2007 AUG Survey

Survey conducted Sept. 2007 until Nov. 2007

Survey

- 26 Questions
- Sent to 69 stations
- 59 stations responded
- 56 of 65 U.S. stations responded (86%)
- 41 stations were PWRs
- 18 stations were BWRs

PWR Stations

- 4 – B&W
- 2 – CANDU
- 7 – CE
- 4 – Westinghouse 2 Loop
- 7 – Westinghouse 3 Loop
- 16 – Westinghouse 4 Loop

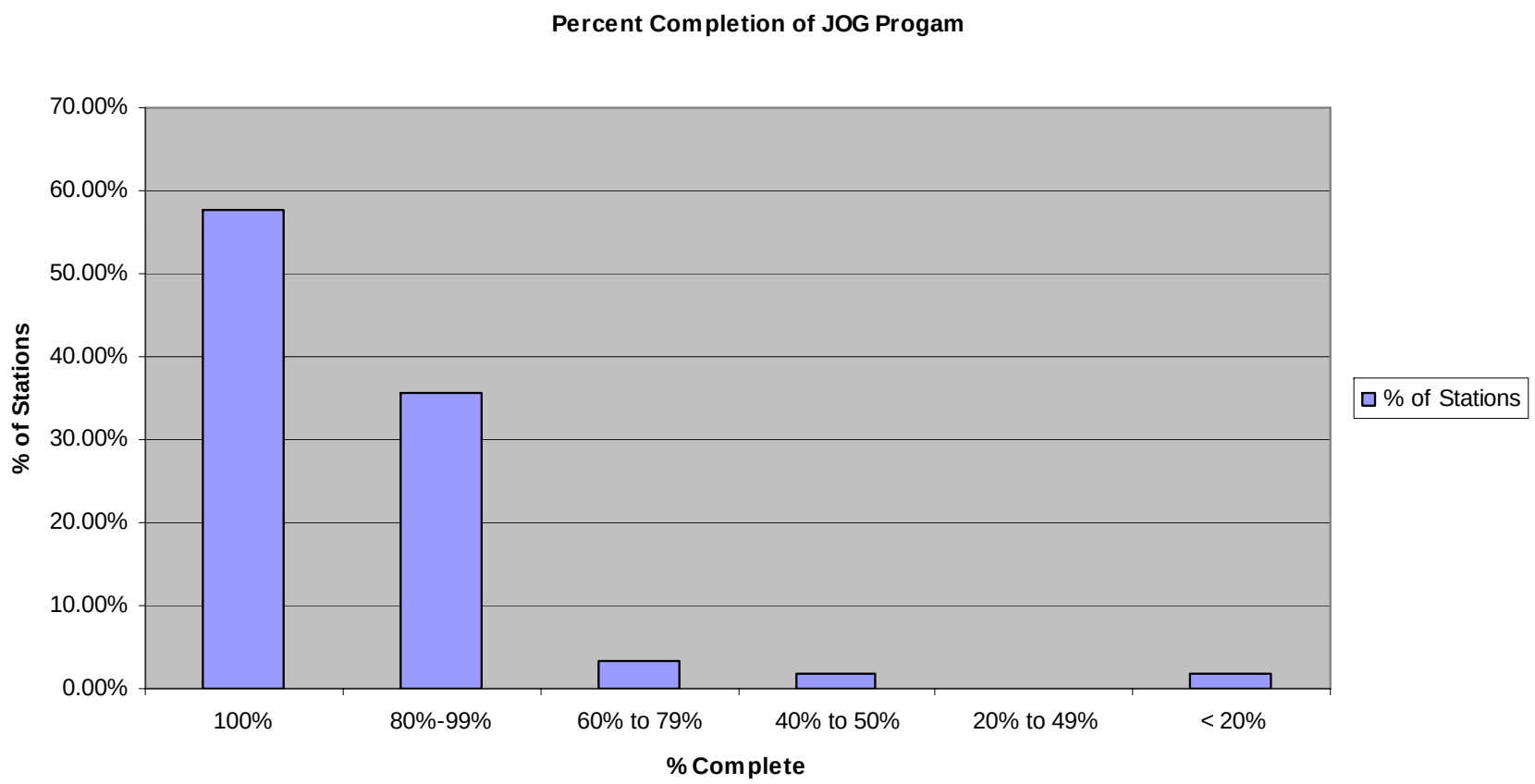
BWR

- 5 – BWR 3
- 7 – BWR 4
- 1 – BWR 5
- 4 – BWR 6
- 1 – BWR Other

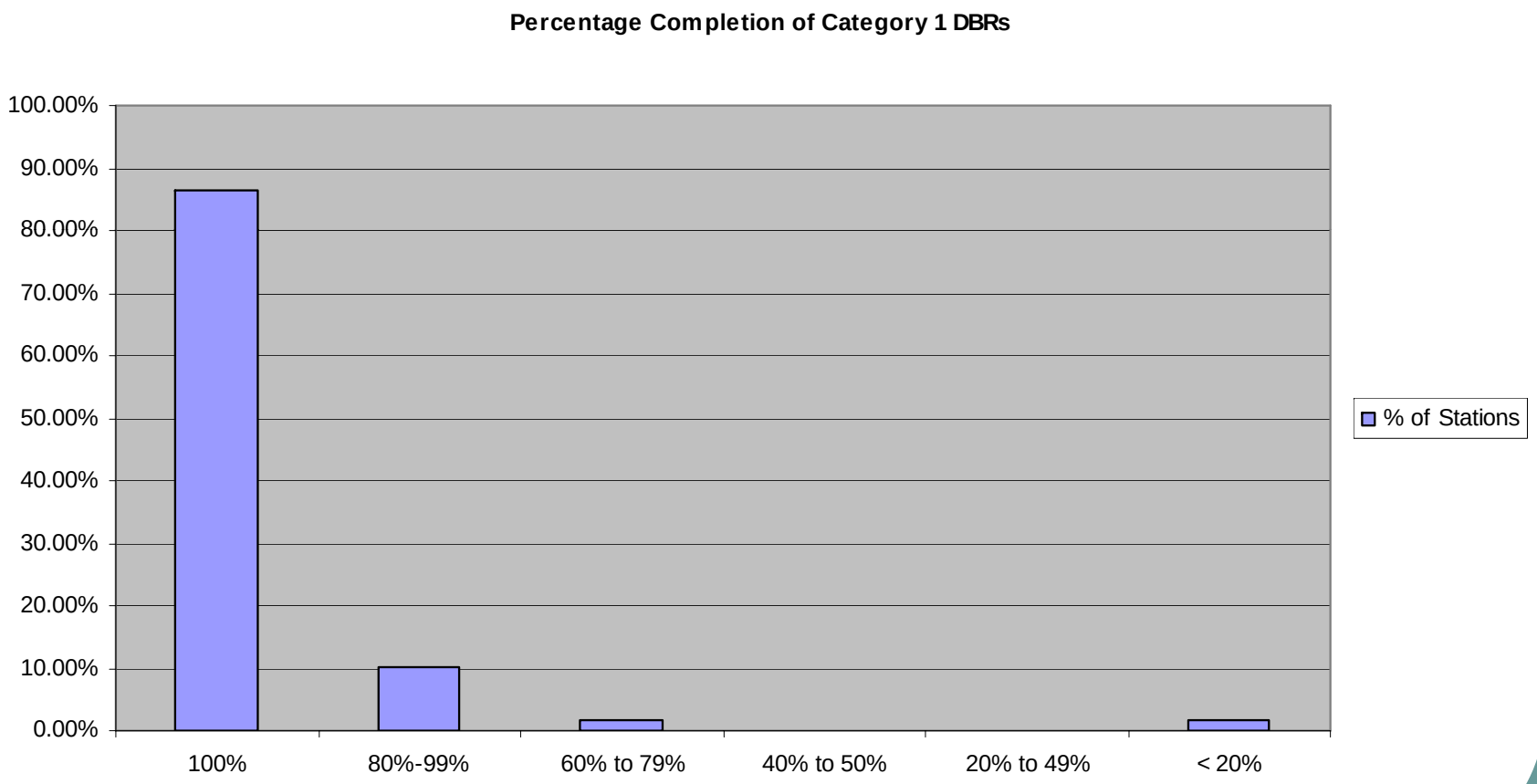
JOG AOV Program

- 98.3% Implementing JOG AOV Program
  - Other was implementing a program similar to the NRC RIS 2000-03

