Joint Owners' Group (JOG)
MOV Periodic Verification (PV) Program

Overall Summary of JOG PV Program

JOG-NRC Meeting

October 1-2, 2003

Genesis of JOG PV Program

Response to GL 96-05:

- B&WOG, BWROG, CEOG & WOG created JOG PV to help plants address GL 96-05
  - Potential degradation in required DP thrust or torque
- JOG contracted MPR Associates to prepare initial program description, manage/evaluate JOG dynamic test data and develop final report
- Program Description (MPR-1807) was developed
  - Identified degradation mechanisms and range of associated conditions
  - Submitted to NRC in March 1997 with SER received on Oct. 30, 1997

Genesis of JOG PV Program (cont'd)

Program Description (MPR 1807) - 3 Phases

- Interim: provided immediate approach for plants to use in their GL 96-05 programs
  - Established intervals for static testing based on risk and margin
- Dynamic Testing: basis for addressing potential degradation (increases) in required thrust or torque under DP conditions
  - 5-year industry testing program
  - 176 valves repeat DP tested in plants
  - Utilized a standard JOG testing specification
- Final Program: analysis, evaluation of test data with final PV program recommendations for participating utilities

JOG Organization

4 Owners' Groups

- B&WOG, BWROG, CEOG & WOG
- 62 plants
- 98 units

OG Core Groups

- ~5 Members each
- OG Core Groups combined to form JOG Core Group

JOG Core Group

JOG Core Group Functions

- Direct all JOG PV Program activities
- Represent participating utilities
- Make JOG policy decisions
- Manage contractor (MPR) work
- Review/approve dynamic test results/trending analyses
- Initiate additional investigations, as needed, based on data
- Review/approve Feedback Notices
- Develop final program recommendations
- Report status to NRC in periodic meetings

Rapid Attention

Timely evaluation by the JOG Core Group of any potential large degradation trends.

- Defined in initial Program Description (MPR-1807)
- Triggered by increases in valve factor or bearing friction coefficient >10% (beyond uncertainty)
- Reviewed data and identified whether further actions were required
- Agreed on final disposition
- Issued Feedback Notices, if needed, to industry

Feedback Notices (FN)

Means of communicating relevant testing information back to participating utilities

- Defined in initial Program Description
- JOG has shared FNs with NRC during status meetings

FN-01, Rev.2 *(May 2002)*: valves with "low" valve factors may increase with DP stroking

FN-02, Rev.0 *(Oct. 1999)*: potential impact of under-filled matrix categories on Program coverage

FN-03, Rev.0 (*Feb. 2000*): behavior of gate valves after valve disassembly

FN-04, Rev.0 (*Sept. 2003*): bearing friction variations for butterfly valves with bronze bearings in raw water service

JOG Core Group Meetings

- 2 meetings per year in 1998-2002; 4 meetings in 2003
- Purpose of CG Meetings:
  - Review test package results, traces, trends
  - If necessary, request additional plant test information
  - Discuss/disposition Rapid Attention valves
  - Direct MPR work or analysis based on received and evaluated test data
  - Make decisions regarding utility Feedback Notices
  - Provide comments and input to Final Program

JOG-NRC Meetings

- 2 meetings per year in 1998-2002; 1 meeting in 2003
- Purpose of JOG-NRC meetings:
  - ▸ NRC briefing on GL 96-05 status & issues
  - ▸ JOG response to Staff GL 96-05 issues/questions
  - ▸ JOG sharing of:
    - Program status
    - Testing schedule performance
    - Testing results and trends
    - Tentative conclusions on degradation
  - ▸ NRC comments and insights to the JOG PV Program

Scope of JOG PV Dynamic Test Program

- JOG PV Topical Report (MPR-1807) included idealized matrix
  - ▸ 150 total valves
  - ▸ 25% attrition allowance
  - ▸ Goal: obtain data from at least 113 valves
- Actual Test matrix
  - ▸ 198 test valves initially identified
  - ▸ 11% attrition (22 valves) -- *less than planned*
  - ▸ 176 final test valves -- *63 more than original goal*

Dynamic Testing Summary

- 162 of 176 valves have all three DP tests
- 14 valves have two DP tests
  (could not achieve successful third test)
- 514 total test packages
  - 9 still in approval process

These 514 tests represent the most substantial set of MOV repeat DP test data in existence.

