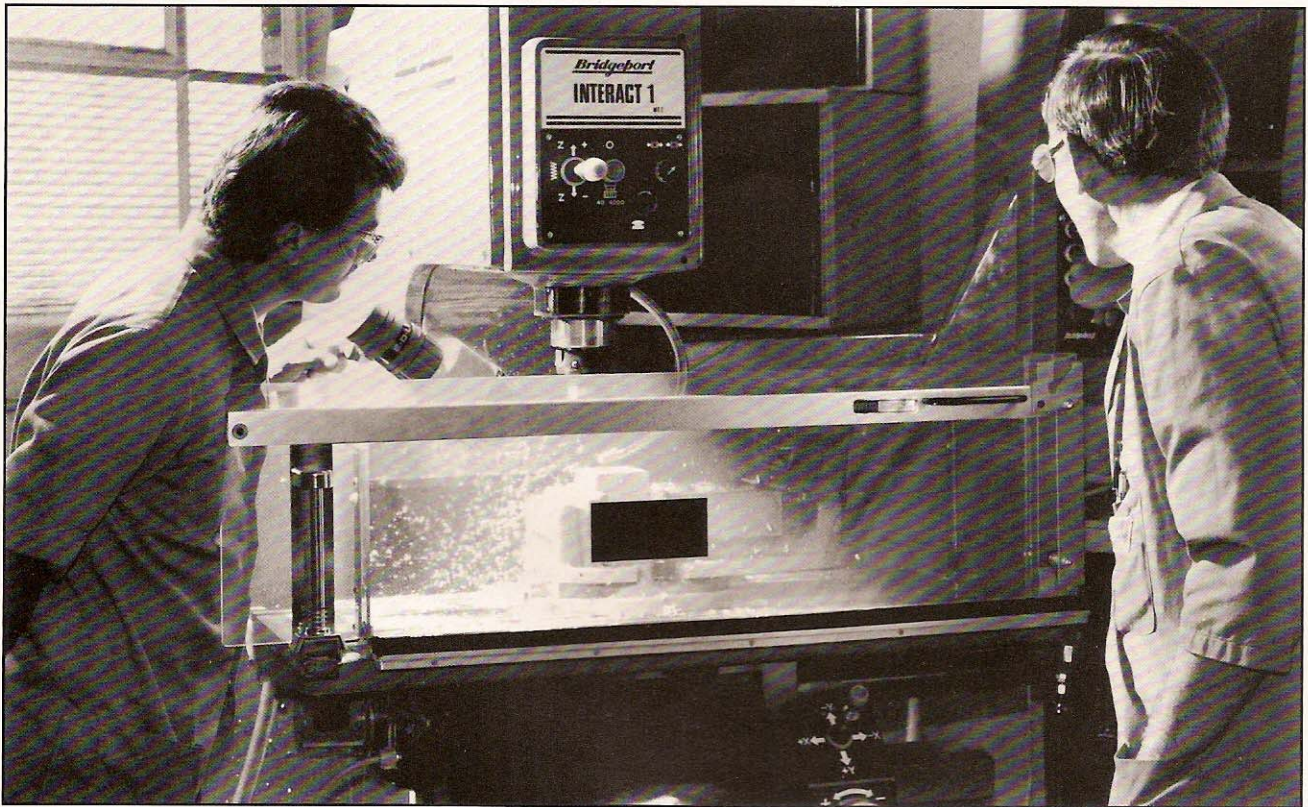


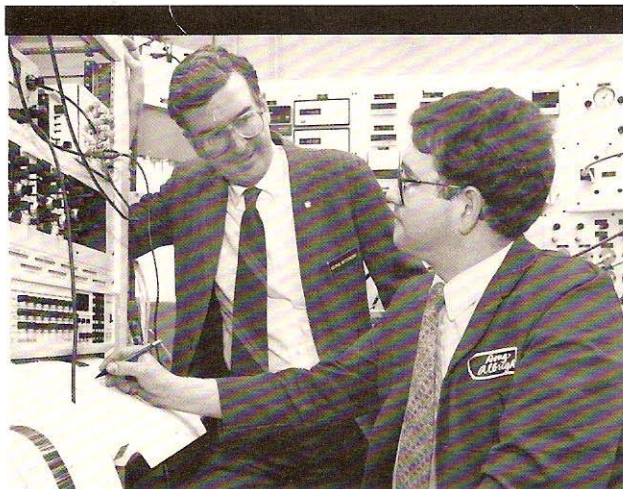
Woodward Governor Company

PRIME TIMES

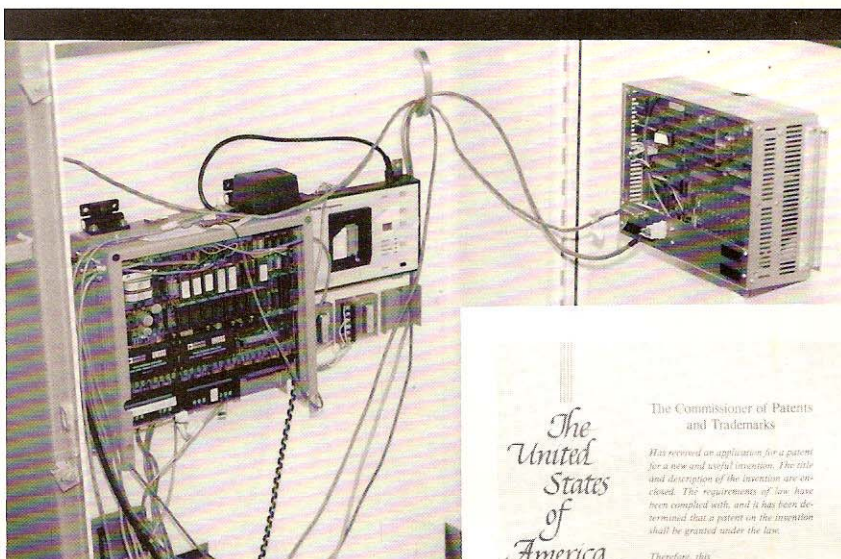
MARCH 1989



In Slough, Kevin Colman (l.) and Pat Alcock run a new Bridgeport milling machine. Its CNC programming and repeatable processes increase Slough's production of PGEG 500 valve blocks, columns, and cam shafts.



Four years after the start of the Hydro project, Doug Albright (foreground) and George Mittendorf were reunited in Aircraft Assembly & Test. In test cell #3, they review a frequency response test for exceptionally close calibration on a large gas turbine control. Generally, one in twenty-five controls undergoes a frequency response test.



The interior of an Index Test Box shows the circuitry involved in this device. Inventor Doug Albright says it is really a test stand for Kaplans. Since you can't bring the Kaplan in from the field for test, you take the stand to the turbine.



WGC patents Hydro Index Test Box

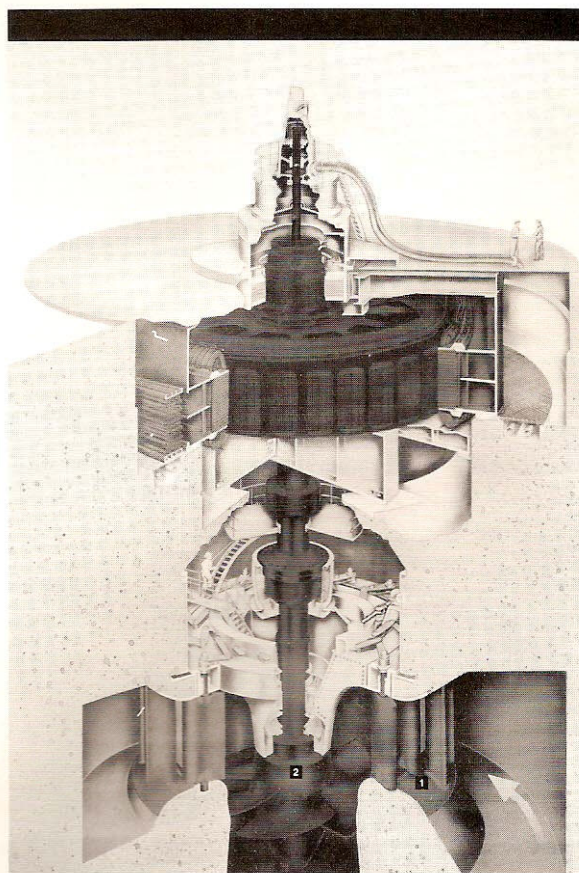
Patent #4,794,544
issued on 27 December 1988

George Mittendorf and Doug Albright assemble and test aircraft controls these days, but they still have ties to the Hydraulic Turbine Controls Division. They began the Index Test Box project for Kaplan turbines in late 1983, but the patent didn't come until late last year.

"The concept was mine, and Doug developed the invention," George said. George was Hydro Engineering manager, and knew Kaplan turbine users needed a device to do index tests automatically. In March 1984, the division funded the research. That May, Doug transferred to Hydro for the work, and George transferred to Slough. So, George said, "In two weeks, I put my idea into his mind...then I left for four years!"

With George's England move, two decades of water turbine experience also left, and Doug had to solo. Hard months of development finally turned George's idea into Doug's hardware.

Doug and George join an elite group of members whose inventions the company patents. Woodward owns the rights to the Index Test Box, but Doug and George are listed as the inventors.



A Kaplan turbine is used in low-head hydroelectric dams to generate power. The wicket gates (#1) surrounding the chamber are adjustable, and so are the turbine blades (#2). This turbine can run at maximum efficiency over a wide range of headwater levels and power demands. Because there are so many variables, the gate-to-blade relationship has to be monitored for efficiency through an index test.