SINCE 1948
RACO®
REMOTE ALARMS AND CONTROLS

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MINE FALLS HYDRO ELECTRIC APPLICATION ARTICLE

Most of us have seen the television commercial with Victor Kiam saying he liked the electric razor product he is promoting so much that he bought the company. Since RACO is not for sale, Energy Resources Group, Inc. of Portsmouth, New Hampshire, did the next best thing. They decided to represent RACO's line of autodialers in the New England area.

Energy Resources Group, Inc. initially got involved with RACO and CHATTERBOX® out of a need to have an inexpensive and reliable monitor for small hydro electric generating stations. After the purchase and successful installation of several units it became apparent to them that the product solved the monitoring problem that many small hydro owners faced. They have now represented RACO for four years in the New England area, and have been in the top five sales rep agencies over the entire four year period.

Energy Resources Group is very active in the mechanical operation and maintenance services of hydro electric sites, and, in fact, have service contracts with hydro owners and rely on CHATTERBOXES to monitor the well-being of the plants to alert them to problems. One such site is Mine Falls Hydro in Nashua, NH. It is a 3 MW hydro station using two Allis Chalmers single regulated Kaplan turbines, each rated at 1,750 KW. The site is a continuously running, fully automatic plant located on the Nashua River. The mechanical installation was, in large part, handled by current members of Energy Resources Group, Inc.

The station is equipped with two CB-8's (pre input expansion model vintage) which are programmed to monitor on/off status of both turbines, emergency trip on/off status, ambient air temperature in the water cooling section of the building (heaters warm building air during winter months to prevent cooling water freeze-up), sump water level, pond water level, and site intrusion.

When an alarm condition occurs, the CHATTERBOXES call Energy Resources Group, Inc. during normal working hours and service personnel are immediately dispatched to the site. As the service contract calls for response within 1.5 hours, and the site is 1 hour and 15 minutes from the shop, false alarms simply cannot be tolerated. During off-hours, there is a local serviceman on-call for nights and weekends, 365 days per year. He is backed up by several employees with pagers.

Service personnel routinely call the CHATTERBOX to check station status. As it is a fully automatic system, in that the turbines routinely turn on and off depending upon water flow conditions, it is not necessarily an alarm if the turbines go off line. An emergency shutdown is signaled by the opening of the emergency trip(s). Therefore, personnel can distinguish between normal and emergency shutdowns.

Last fall the packing box on one of the turbines developed a leak, causing the power house to begin to flood. The alarm call from the CHATTERBOX came in at 3:00 am and said "BLLBLB". The on-call mechanic responded immediately and found the tide rising rapidly. A quick inspection found the leak, and also that the sump pump was attempting to eat a rag, which seriously inhibited its water pumping ability. Within 30

minutes he had removed the rag and made temporary repairs to the packing, thereby averting a major flood in the plant. Had water risen to the point that it reached the main switchgear while the plant was "live", major damage in the $250,000 range would have resulted and the plant could have easily been out of service for as long as 6 months for repairs. The lost revenue for such a period could conservatively have reached $500,000.

Energy Resources Group is in the process of installing analog boards to the units so that power output can be determined remotely. High water in the pond should correlate to high KW production. If it doesn't, there are probably obstructions to normal water flow and personnel will be dispatched to the site to clean away any debris. Future additions planned include remote supervisory control to permit emergency spill gates to be opened when water levels are dangerously high, and to remotely activate the automatic trash rack rake when large collections of debris are suspected.