Working with Guralp to develop best methodology for fielding the unique design of the CMG3TB bore-hole seismometer used to evaluate the Sleeman (2006) technique. This task will be continued though FY11.

- Continue working on TALENT software upgrade.

- Investigate the topic of infrasound calibration and address how to more fully incorporate error analysis into new software for infrasound testing. Work towards adding same error analysis to software for digitizer testing.

- Work with our sponsors on the station calibration issue. Equipment will be sent to Sandia for evaluation and possible field deployment.

- Support other sensor development efforts by providing evaluation assistance at FACT site.