Industry Efforts on JOG PV Program

- 8,000 man-hours by Core Group
- 28,000 man-hours for contractor
- 6,500 man-hours JOG Project Management
- 61,000 man-hours for utility dynamic testing

52 man-years

Key JOG PV Program Conclusions

- **NO AGE-RELATED DEGRADATION**
  - No increase in required thrust or torque due only to the passage of time (without DP stroking)

- **GATE VALVES**
  - No service-related degradation (with DP stroking) in required thrust, except for certain conditions
    - Low initial valve factors due to disassembly or limited DP stroking in service are susceptible to increases with DP stroking, up to a stable level

Key JOG PV Program Conclusions (cont'd)

- **BUTTERFLY VALVES**
  - No service-related degradation in required bearing torque
  - Some valves show variation (no trend) in bearing friction
    - Bronze bearings in untreated water without a hub seal
    - Non-metallic bearings

- **GLOBE VALVES (Balanced and Unbalanced)**
  - No service-related degradation in required thrust

JOG PV Final Report

JOG will issue a new Topical Report to document the program conclusions and implementation approach for GL 96-05 MOV Periodic Verification

- MPR-2524, "Joint Owners' Group (JOG) Motor Operated Valve Periodic Verification Program Summary"
- Incorporates SER issued on original Topical Report, as requested by NRC
- Incorporates the content of all Feedback Notices; current FNs will be superseded by the new Topical Report

JOG PV Final Report Schedule

Year	Date	Activity
2003	*August 21*	Draft of JOG report issued to participating utilities for industry review
	October 1-2	JOG/NRC meeting to discuss program conclusions and draft report
	October 10	Industry comments due
	November 17-20	JOG Core Group meeting to disposition industry comments
2004	*January*	Revision 0 of JOG Final Report issued to Owners Groups for approval
	February	Revision 0 of JOG Final Report submitted to NRC
	August	Anticipated SER

Joint Owners' Group (JOG)
MOV Periodic Verification (PV) Program

JOG-NRC Meeting
October 1-2, 2003

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Overview of Final Periodic Verification Approach

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Final PV Approach

- Builds on current interim PV approach
  - ► Static testing based on margin* and risk ranking
  - ► Addresses potential for increases in required thrust (gate valves) or torque (butterfly valves) – actions *beyond* static testing are required

  * Margin as defined by JOG PV (MPR-1807 and MPR-2524)
- Incorporates key observations from DP testing by classifying in-plant valves into 1 of 4 classes:
  - ► *Class A*
  - ► *Class B*
  - ► *Class C*
  - ► *Class D*

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Final PV Approach (cont'd)

Risk Ranking	PV Test Interval (years) for...		
	Low Margin	*Medium Margin*	*High Margin*
High Risk	2	4	6
Medium Risk	4	8	10*
Low Risk	6	10	10*

Low Margin: JOG PV Margin < 5%

Medium Margin: 5% ≤JOG PV Margin < 10%

High Margin: 10% ≤JOG PV Margin

* Intervals beyond 10 years can be used, although it is the responsibility of each plant to justify longer intervals.

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Final PV Approach (cont'd)

CLASS A

- Class A valves are not susceptible to degradation, as supported directly by JOG PV testing or EPRI PPM
- Static PV testing required
  - verify proper MOV setup
  - quantify margin
  - provide any needed information for plants to address actuator degradation
- For PV interval, valves with margin >0 are considered to have high margin

Final PV Approach (cont'd)

CLASS B

- Class B valves are not susceptible to degradation. This conclusion is based on JOG PV test results, extended by analysis and engineering judgment to configurations and conditions beyond those tested.
- Static PV testing required
  - Verify proper MOV setup
  - Quantify margin
  - Provide any needed information for plants to address actuator degradation
- PV interval determined from table

Final PV Approach (cont'd)

CLASS C

- Class C valves are susceptible to changes in required thrust or torque, as supported by JOG PV test results. Potential increases in required thrust or torque need to be accounted for in valve setup and margin evaluation.

- "Allowance" specified for each Class C valve to be considered in computing margin
  - Based on design attributes, service application and valve setup information
  - Must be considered for each 2-year period

Final PV Approach (cont'd)

CLASS C *(cont'd)*

- Static PV testing can be used, considering allowance, to determine margin
- Valves with margin (including allowance) < 0
  - MOV or setup should be modified to achieve positive margin

    or

  - Valve should be DP tested on a 2-year interval

Final PV Approach (cont'd)

CLASS D

- Valves in Class D are not covered by the JOG PV Program.
- Individual plants are responsible for justifying the PV approach for these valves.

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Final PV Approach (cont'd)

- For each valve type (gate, butterfly or globe valves), a methodology is presented for determining valve classification
  - **Valve Information Table** – information needed by user to evaluate PV approach for valve
  - **Procedure + Flow Chart** – step-by-step decision logic for determining classification of valve
  - **Configuration and Application Information (*CAI*) Rating Chart** – logic for evaluating valve design attributes and applications to determine rating
    - covered directly by JOG testing (rating of *0* or *1*)
    - covered by extension of JOG test results (rating of *2*)
    - not covered by JOG testing (rating of *3*)

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JOG Program Results and Periodic Verification – Globe Valves

