

N265. Remote Handling Equipment Aids Bruce Nuclear Power Station

Specially designed tool carriers and work tables, positioned in shielding cabinets against each reactor face, are being used in the latest retubing of CANDU reactors.

The CANDU reactor is built for on-line refueling. The calandria encloses some 480 horizontal pressure tubes arranged in an approximately octagonal matrix. The fueling machines access both ends of these pressure tubes to insert and remove fuel bundles while the reactor is on-line.

The tubes must be replaced about every 15 years due to their elongation under the high neutron flux. Numet Engineering has designed and manufactured retubing tool carriers (RTCs) and work tables for the retubing of the CANDUs at Bruce, which can be operated either manually at the reactor face or remotely.

The RTCs are six-axis, gantry-type cranes which are mounted on the shielding cabinet. They are designed to transport and manipulate irradiated and non-irradiated reactor components, tools, and equipment, both within the shielding cabinet and between the reactor face and other equipment on the reactor vault floor. Combined with the vertical travel of the shielding cabinet, each RTC can access all fuel channels on its reactor face. They are normally operated locally by an operator or remotely via a local area network.

Work tables are multi-axis motorized lift tables, which drive along rails installed in the floor of the shielding. They support, position, insert, and remove tools and equipment during removal and installation phases of retubing. The work table can be also be operated either remotely or locally.

The remote and local control of both RTCs and work tables greatly reduce man-rem by enabling a tool automatically to locate itself with reactor components.

Taken from, "Remote Handling Equipment Aids Bruce," by G.S. Crawford, Nuclear Engineering International, pp. 33-34, Dec. 1993.