

NSF 00-6

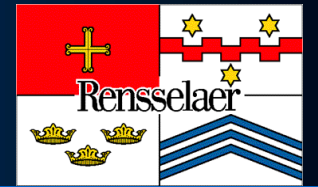


**Upgrading, Development and Integration of Next Generation Earthquake
Engineering Experimental Capability at Rensselaer's 100 g-ton Geotechnical
Centrifuge**



Submitted by:
Ricardo Dobry
Tarek Abdoun
Ahmed Elgamal
Mourad Zeghal
Thomas Zimmie

RPI NEES SITE

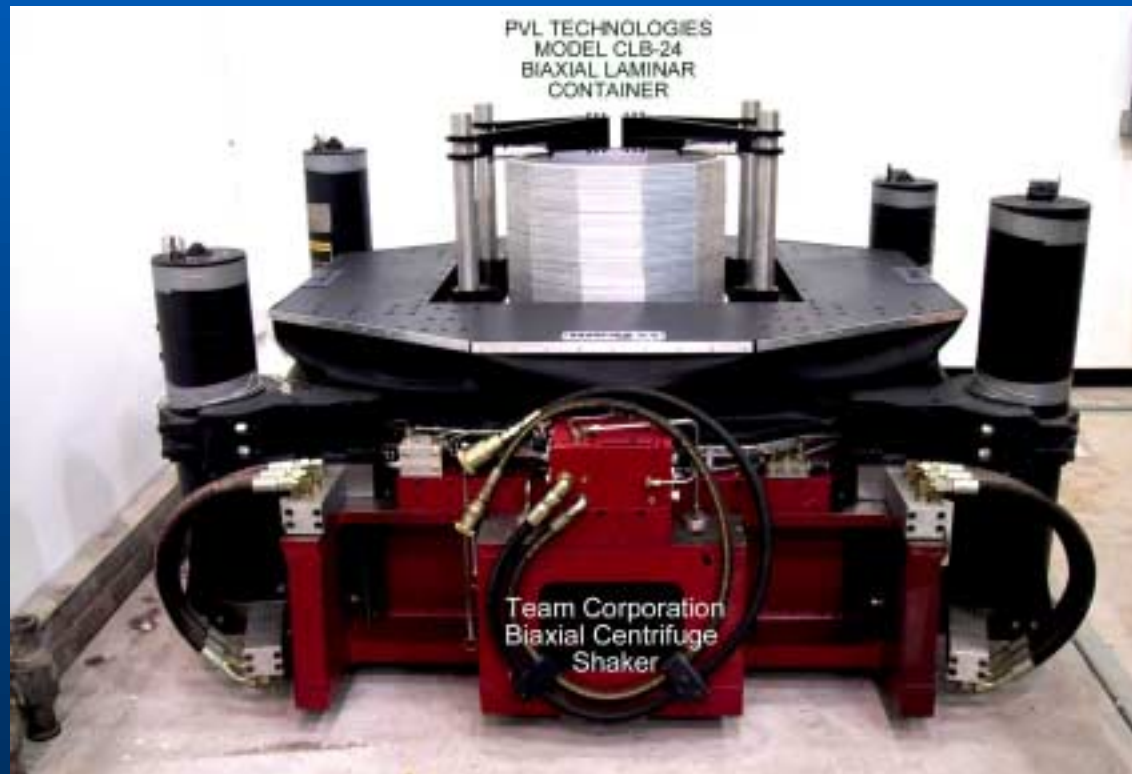


- **2D Shaker & 2D Laminar Box**
- **4-D In-flight Robot**
- **Web-Based Data Acquisition**
- **Advanced Sensing**
- **Other Aspects**
 - **Data Management**
 - **Tele-observation & Tele-operation**
 - **Visualization & System Identification**