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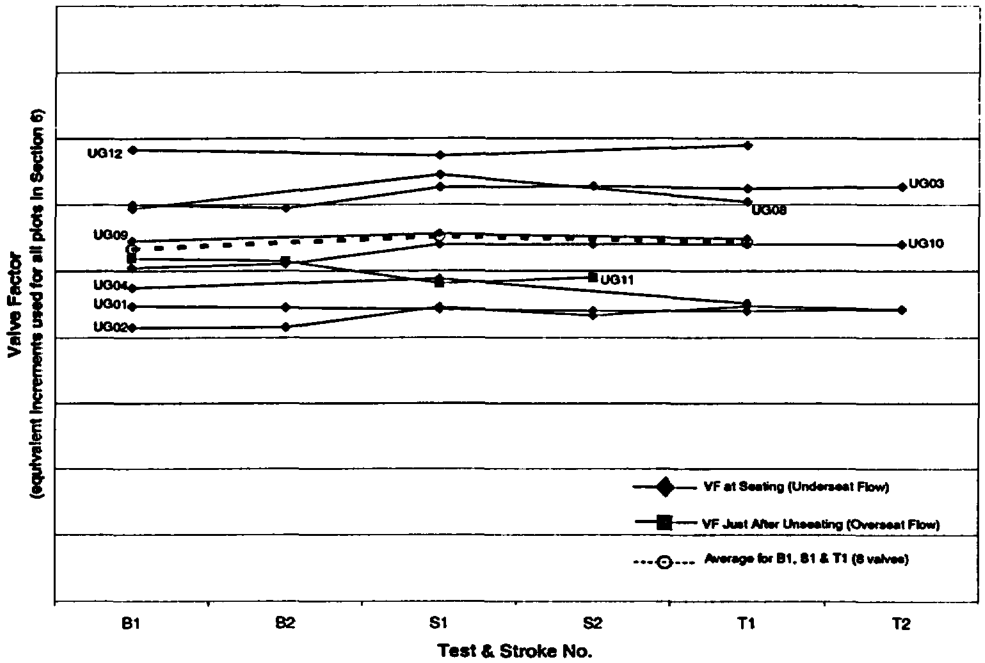
Unbalanced Disk Globe Valve Test Results

- Valves in water systems show no degradation
  - Observed valve factor differences between tests of each valve are within instrument uncertainty
  - Results validate Topical Report (MPR-1807) position of no degradation mechanisms
- Valves in steam systems show no degradation
- Based on EPRI testing, valves with high compressible flow velocities could lead to elevated side and friction loads
  - No evidence of elevated loads at JOG test flow velocities
  - Method to classify unbalanced globe valves considers flow velocity

MPR

Unbalanced Disk Globe Valves - Water Systems



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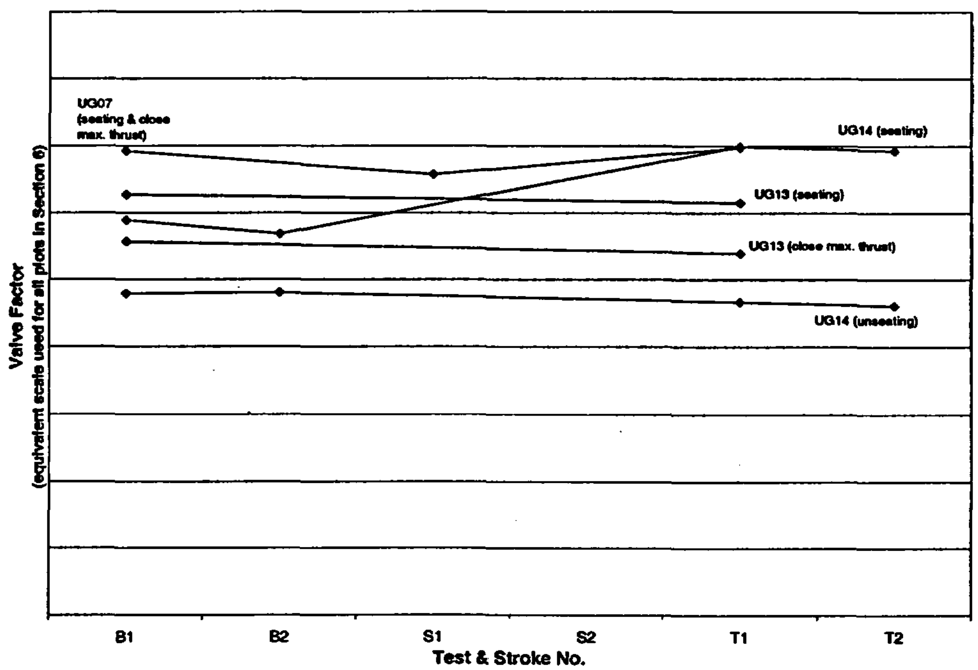
Unbalanced Disk Globe Valves - Steam Systems



