

# Control Rod Drive Shaft Button Measurement Tool

## Background

The control rod drive shaft (CRDS™) button measurement tool is a lightweight, manually operated gauging tool. Working from the refueling machine or similar work platform, technicians can position the tool over each CRDS and get two measurements to verify correct rod cluster control assembly (RCCA) engagement. One measurement is the distance between the top surface of the button and the uppermost surface of the CRDS, and the other is the relative heights among all the drive shafts.

## Description

The CRDS button measurement tool is operated manually from the refueling machine or another suitable work platform. The tool fits easily over the CRDS button and accurately measures both the distance from the top surface of the button to the uppermost surface of the CRDS, as well as the relative height of each drive shaft. An internal actuating rod is displaced by the button when the tool is placed over and seated on the drive shaft. The displacement is measured with an internal scale on top of the tool. The tool also employs an outer scale that is used to evaluate relative heights among all the drive shafts. The outer scale is indexed to a fixed reference height using either an optical or a laser transit. The tool's overall length can be adjusted by using rod sleeves of varying length and their accompanying actuating rods.

If there is any indication from the measurement readings that shows improper CRDS-to-RCCA engagement, it is noted and reported to the appropriate utility personnel.

## Benefits

- The CRDS button height measurement tool provides two indications to verify complete and correct CRDS engagement in the RCCA hub.
- Because the tool is lightweight and can be handheld, no cranes are necessary.
- The tool can be used in conjunction with the final drag test of the drive shafts with little or no impact on your schedule, in some cases.

## Deliverables

- CRDS button-height tooling, including sufficient lengths of rod sleeves and actuating rods, as well as applicable spare parts
- Applicable operating procedures and reference materials
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The following deliverables are included as part of field service contract scope:

- Trained and qualified crews necessary to effectively set up, functionally check, deploy and use the equipment
- Tool operation verification of the button heights and the relative heights of all CRDSs, and a written record to the utility
- Equipment removal from water and from work area, disassembly and packaging for shipment including wipedown and/or washdown as directed by site radiation protection

## Experience

In the past, some sites had drive shafts that were not latched, making costly reactor head disassembly necessary. By using the Westinghouse button height measurement tool, utilities can verify that all CRDSs are latched before the reactor head is set in place on the vessel.

Nuclear power plants where the Westinghouse button height measurement tool is used include: Beaver Valley, Indian Point, Sequoyah, South Texas and Comanche Peak.