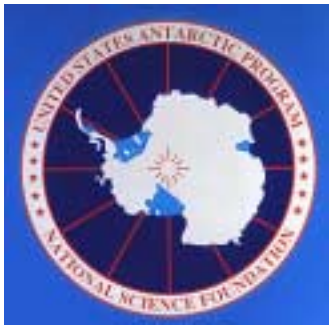

National Science Foundation

South Pole Station

Satellite Communications Study

October 4, 1999

Draft Review Copy

Executive Summary

This study is the final study in the series developing information leading to specific communications solutions for the South Pole Station (SPS). (The reader should recall that normal Geo satellites are not visible from the SPS). A solution means providing high bandwidth connectivity to the SPS for the maximum period of time, and low bandwidth service full time. The focus of this study is on satellite solutions and recommendations derived from previous studies investigating the field of available satellites. In this study we conclude that very few usable satellites exist to serve the SPS wideband needs and that satellites can become available randomly, as a result of lease terminations, launch failures, or other uncontrolled events. Furthermore, after identifying a candidate satellite considerable effort is required to evaluate its potential suitability. Also in order to make use of random satellite opportunities planning must be completed to ready the infrastructure needed to support any satellite solution. Some of these opportunities are very time sensitive. It may not be feasible to react and capitalize on acceptable satellite solutions, without previous infrastructure planning. The infrastructure must be ready when the satellite is. Infrastructure means the tails circuits and any ground support needed to construct the entire circuit, not just the satellite availability.

To adapt to the time sensitive situations we are recommending that a generic ground station be readied. This generic ground station can be rapidly configured to work with a variety of satellites (e.g. Maritime, Domsats, Intelsat, NASA, NOAA, and European satellites). This is not an expensive issue. Having a generic ground station at the SPS will enable the NSF to press into services satellite opportunities that develop, including both planned and unplanned.

Finally, in this report we discuss two near term commercial satellite solutions developed during the study. These solutions enable T1 (and higher) service for the SPS. We are providing herein, pricing, and other details associated with these real commercial solutions. In summary, one solution for a T1 will cost about $6 million for a ten-year service life, while the second solution for many T3's will cost in excess of $25 million for the 10-year service life. (Costs are satellite costs)

We also reviewed the “supportability” issues to provide a complete picture of the project needs keyed with our recommendations. Moreover, a schedule is provided utilizing the Marisat Satellite solution and it shows that all hardware must be procured, built, tested and shipped to the California logistic center by Mid August of 2000 to make the 2001 SPS implementation schedule. This means there are 8 months to complete all CONUS work on any hardware bound for the SPS -if the clock starts in January 2000. Schedule details are found in this report.

In addition we identified risks and risk mitigation strategies along with recommendations and conclusions.

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