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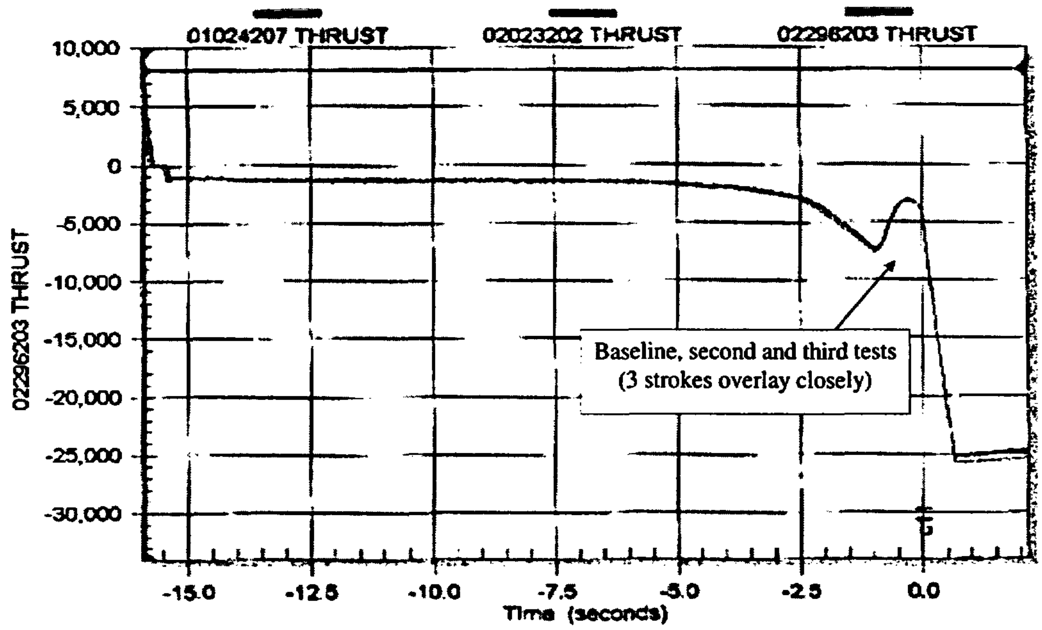
Thrust Overlay for Closing Strokes of UG13



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Evaluating Measurement Uncertainty

To characterize the effect of measurement uncertainty:

- Determine bounds (+ and -) of valve factor based on contributing uncertainties
- Show bounds on graph of valve factor
- Determine if a "series alley" exists – lowest point of upper bound line exceeds highest point of lower bound line
- Existence of series alley means that it is possible (although not certain) that the observed differences are within measurement uncertainty
  - Data points may fall inside and outside of series alley
- Lack of series alley indicates that the observed difference is a change

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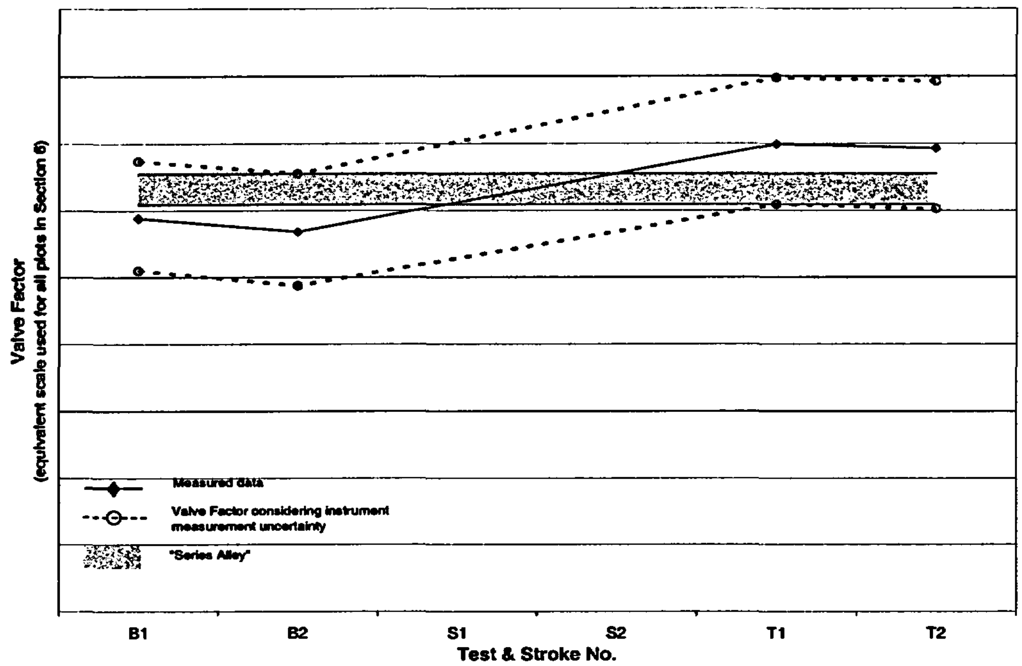
Evaluation of Measurement Uncertainty for UG14 – At Seating