Percentage Completion of JOG AOV Program



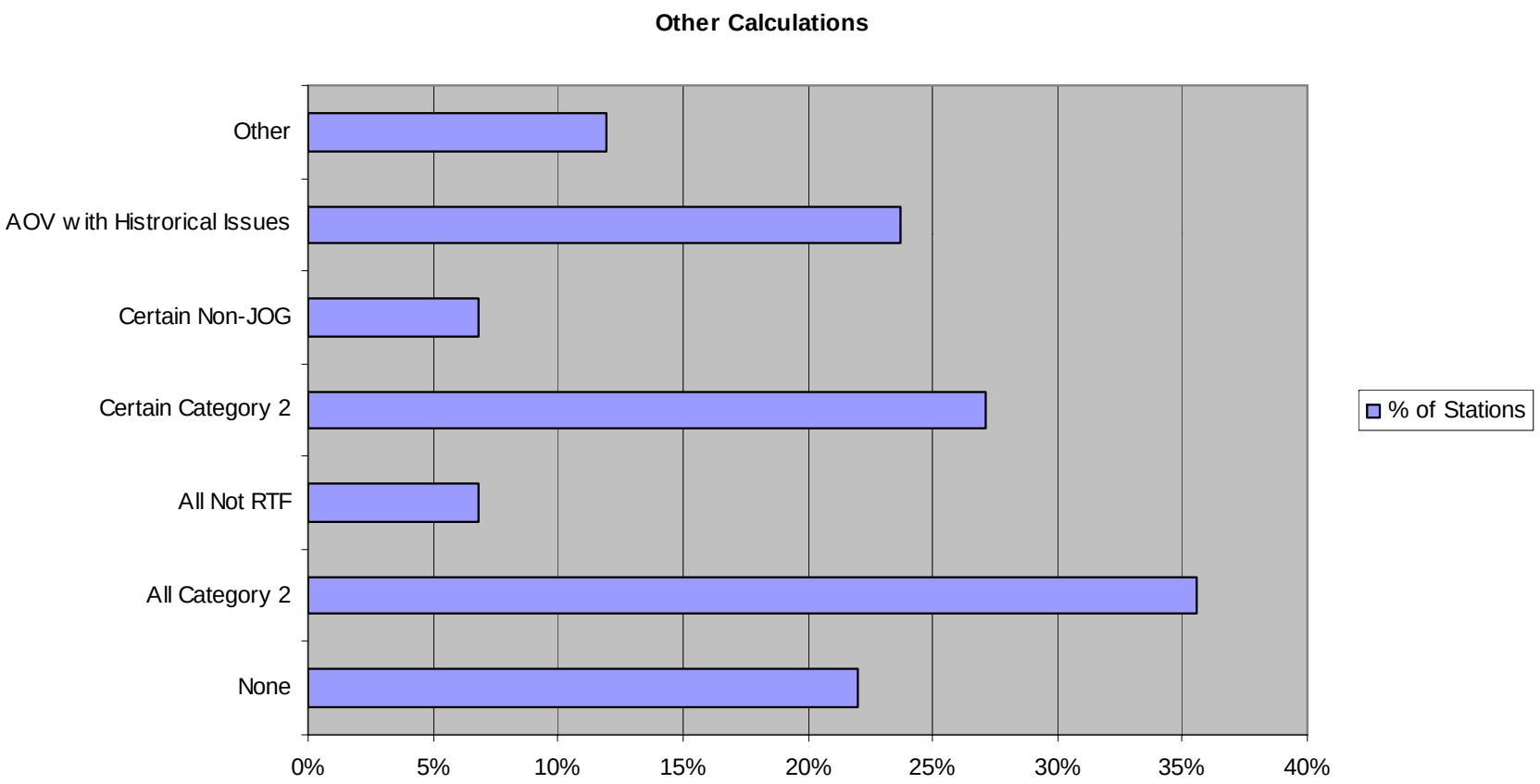
Percentage Completion of Category 1 DBRs



