

**Project Report**  
**Alaska Public Broadcasting, Inc.**  
**Project Number 0117-DC-2004-15**  
**July 1, 2006 – September, 30, 2006**

**Alaska Rural Communications Service & Satellite Interconnection Revitalization**

*Project Summary:* the ARCS revitalization project continues to make measurable progress. The project objective is the restoration of television broadcast programming to bush and rural communities by either repairing or replacing non operational equipment. This includes transmitters, antennas, satellite dishes, receiver/decoders, or towers. Accomplishments to date include:

*Restoration of service:* reliable ARCS service has been restored to more than 100 bush and rural communities where it had been completely off or seriously degraded.

*Acquisition and refurbishment of equipment:* refurbishing original transmitters saves approximately \$5000 per unit compared to purchase of new systems. We continue to cycle rebuilt units to the villages and bring the failed units back from those communities and send them off to the factory for rebuilding. We have rights to use some new receivers to decrease our response time when existing units fail in the villages.

*Provision of timely customer support:* with a system that includes more than 200 sites, technical staff is kept busy each day with myriad general service and trouble calls involving unique factors and circumstances to analyze and address. The range of work can run from a simple reset to a complex set of problems which have resulted in the complete failure of a village's local service.

*Establishment of community partnerships:* the majority of the service restoration work is attained through partnership, technical staff working with dedicated community volunteers. Some sites and projects require staff travel in order to deal with the extraordinary circumstances.

*Progress on phases two and three:* design and implementation of modern delivery and control systems. The goal is to develop a consolidated delivery system and central point of control for multiple content streams. A new method of controlling the ARCS program schedule is operational, allowing for remote operation. Equipment purchase and installation of a new State of Alaska satellite uplink system is complete.

The overall project is on schedule and within budget. We have not encountered any serious unanticipated problems or set backs requiring significant changes to the work scope. Restoration or upgrading of service presents a different challenge in each community. In partnership with our community liaisons, we continue to identify and solve these problems.

**Activity detail: July 1, 2006 – September 30, 2006**

- Handled more than 250 calls for assistance from 72 different bush and rural communities serviced by ARCS.

- Restored service to 16 communities by means of either equipment replacement or troubleshooting existing equipment; sent three rebuilt transmitters out into the field to replace failing units, and two new transmitter systems to replace obsolete stations. The aging fleet of satellite receivers that was put into service in 1996 continues to show signs of age with another five needing replacement. These units have reached the end of their service life and are no longer repaired by the manufacturer, so in the future they will be replaced with new ones. Fortunately the new units are about half the price of the originals.
- Restored service to the Trapper Creek station with the installation of a new 100 watt UHF transmitter system. The signal from this site reaches a relatively large population spread out along several miles of the Parks highway, across the rivers to Talkeetna, and down the spur road towards the community of “Y”. In addition to the transmitter system, new power conditioning and satellite reception equipment were installed. Final installation of another new 100 watt UHF system is being completed by the community volunteer in Craig, where ARCS has been off for a long time.
- In July, delays started to occur in both new orders and repairs to the modulators used in transmitter rebuilds. As the summer progressed, we asked our transmitter company to change modulator vendors, hoping for a speedy resolution. As it turned out the new vendor could not engage immediately. As such we were slowed in our attempts to process half a dozen transmitter orders and another dozen modulator orders. Eventually the logjam was cleared and we received everything back at once, so we are now working to process those units out to the backlog of locations waiting for service to resume.
- In August we moved the ARCS satellite uplink to a new frequency and in the process successfully instructed the fleet of installed receivers around the state to tune to the new frequency as well. The change is part of the carrier consolidation project. Following the move we fielded calls from about fifteen users, mostly cable companies, needing help manually tuning to the new frequency; this was expected. The move was good for ARCS as it put our carrier on a frequency where there were no nearby competing signals.

It was too good to last though and in September we began to get calls from several communities reporting ARCS outages. After investigating with our own dish and test equipment we discovered that some new carriers had been illuminated on an adjacent satellite. These new carriers have not been publicly announced so their origin is unknown, but they are quite large. The result is that if one of our satellite dishes is out of alignment it will see the undesirable carrier over the top of our own. We have since been instructing affected users to align their dishes; those who are capable of such work have reported good results.