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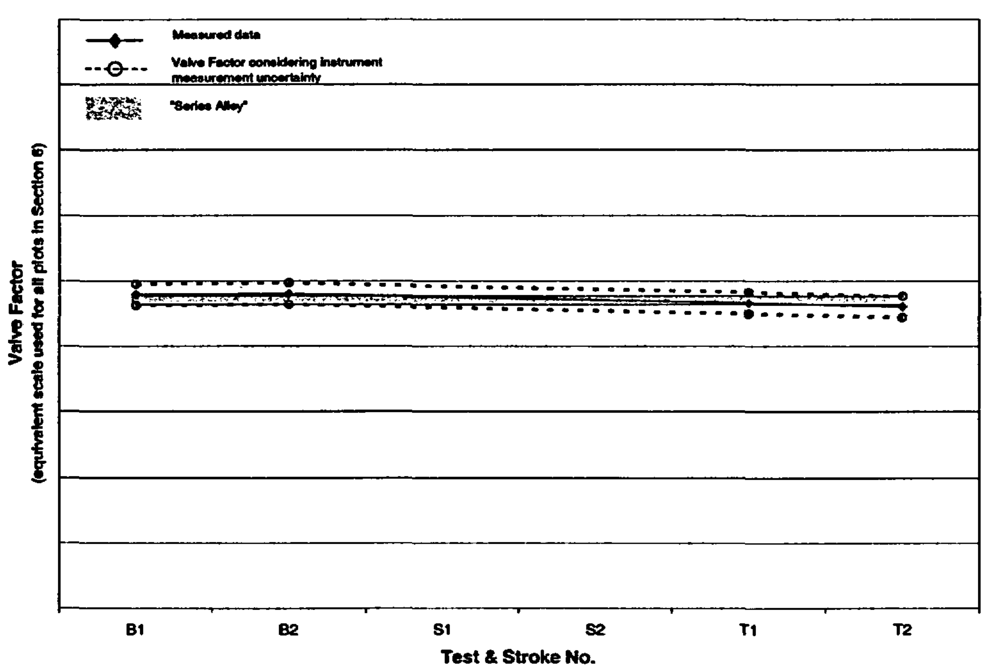
Evaluation of Measurement Uncertainty for UG14 – At Unseating



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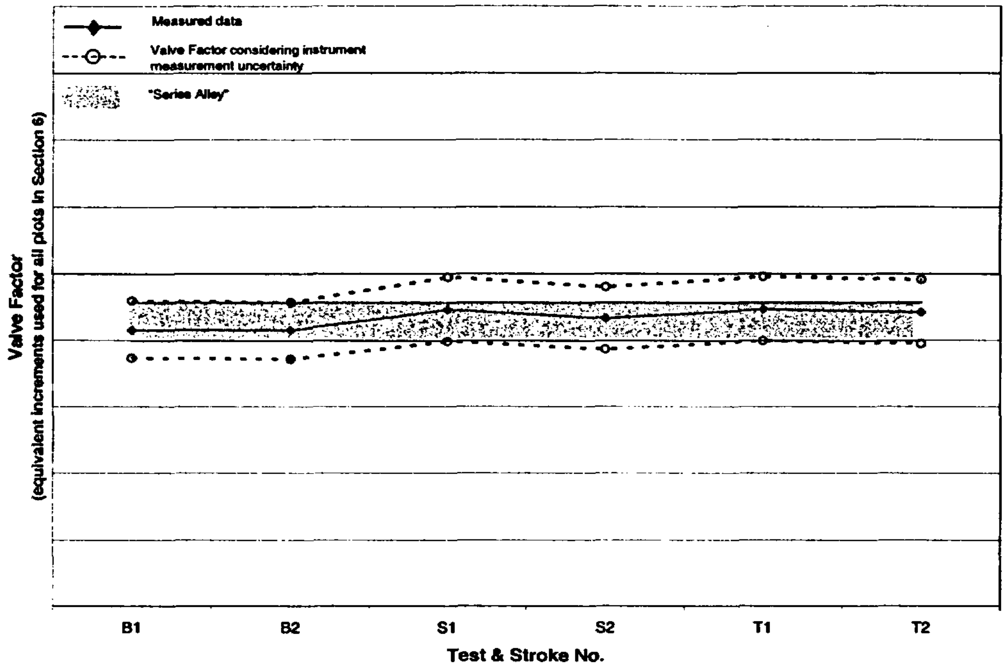
Evaluation of Measurement Uncertainty for UG02



