

THE ONCE AND FUTURE UTILITY: BALTIMORE GAS & ELECTRIC

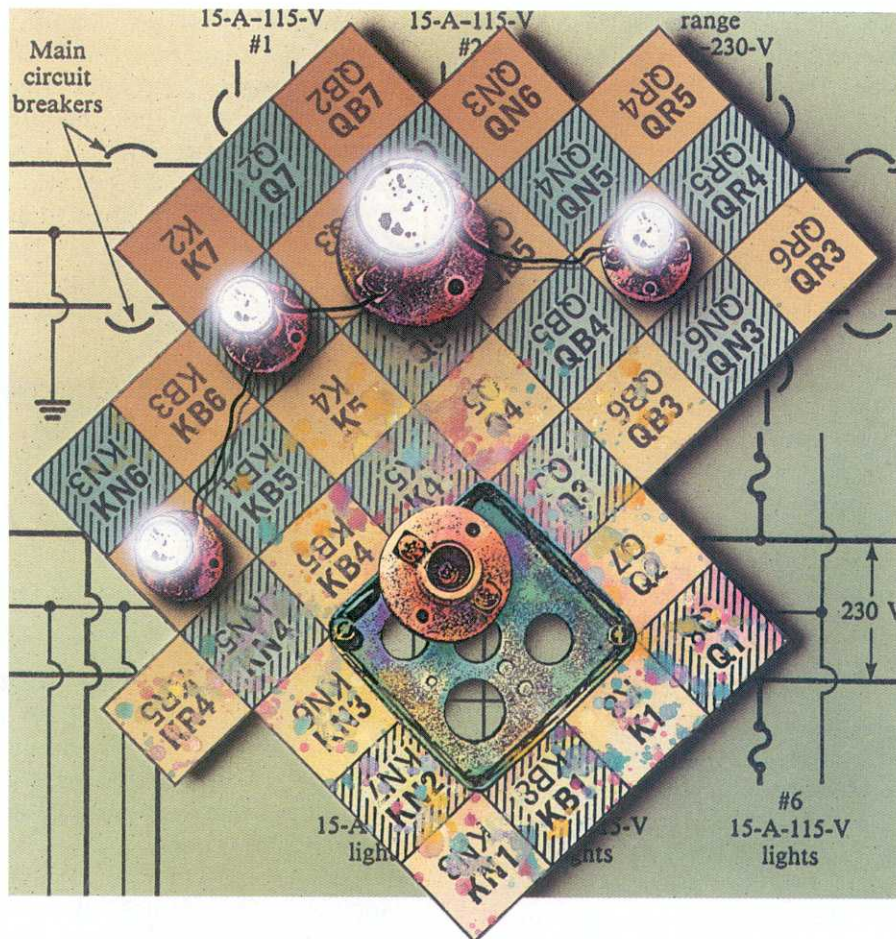
Prepares for a Competitive Future

THE ELECTRIC-UTILITIES industry in the U.S. is about to experience the same kind of deregulation that has swept through the airline and telecommunications industries with often tumultuous results. Today, most electric-utility companies are regional monopolies. Protected by law from competition, they are the sole providers of electricity to consumers in their service areas. But many believe these companies are about to lose the protected status of a monopoly and, in a few years, will have to compete for customers, just like any other business—on the basis of cost, quality, and service.

California, for example, has already mandated that its regional electric-utility companies open their power grids to other suppliers by the year 2000. This "open access" policy will mean that virtually anyone with a power generator will be able to sell electricity to any customer, anywhere in the state, and the state's existing electric-utility companies will have to carry that electricity through their power lines to the customer premises. As the most populous state in the U.S., California has influence nationwide.

Across the country, on the shores of the Chesapeake Bay, Baltimore Gas & Electric (BGE) is taking California's open-access policy as a harbinger of changes to come nationwide, says Joe Hunter, the Maryland-based company's manager of information systems. "At some point in the future, people will be able to buy their energy from any utility," he says. "They won't be in the position where they can buy their energy only from a utility that is in their service territory."

In such an open competitive environment, customers will naturally look



to the lowest-cost provider, whether it's their local utility company or not, says Hunter. In anticipation of that day, BGE has set out to become a low-cost power provider. A key part of that effort is NUCLEIS, an automated plant-maintenance and records-management system that today runs on top of an Oracle7 database.

SAFE NUCLEAR POWER

BGE's 10 plants provide power to more than one million customers in the city of Baltimore and all or part of nine counties in surrounding central Maryland. To meet customer power demand, the company relies heavily on its Calvert Cliffs Nuclear Power

Plant. Of the company's peak capacity of 5,400 to 5,600 megawatts, 1,600 megawatts—or almost 30 percent of BGE's capacity—come from Calvert Cliffs.