Some locations will need to be visited by a technician with the appropriate tools to get the dishes back on point. Completion of the consolidation project will make ARCS part of a larger carrier and thereby less susceptible to this kind of interference.

## **Alaska Public Broadcasting Digital Distribution Network**

*Project Summary:* project objective is interconnection of public broadcasting system facilities by means of the internet or constructed intranet. Upon completion of the network, delivery of content - programming, data and voice - and access to advanced networking options will be available to the system, enhancing service to local, regional and statewide audiences.

The project is based on a network design developed under a previous federal grant from the US Department of Commerce. The project began in March 2004 and accomplishments to date include:

*Review of network design and work scope:* a thorough review of the original design and work scope was completed to determine if the selected equipment was still the best choice.

*University of Alaska partnership agreement:* entered into a multi year agreement with the UA statewide office of information technology for provision of connectivity between the hubs via the UA data backbone; and operational oversight of the network on a twenty-four hour basis once normalized operation begins. This oversight provides rapid reporting of problems so system maintenance and repair can be provided with minimal down time for network users.

*State of Alaska partnership agreement:* additional connectivity for the system will be made available to the network by the State of Alaska's Enterprise Technology Services division. This circuit will provide additional capacity between Juneau and Anchorage.

*Equipment bids, purchase and deployment:* the core equipment for the hub and control locations was installed in August 2005. Since then, data network equipment for 20 out of 26 stations has been installed and is operational. Competitive bidding has yielded average discount of 31% saving \$465,000.

The overall project is more or less on schedule and within budget. There continues to be minor deployment delays and local technical issues to resolve but we have made good progress and we have not encountered any serious unanticipated problems or set backs requiring significant changes to the work scope.

### **Activity detail: July 1, 2006 – September 30, 2006**

The deployment phase of the data network project is nearing completion with new network interconnection equipment installed and operational at twenty-two stations. The new equipment is designed to take advantage of high speed connectivity when and where available and to expand the capacity of a stations local network. Securing sources of cheap high speed connectivity to improve the stations access to product and the internet remains a top priority.

### **Highlights:**

- Provided continuing O&M technical assistance to staff at KUAC, KAKM and KTOO, CoastAlaska stations and other installed sites
- Installed KSDP (Sand Point)

- Installed KNSA (Unalakleet)
- Installed KYUK (Bethel)
- Provided specialized assistance to KBBI (Homer) on redesign of their local data networking systems (integration of new racking system, battery-powered UPS, etc.)
- Provided ongoing TCP/IP network design/operations guidance to APBI staff in support of statewide and site specific operations (e.g. EAS over TCP/IP development, custom interface development for IP-encapsulated video streaming, etc.)
- Assisted in development of new IP-encapsulated video pathway between KAKM (Anchorage) and KUAC (Fairbanks) for on-demand carriage of programming content
- Continued investigation of VSAT IP delivery technologies working with a Houston-based firm on Hughes Network Systems setup

### **Summary:**

Third Quarter 2006 APBI ADDN project work focused on completion of rollout and turn up of ADDN equipment in rural public broadcasting sites. Sand Point, Unalakleet and Bethel sites were completed during third quarter. Some logistical delays related to managerial changes and/or site modifications already in progress were encountered, pushing rollout to Fort Yukon, McGrath, St. Paul and Chevak into fourth quarter 2006.

Third quarter also saw the development and rollout of several new MPEG-2 video over IP systems (KTOO-KUAC, KAKM-KUAC) into production.

One very significant aspect of the quarter's activity comes in the form of discovery of a viable VSAT service provider for the State of Alaska using standard Hughes Network Systems Ku-band IP networking equipment. This system is currently being analyzed/evaluated for its potential effectiveness as a cost-feasible solution for broadband IP internetworking of all ADDN sites.

Efforts continue to focus on operationalizing the network, and as the rural installation work comes to a close, the O&M process development will form the bulk of the remaining work on this project.