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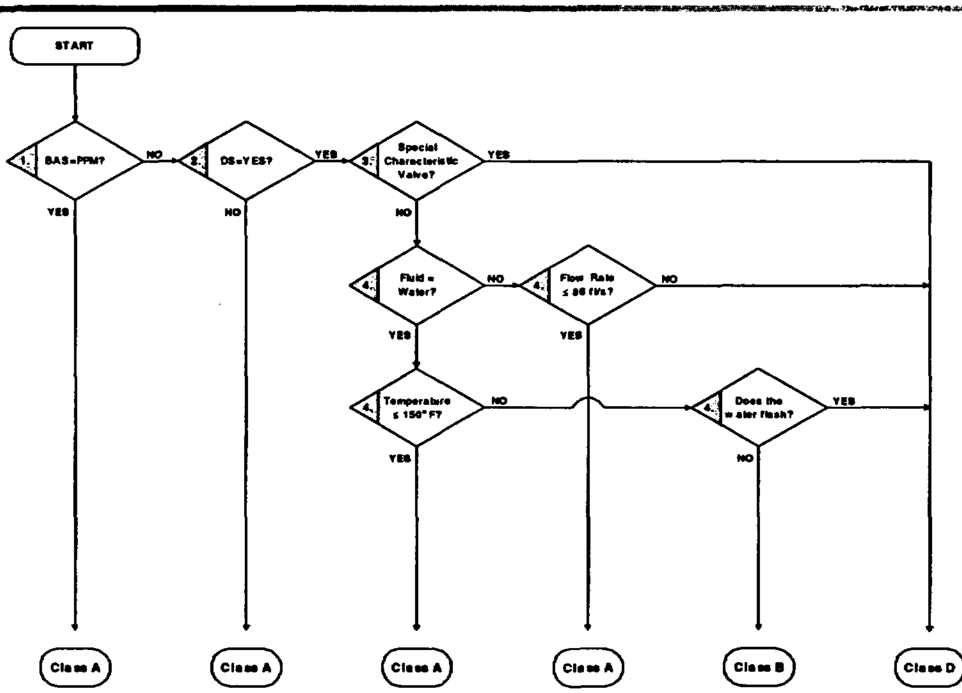
Method to Classify Unbalanced Disk Globe Valves



MPR

Method to Classify Unbalanced Disk Globe Valves (cont'd)

- Step 1: Valves evaluated using EPRI PPM are considered to be Class A
- Step 2: Valves evaluated based on frequency of in-service DP stroking
  - Valves that do not stroke against DP → Class A
  - Valves that do stroke against DP are evaluated further
- Step 3: Valves with rising/rotating stems that stroke open against DP with overseat flow are Class D

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Method to Classify Unbalanced Disk Globe Valves (cont'd)

- Step 4: Valves evaluated based on fluid conditions
  - Water ≤150°F → Class A *(covered by testing)*
  - Steam with flow velocities ≤ 86 ft/sec → Class A *(covered by testing)*
  - Non-flashing water > 150°F → Class B *(covered by extension)*
  - Flashing water or steam flow velocities > 86 ft/sec → Class D
    - Conditions not tested by JOG
    - Potential concern that conditions could lead to elevated disk side loads and friction loads

MPR

Balanced Disk Globe Valve Test Results

- Required DP thrust is small (*expected*)
- Valves showed no degradation
  - Observed valve factor differences between tests of each valve are within instrument uncertainty
  - Valves in raw (untreated) water systems show thrust variation unrelated to DP thrust

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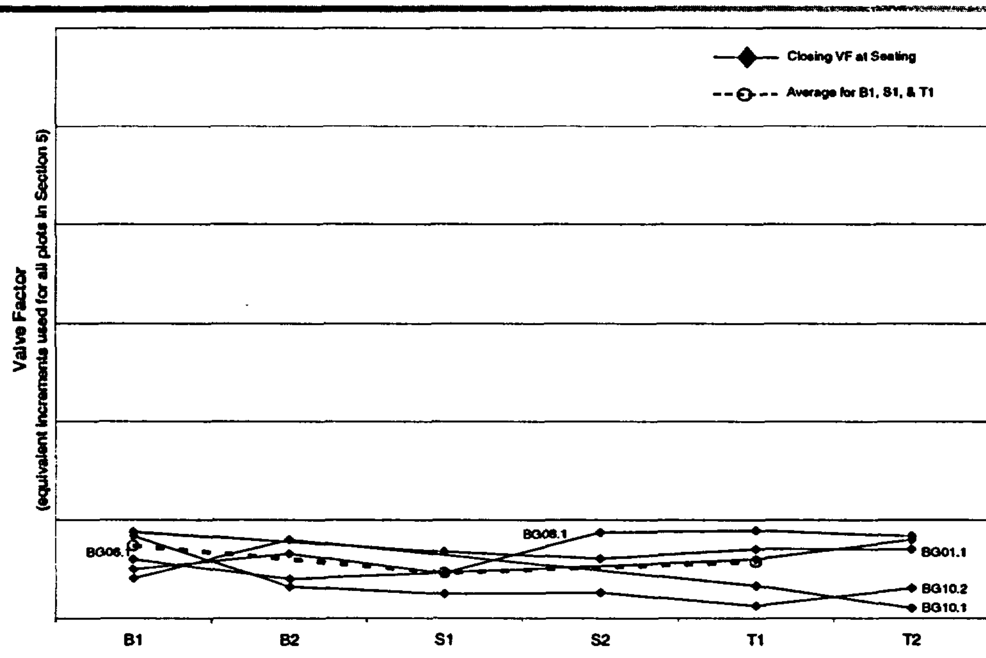
Balanced Disk Globe Valves – At Seating



