Nuclear research is big business in Fredericton

■ By Chet Wesley

When it comes to nuclear energy, safety and plant longevity are top priority. Using an elaborate system of metal pipes, nuclear reactors generate heat to turn water into the steam that spins electricity-generating turbines. Put a metal pipe and water together, and what do you get? Corrosion, pitting and cracking: a natural chemical reaction that can be detected and slowed by measuring and manipulating the chemical composition of the water that passes through it.

Two inventions by the Centre for Nuclear Energy Research, or CNER, in Fredericton, are now working to assist nuclear stations to monitor corrosion health in ways the industry has never seen.

Before the CNER produced their ground-breaking devices, the only time nuclear stations could measure pipe corrosion health was during scheduled maintenance shut-downs when they could collect and test the highly radio-active liquid. Together with the University of New Brunswick and RPC, and $5 million from ACOA's Atlantic Innovation Fund, the CNER turned their laboratory instruments into devices that can monitor pipe corrosion while the facility is running, allowing operators to make adjustments immediately.

The first device, called ECPro, fits inside the pipe and is designed to alarm facility operators when slight changes in the chemical composition of the water puts the pipeline or the electricity generation process at risk. The second device, called HEPro does the same thing, by attaching a device on the pipe's exterior. The difference is the HEPro measures corrosion health by capturing and measuring tiny non-toxic hydrogen atoms that naturally escape through the metal.

Andy Justason, CNER's general manager, says the two devices are much more than safety mechanisms. "Since you can use them when the plant is online, immediate changes can be made to slow corrosion prolonging the life of the plant, and reduce the amount of nuclear waste," he says. "Both devices can be applied to other industries that have concerns about corrosion caused by constant or changing water flow throughout their tanking, heating or piping systems."

After positively testing the new technology at the Point LePreau facility near Saint John, the CNER and their partners are now poised to take their products to market. Both devices are currently being manufactured at RPC in Fredericton, who Justason says is the only company that knows how to make the patent-pending clamps and seals required.

CNER is now in the process of seeking the funding and sales expertise required to raise their inventions to their full potential for both nuclear and non-nuclear operations, both in Canada and abroad.