VLBA CC Memo No. 37

NATIONAL RADIO ASTRONOMY OBSERVATORY

Charlottesville, Virginia

1984 December 5

To: Coordinating Committee

From: P. B. Sebring

Subject: Station Emergency and Standby Power

Refs: CC Memos #34 and #36.
Electronics Memo #28

We have been trying to hold down building and support costs at the VLBA stations, partly in the hope of augmenting the funding for the AOC building. I suggest that the arrangements for uninterruptible and standby power may be a poor choice for budget trimming.

Many, if not most, of the proposed sites are in remote areas, where the station power will be supplied over a long "extension cord" and will be subject to instabilities and interruptions due to lightning and other causes. Depending upon the power philosophy we adopt, this could have very little effect on operations or could result in much inconvenience and lost observing time.

At GRAS (Fort Davis) in late 1981, we adopted the approach that the computer, and all receiving and data recording equipment would be on an uninterruptible supply (UPS), while the entire Station load would be picked up automatically by a generator if utility power failed for more than 30 seconds. When an outage occurred, tape continued to spin and nothing in the receiving/recording chain was affected. Thirty seconds later, the LP-gas-driven generator came on, all cryo and other support systems came up and the antenna caught up with the source. The operator simply sat and watched. As much as any change made between 1980 and the present, this arrangement helped convert GRAS from one of the less to one of the more reliable members of the present US VLBI Network.

The cost for GRAS was a 5 kW Sola UPS at about $11,500 complete with 1-hour battery, plus an Onan 75 kVA 120/208 V engine-generator set with automatic changeover panel, which we promoted from another Harvard activity. A 500 gal. tank of LP gas fuel was provided, sufficient to run the Station for a few days.

MIT Lincoln Laboratory has bought some six Onan units this past year with automatic changeover panels for standby service, in sizes 25-100 kVA. Actual costs were about $220 per kVA, *vs* the $400 figure we've been working with. While Lincoln bought diesel units, I would suggest we consider LP gas fired units

because of the ease of starting in cold weather without the need for fuel heaters and other diesel starting aids.

We plan to provide each station with a UPS and a standby generator in any event. In each case, the unit will doubtless be a fair fraction of the size that would be required to adopt the GRAS philosophy. I recommend that, as soon as the numbers on station power requirements are in, we evaluate carefully the incremental cost of providing adequately sized units to support that approach. I should point out that the peak demand will be occasioned by a fast-slew command to both axes of the antenna. If we arrange to limit the slew speed during operation on standby power, the size of the generator can be correspondingly reduced.

My guess is that the extra cost per station would be less than $20,000. And a whole class of problems goes away.

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