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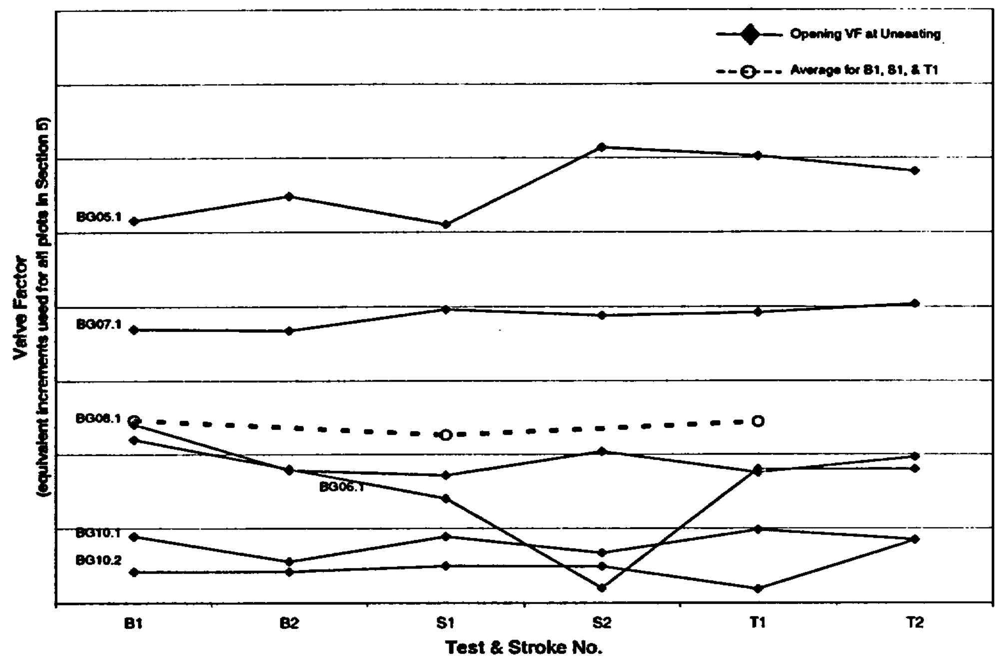
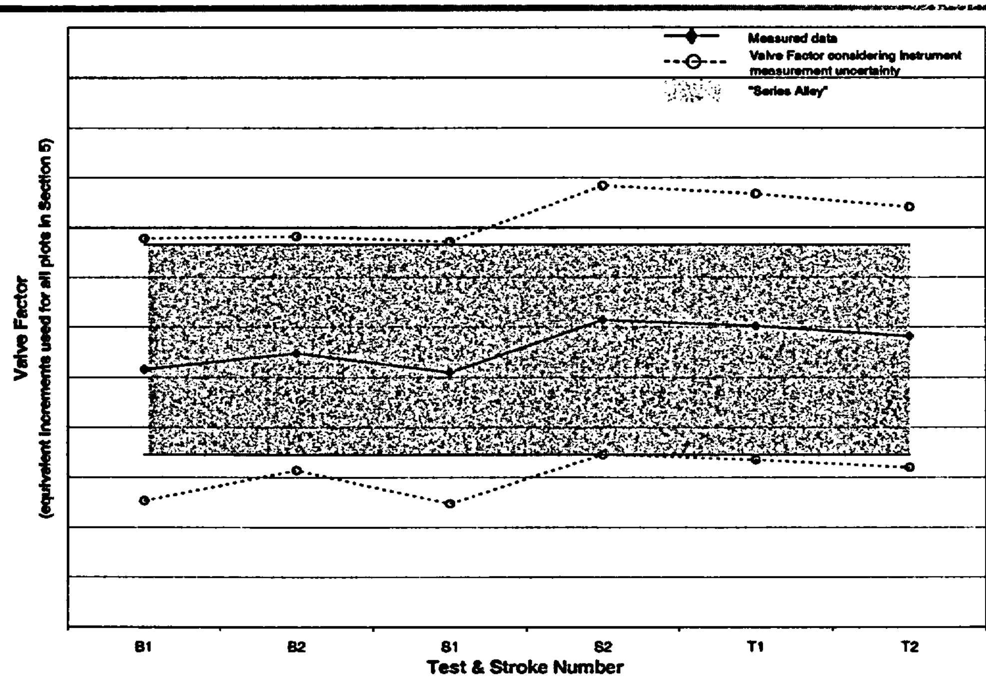
Balanced Disk Globe Valves – At Unseating