Proper maintenance is critical both to maintaining plant safety and to keeping the plant operating at maximum efficiency. NUCLEIS is a mission-critical application not only because it is essential to plant safety—always of highest concern at nuclear-power plants—but because it keeps Calvert Cliffs' two power-generating units operating at peak efficiency for the maximum amount of time possible. Although new nuclear-power plants tend to be more costly

to construct today, the Calvert Cliffs plant provides BGE's cheapest power, says Hunter. That's because it was built in the early 1970s, when construction costs were much lower than today. Keeping Calvert Cliffs online, generating electricity, is essential to keeping BGE's overall cost of providing power to its customers low.

"The plant is constantly looking at how it can reduce maintenance expenses, because that's a major expense portion of the cost to produce the power," says Hunter. "NUCLEIS allows Calvert Cliffs to more effectively manage that expense."

JOINT EFFORT

Five years ago, BGE set out on a search for an automated plant-maintenance and -management system. The Calvert Cliffs plant had outgrown the capabilities of its existing mainframe system, which the company had developed in-house.

Like many users, BGE preferred to buy a packaged solution rather than roll out its own. After an extensive search, it settled on the Nuclear Information System (NUCLEIS), from Southern Development and Investment Group (SDIG), in Atlanta, Georgia. At first, BGE installed NUCLEIS on a dedicated Amdahl IBM-compatible system at the Calvert Cliffs plant. That proved to be little more than an interim solution.

According to senior project administrator Larry Brown, "the IDMS-based NUCLEIS system became an excessively expensive operation to run on a dedicated mainframe." The IDMS technology was old, Brown explains, and even though BGE had made updates to the system, performance remained poor.

More important, says Hunter, the old application was a potential drag on BGE's competitiveness. IDMS, he says, didn't provide a flexible programming environment that BGE could easily change to meet the rapidly changing competitive and regulatory environment.

With the company's monopoly status in question, Hunter says he felt BGE needed a new system that was flexible enough to adapt to changing

regulations and competition. BGE had a corporate mandate to use IBM's DB2 on the mainframe and Oracle Server wherever else it was possible. With that in mind, Hunter hit on the idea of approaching Oracle Corporation and SDIG with a proposal: He suggested that the three companies work together to develop an updated version of NUCLEIS that would run in a distributed computing architecture on the Oracle RDBMS. Such an automated plant-management system, Hunter believed, would be less costly to run and would provide BGE with maximum efficiency and flexibility.

The trio agreed, and BGE dispatched two nuclear-function representatives and two systems analysts to help Oracle and SDIG develop a new version of NUCLEIS that would run in an open-systems environment. The team developed the new version to run on top of the Oracle database and developed 80 percent of the code using Oracle's CASE tools (now bundled as Designer/2000). (Oracle, in fact, has taken on the product as its own and intends to market it as Oracle Plant Manager.)

THE NEW NUCLEIS ONLINE

NUCLEIS went online at Calvert Cliffs Nuclear Power Plant in November 1994. The new system runs on a three-tier distributed computing environment consisting of a Digital Equipment Corporation Alpha 7000 OSF/1 application server, a Hewlett-Packard 9000 four-CPU T500 SMP database server, and desktop IBM-compatible 386 and 486 PCs running Microsoft Windows as clients.

NUCLEIS provides document and records management, equipment tracking, maintenance management, and activity and materials tracking. Users enter work orders, which the system tracks through to completion. According to BGE, NUCLEIS has quickly become essential to plant operations. Plant workers now initiate all work orders in the system, which tracks them to completion and even historical archives.

Most work done at the plant requires approved procedures, drawings, and other documentation. By

checking in the system, plant workers can easily verify that they are using the proper revisions of this documentation. Once users identify a particular piece of equipment to the system, NUCLEIS makes all supporting information readily available.

NUCLEIS records approvals and completion orders, and it reviews work orders and procedures according to preset parameters. In this way, BGE ensures that it maintains the plant in conformance with guidelines set by the Nuclear Regulatory Commission (NRC), a federal body that oversees all nuclear-power-plant operations in the U.S.

The NRC also requires that all nuclear-power plants maintain extensive documentation of their operations. To ease the paperwork and records-keeping, NUCLEIS includes a second component, NORMS, a records-management and -indexing system. BGE's plant engineers use the search and indexing capabilities of NORMS to identify and locate work orders and other documents related to Calvert Cliffs' operations.

NORMS connects directly to an online imaging system from FileNet, in Costa Mesa, California, thereby allowing users to gain immediate access to documentation.

PREPARED FOR THE FUTURE

BGE's Hunter says it's too soon to say how much cost savings over current plant-maintenance expenses NUCLEIS will realize. BGE *has* cut \$500,000 in annual mainframe software licenses and hardware maintenance since it moved NUCLEIS off its own mainframe, however. Cost savings are important, Hunter says, but the most important thing is that NUCLEIS prepares BGE for a competitive future.

NUCLEIS helps BGE adapt easily to shifting currents in the electric-power-supply industry, something that would not have been possible with the old system. Hunter concludes, "Oracle gives us the capability in our systems to respond more readily to competitive changes."

(For information about Oracle Plant Manager [NUCLEIS], call Oracle Corporation.) ☐