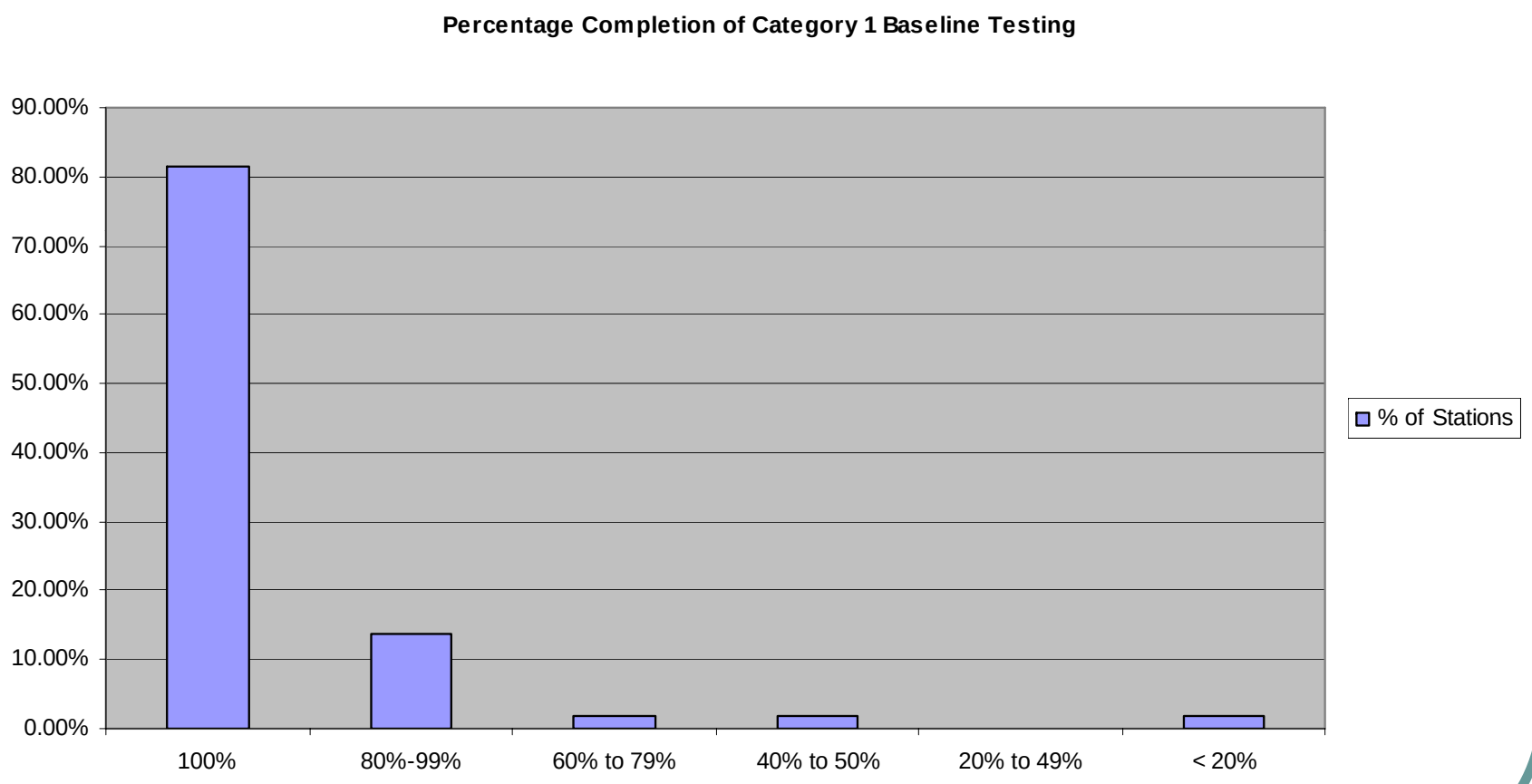
Negative Margin AOVs

- 86.4% Answered “No”
- Remainder
  - Performed modifications to correct
  - Increased diagnostic testing frequency
  - Performed DP Testing and plans to modify
  - Performed Evaluations documented in calculations
  - Revised the calculations to remove conservatisms

