

Response to Question 6 – Statement of Research Project

The IRIS/PASSCAL Instrument Center (PIC) is located at 100 East Road, Socorro, NM 87801, on the New Mexico Institute of Mining and Technology (NMT) campus.

The facility is funded by the National Science Foundation (NSF) through the Incorporated Research Institutions for Seismology (IRIS), a consortium of over 100 US Universities. It has a staff of 30. PASSCAL purchases, maintains and ships to the field or otherwise houses seismic recording equipment for experiments throughout the world. These experiments are mostly organized by US universities and funded by NSF.

IRIS requests the use of a GPS re-radiating system inside the PASSCAL Instrument Center (PIC) to permit it to utilize its existing GPS equipment for its seismology testing. The GPS re-radiating system for which IRIS seeks an experimental license is for indoor use only. The GPS re-radiating system IRIS proposes to use is not experimental. It is manufactured by GPS Source, Inc., a company specializing in this type of equipment.

The GPS re-radiating units consist of an active roof antenna, a re-radiating amplifier, and a passive re-radiating antenna. The GPS L1 signal from the roof antenna is amplified and radiated indoors. The indoor passive re-radiating antenna operates at 1.575 GHz and a power of 3 dBic. The units will operate with a –20dB attenuator. The GPS re-radiating system involves the mounting of the active roof antenna on top of the PIC facility. A coaxial cable attached to the roof antenna will transport the GPS L1 signals from the roof antenna to a re-radiating amplifier with a wall mount plug-in transformer that powers the entire system. The amplifier, which will be located inside the PIC facility will re-radiate the signal inside the facility. A passive re-radiating antenna inside the PIC facility will receive the re-radiated signal and can transmit the GPS signal up to 100 feet away. Additional technical information regarding this system is attached as Exhibit 3.

The GPS re-radiating system is necessary for IRIS' indoor testing of its seismic equipment. Seismic equipment is often installed in very remote and environmentally hostile regions. Seismic recording systems each consist of a sensor that is sensitive to ground motion, a digital recording device, associated power supplies, and GPS in order to provide accurate timing of the data. Deployments can last a little as a few days, up to several years, and can consist of up to several hundred recording systems for a single experiment.

Before and after each deployment, the equipment is set up in the PASSCAL facility and subject to a series of quality-control tests. Timing is a critical component for both testing and routine operations of the systems, with an accuracy to within several msec required. With sometimes several hundred systems undergoing tests at a time, it is not feasible to establish a GPS farm. GPS re-transmitters are necessary for these indoor tests.

The PASSCAL Instrument Center is located 3.44 miles north of the Socorro Municipal Airport (FAA Identifier KONM). This airport is unattended, located in non-towered Class G airspace and has one GPS-based instrument approach. It is not served by FAR Part 121 carriers. The location of the facility relative to the airport is shown in the attached map.

Although the facility appears on the same bearing as runway 15/33, the GPS instrument approach begins south of the airport and routes missed-approach traffic east and north of our facility. (FYI – air traffic can and do approach the airport from any direction, however those flying the instrument approach would only descend to low altitudes (500-3000' AGL) from south)

Other nearby airports with instrument procedures are Alexander Municipal Airport (E80, 38 nautical miles to the north) and Truth or Consequences Municipal Airport (KTCS, 51 nautical miles to the south). Albuquerque International Airport (KABQ) is 63 nautical miles to the north.



