A New Meteorological Data Acquisition System at the Savannah River Site

By

Matthew J. Parker
Atmospheric Technologies Group
Savannah River Technology Center
Westinghouse Savannah River Company
Aiken, South Carolina

The Atmospheric Technologies Group (ATG) of the Savannah River Technology Center (SRTC) developed and presently operates a network of meteorological observation towers (Parker and Addis, 1993) that provide timely, accurate real-time meteorological data for a variety of uses including emergency response to unplanned atmospheric releases and near-term weather forecasts. The data from this system are permanently archived and subsequently used in studies that require climatological databases or specific periods of data. Optimizing data availability and maximizing operating efficiency are primary goals for continually improving the ATG meteorological monitoring system.

Recently, several factors led to the decision to revamp the entire data acquisition system. The components used since the last upgrade had become obsolete or costly to repair and maintain. Planned expansion of the tower network to include offsite locations necessitated a modular design to allow separate towers to come online individually. Since phone line outages were the primary cause of data outages, a system that "back-filled" data for periods when phone line outages occurred was determined to be desirable. Data sampling, statistical manipulations, and short-term storage conducted at the tower location rather than on a central computer also became desirable to distribute computing resources effectively. Also, data dissemination beyond the central computer became necessary since atmospheric modeling and data display software had been ported to a personal computer platform that can be operated on or off-site.

To meet the multiple objectives cited above, ATG decided on a data logger based system that utilizes a remote polling function to retrieve data from individual monitoring sites. Polling is conducted over dedicated phone circuits or modems every 15 minutes, and data becomes available to the user minutes thereafter. Off-site locations can receive the previous 12 hours of data via the Internet. Data are permanently stored in a relational database that can be accessed through a graphical user interface or directly by emergency response models. Data logger channel configurations are created and stored remotely to allow quick installation of new or replacement loggers by performing downloads over phone lines.

Reference:

Parker, M. J. and R. P. Addis, 1993: Meteorological Monitoring Program at the Savannah River Site (U) (WSRC-TR-93-0106). Westinghouse Savannah River Company, Savannah River Technology Center, Aiken, SC 29808.