RPI NEEDS SITE



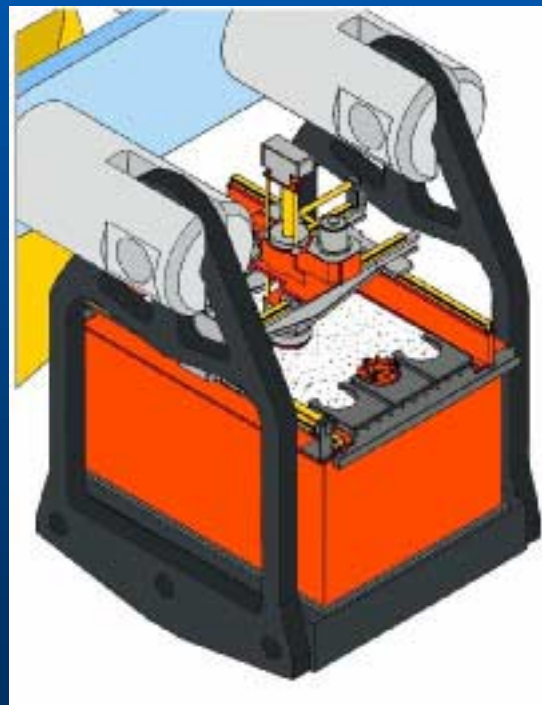
- 2D Shaker & 2D Laminar Box



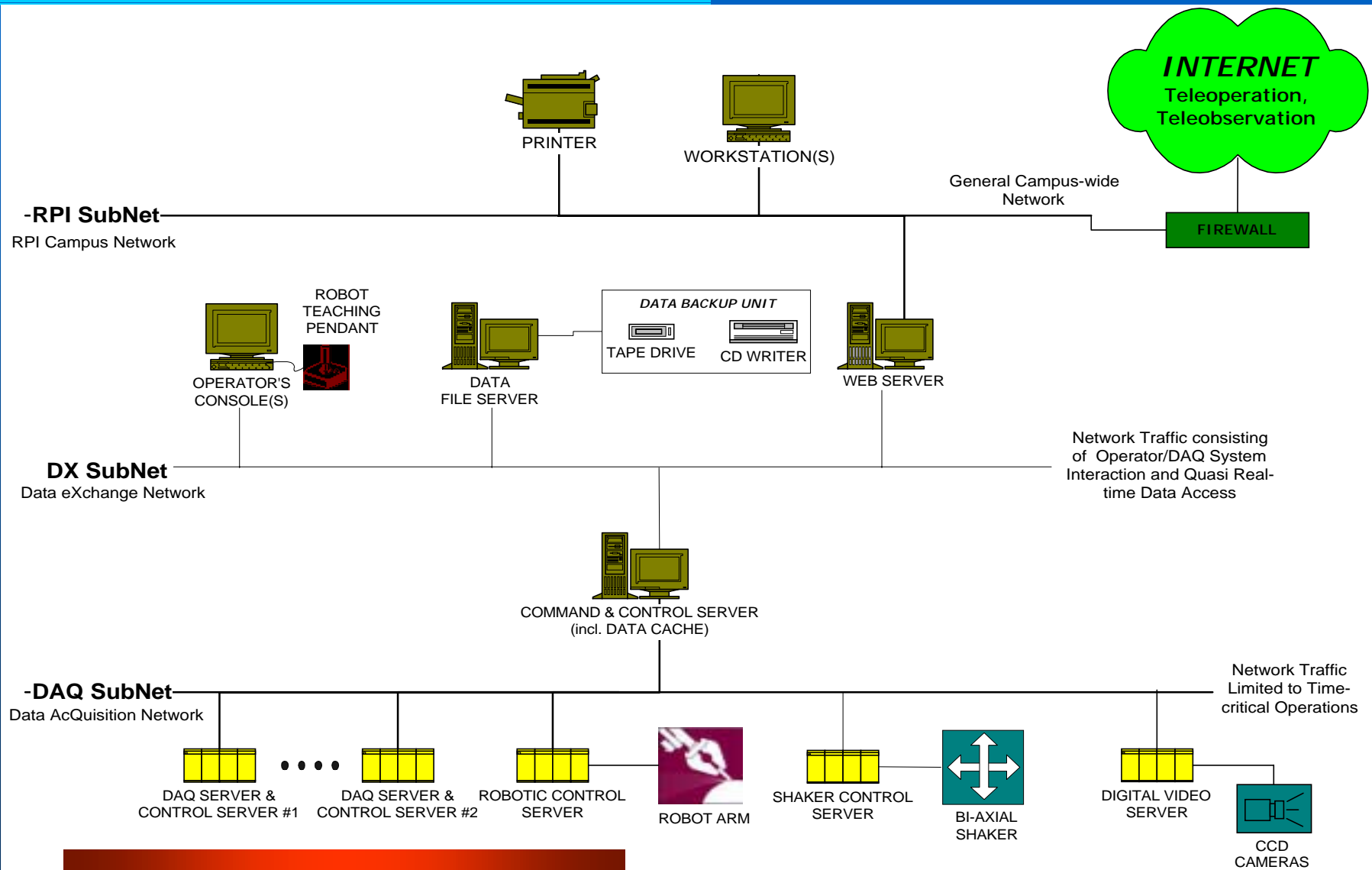
RPI NEEDS SITE



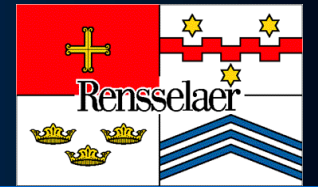
- 2D Shaker & 2D Laminar Box
- 4-D In-flight Robot



Web-based Data Acquisition



Data Management



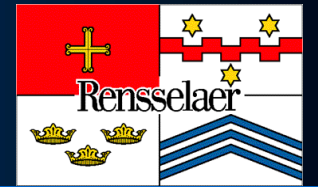
- Individual test data recorded in Data Base with relevant test information
- Timely release of Data Base after review
- NEES Electronic Journal: articles of interpreted series of centrifuge tests with complete Data Base (peer review of both article and Data Base)

Tele-observation



- Interactive teleconferencing
- Install web & video cameras in centrifuge & model preparation rooms
- Monitor measured data in real time
- Pilot project with UCSD
- Visualization of measured data
- System Identification techniques to evaluate model response

Tele-operation



- Secure & reliable connection
- Limited by safety concerns
- Feasible applications:
 - in-flight robot operation
 - sending shaker triggering signal
- Broader definition of tele-operation

Advanced Sensing



- High speed cameras
- Advanced sensors
 - Wireless sensors
 - MEMS sensors
 - Buried targets
 - Fiber-optic sensors

