EPRI Phased Array UT Investigations of DM Welds

- Purposes
- Approaches
- Results so far

PA UT for DM Welds: Purpose

- Provide reliable detection, length sizing, and depth sizing
  - At least as good as conventional UT
  - Good enough to pass Appendix VIII
- Increase inspection speed
  - Reduce exposure
  - Reduce costs

PA UT for DM Welds: OD Approaches

- Focused sector scanning
  - Dual 3x10 element, 1.5 MHz array
  - Contoured wedges
  - Scan parallel to the weld, 2-6 strokes
- Linear scanning
  - Dual 64-element, 2 MHz array
  - Water wedge
  - Scan parallel to weld, once

PA UT for DM Welds: ID Approach

- Focused sector scanning
  - Dual 3x10 element, 1.5 MHz array
  - Contoured wedge
  - Scan parallel to the weld, 2-6 strokes

PA UT for DM Welds: Results so far

- Detection and sizing of circumferential flaws is excellent, for all diameters 4" to 36"
- Detection and sizing of axial flaws is good, if we can scan on the weld crown
- PWR nozzle-to-safe end weld from ID:
  - Detection and sizing of circumferential flaws is excellent
  - Detection of circumferential flaws should be very good even in presence of counterbore
  - Axial flaws will be a problem if there is a counterbore; this probe is pretty big

PA UT for DM Welds: Workplan

- Automated and Manual UT
  - 2001 - develop a qualifiable procedure; qualify it, if a PDI test is available in time
  - 2002 - deliver into field service
- Much collaboration, overlap between manual and automated investigations