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For example, the Westinghouse 501G introduced in late 1994, uses the advanced turbine design developed in the DOE program for its first 16 compressor stages. Employing state-of-the-art 3-dimensional computer-aided models, Westinghouse has been able to reduce airfoil thickness and increase the efficiency of each stage without increasing manufacturing costs.

This advanced gas turbine will include features vastly superior to any gas turbine developed to date. The research and development effort has already yielded benefits. Some of the advanced features were deemed so successful that turbine manufacturers incorporated them into current models.

The 501G also incorporates the "piloted ring combustor," also developed in the DOE program. This combustor is a lean premixed multistage design that produces ultra low NOx emissions with excellent combustion stability. The DOE program has also produced new seals that prevent hot combustion gases moving through the turbine from leaking into the environment. These seals proved to be so successful that they were incorporated into the Westinghouse 501G design.

New thermal barrier coatings, also developed under the DOE program, have found their way into the Westinghouse 501G design. The new coatings provide longer life and improved abrasion resistance. Defects in these coatings were difficult to identify after manufacture and post installation service. Today, thermal wave imaging, a new inspection tool developed in the DOE program, can spot defects before they become a problem. Thermal wave imaging is now used in the factory and in field service for identifying defects in thermal barrier coatings in the Westinghouse 501F and 501G designs.

The Fuel Cell: A Revolutionary Way to Generate Electricity

The electric generating industry of the 21st century could look much different than today's industry - both in its make-up and in the technologies it uses to generate power.

For example, because of the Federal investment in the 1980s and early 1990s, a truly revolutionary approach, the fuel cell, is today becoming available for commercial power generation. Relying on electrochemistry rather than combustion, the fuel cell is attractive for both heavily polluted urban areas and remote applications. Not only does