Performing Other Calculations



Percentage Complete of Category 1 AOV Baseline Testing



Tracking and Trending

- 83.1% of Stations are performing Tracking and Trending
- Parameters being Tracked and Trended
  - Performance – test results
  - Failures
  - Margin
  - Thermal Performance
- Changes as a result of Tracking and Trending
  - PM Frequencies
  - Design Changes
  - Packing Training
  - Procedure Changes
  - Calculation Revisions

Strain Gauges and AOV Issues

- Routinely testing with strain gauges
  - 25% stated “Yes”
- Biggest AOV Issues
  - Accessories – positioners, regulators, controllers, solenoid valves, limit switches
  - Packing
  - Actuator
  - Valve – leakby, stem wear, internal
  - Obsolescence
  - Lack of resources
  - Lack of PMs
  - Calculation updates

BWR

- Category 1 AOVs Average per unit 20 - not including the HCU AOVs
- Category 2 AOVs Average per unit 74 – not including the HCU AOVs
- Non Run to Failure – 440 AOVs on Average (High - 1202, Low – 90)

BWR

- Site's Largest Valve Manufacturer (% rounded)
  - 11% Copes-Vulcan
  - 44% Fisher
  - 11% Masoneilan
  - 11% Hammel Dahl
  - 0% ITT Grinnell
  - 22% Other

BWR – Digital Positioners

- 28% or 6 sites have installed Digital Positioners
  - 3 sites with Fisher DVC Positioners
  - 1 site with a Masoneilan SVI II
  - 1 site with a CCI
  - 1 site with a Siemens SIPART PS-2

BWR – AOVs Worked During Outages

- Average number of AOVs worked during outage is 74 per unit
  - BWR 3 – 74 per outage
  - BWR 4 – 81 per outage
  - BWR 5 – 100 per outage
  - BWR 6 – 54 per outage

BWR – Future Survey Topics

- Number of diagnostic tests performed in an outage
- Are MSIVs in your AOV Program
- Does categorization include critical AOVs
- Training
- AOV PM Program Implementation (tasks, freq., etc.)
- Post Maintenance Testing Requirements
- Use of Digital Valve Positioners
- Control Valve Troubleshooting techniques

PWR

- 44 - Category 1 AOVs Average per unit
- 215 - Category 2 AOVs Average per unit
- 539 - Non Run to Failure – 440 AOVs on Average (High - 1443, Low – 50)

PWR

- Site's Largest Valve Manufacturer (% rounded)
  - 16% Copes-Vulcan
  - 50% Fisher
  - 24% Masoneilan
  - 5% Hammel Dahl
  - 3% ITT Grinnell
  - 3% Other

PWR – Digital Positioners

- 55% or 21 sites have installed Digital Positioners
  - 20 sites with Fisher DVC Positioners (5000 or 6000)
  - 2 sites with Masoneilan SVIs (I or II)
  - 2 sites with ABB TZIDs
  - 1 site with a Westlock ICOT

PWR – AOVs Worked During Outages

- Average number of AOVs worked during outage is 69 per unit
  - B&W – 55 per outage
  - CE – 50 per outage
  - CANDU – 75 per outage
  - 2 Loop Westinghouse – 59 per outage
  - 3 Loop Westinghouse – 74 per outage
  - 4 Loop Westinghouse – 79 per outage

PWR – Future Survey Topics

- Effects of updated PRA on Categorization
- Tracking and Trending, Setpoint Control, and Calculation Revisions
- Post-Maintenance Testing Requirements – including testing methods
- Obsolescence
- Valve Team organizational structure
- Digital Positioners – including types of position feedback used and problems encountered
- Instrument Air Quality
- List of problem valves
- Use of Teflon packing in radiation areas
- Use of Test Connections
- Category 1 AOVs in the LLRT program and AOVs listed as MR a1
- Design Changes and results for Copes Vulcan Tandem Trim