PRO-ACTIVE vs. RE-ACTIVE

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As with other aspects of business, there are people and companies that operate in the pro-active mode and those that act in the re-active mode. The pro-active group are constantly looking for ways to improve the processes, are striving to anticipate the market directions, and to no one's surprise, are usually the most profitable and successful companies. Contrary, the re-active groups try to fix problems after they occur, or design a new product to match what the competition has just announced, and find that they are always playing "catch-up" in the market place with narrow profit margins. Continuing the analogy to the fire service from last month's article, it is like fire prevention versus fire fighting. The primary purpose of a fire department is to prevent fires, not extinguish them. The same scenario should be true in power quality monitoring.

The uses for power quality monitors can be grouped into three general categories:

1. Diagnostic/Evaluative
2. Characterization and Statistical Indices
3. Predictive

The diagnostic usage is also known as the troubleshooting mode. This is typically how portable power quality monitors have been employed in the past. Something has failed and the process is interrupted, so what caused it? Many people begin in this mode, as it can be initially difficult to justify the expense of a power quality monitor to those who control the check books. Such a post-event type monitoring can often be a difficult, forensic-like task, as the series of events that lead up to the failure may be random and occur infrequently (such as lightning), or may be the result of a random coincidence of a series of conditions.

The characterization and statistical indices for power quality provide a basis for the user to determine what is “normal”. Since the effects of the environment and load patterns may differ significantly over the course of a year, permanently installed power quality monitors are usually used to collect this data. This type of usage often requires the collection and post-processing of large quantities of data, and the associated data management and statistical algorithm complexities. The EPRI DPQ project collected over 40 gigabytes of data in the two year survey of three points on 100 distribution feeders throughout the United States.

The next step is to use power quality monitors as predictive tools, to not only record "what has been", but to try to determine "what will be". This is the pro-active approach that can result in very substantial cost savings or “prevented” costs. This is usually carried out with the installation of permanent monitors at the point-of-common-coupling, various distribution points throughout the facility and at the critical loads, all reporting their data to a central computer for processing into information. Companies with very limited capital budgets have used a portable monitor that is normally installed at a fixed point, but can be temporarily removed to perform troubleshooting at another location in the facility when the need arrives.

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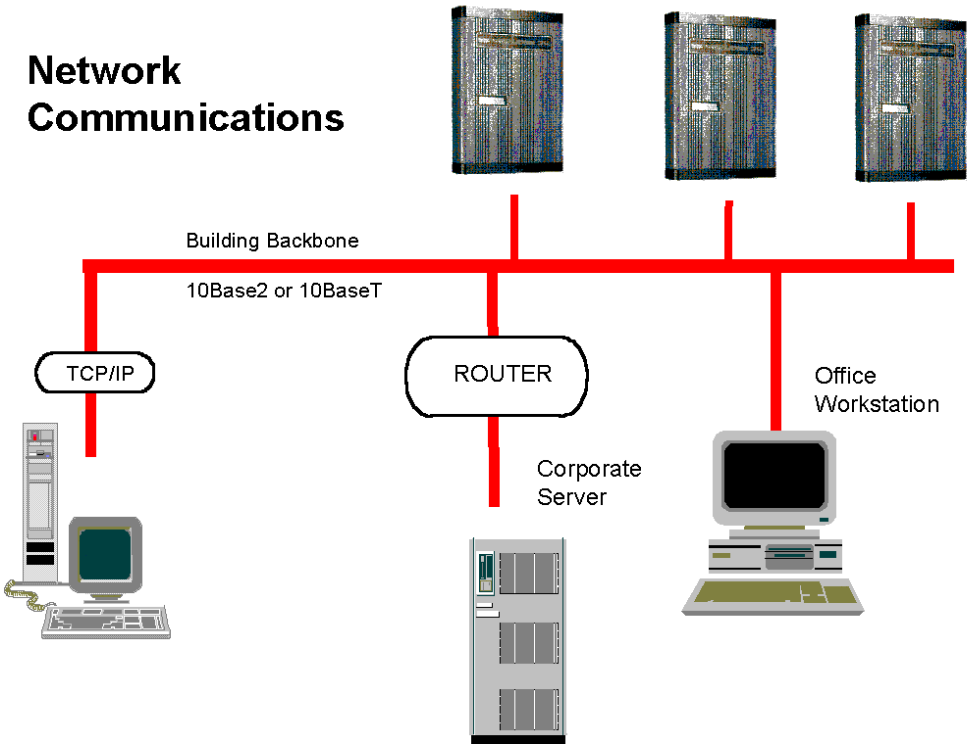
Based on statistical norms with recent and historical data gathered from permanent monitors and survey information, the system could detect and report any degradation in the infrastructure, loads, or electric supply that may lead to a failure in the not-to-distant future. Maintenance can be done at scheduled times before the failure and without lost productivity. A large banking facility in New York City was able to prevent a very costly failure by detecting a problem with the UPS through the discovery of even harmonics that would not normally be present in a properly operating UPS, before it failed to carry the critical load during an interruption. It also minimizes unnecessary scheduled maintenance of transformers, breakers and other system protection equipment, when the information indicates there is nothing to be gained by taking the system out-of-service to look for something that doesn't exist. This can further stretch those already strapped O&M budgets.

Connecting power quality monitors over dedicated or existing corporate LANs is becoming an increasingly common pro-active approach towards fulfilling diagnostic, statistical, and predictive modes of monitoring. An example of such is shown in the figure below.



This concept has grown in the last year to having the capability to view data from anywhere in the world via the Internet and notification of the most critical events through annunicator-type alarms, alphanumeric paging, and other forms of instrument-initiated communication. The user can watch the trends, respond quickly to trouble conditions, and most importantly, improve productivity and profitability with increased up-time and shorten down-times.

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