MPR

Evaluation of Measurement Uncertainty for BG05.1



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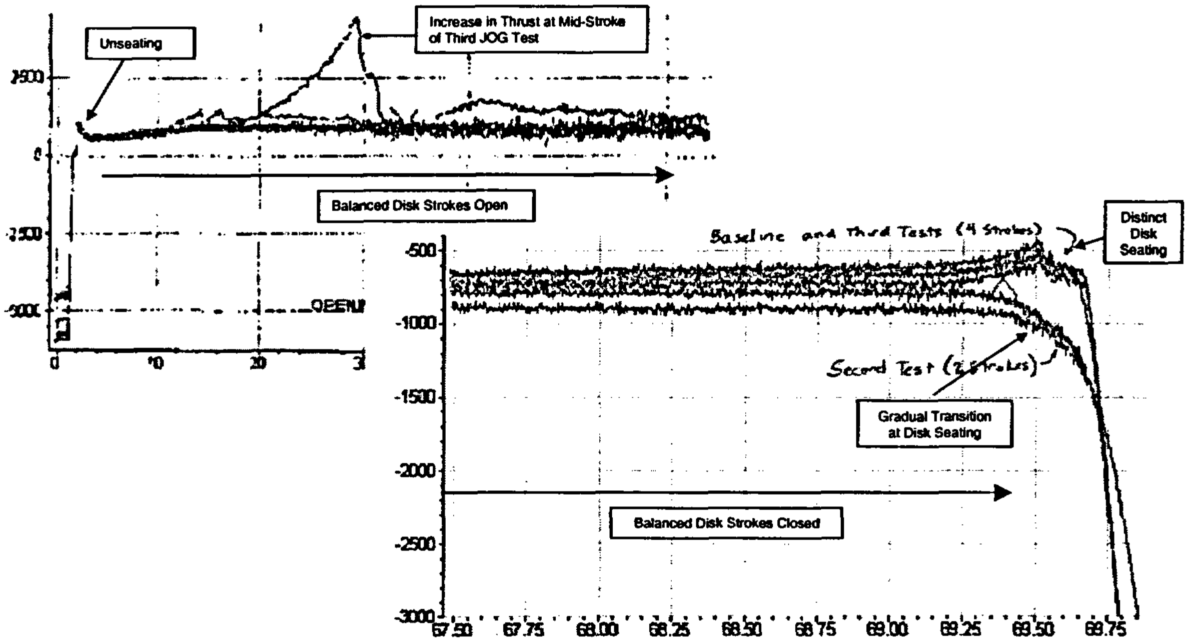
Examples of Balanced Disk Globe Valves in Raw Water Systems



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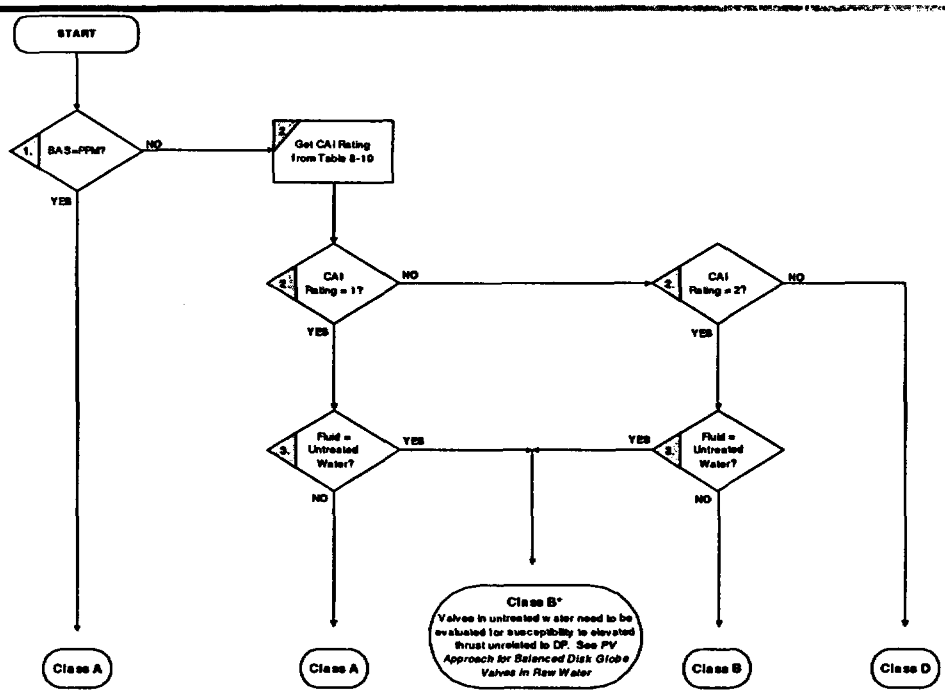
Method to Classify Balanced Disk Globe Valves



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Method to Classify Balanced Disk Globe Valves (cont'd)

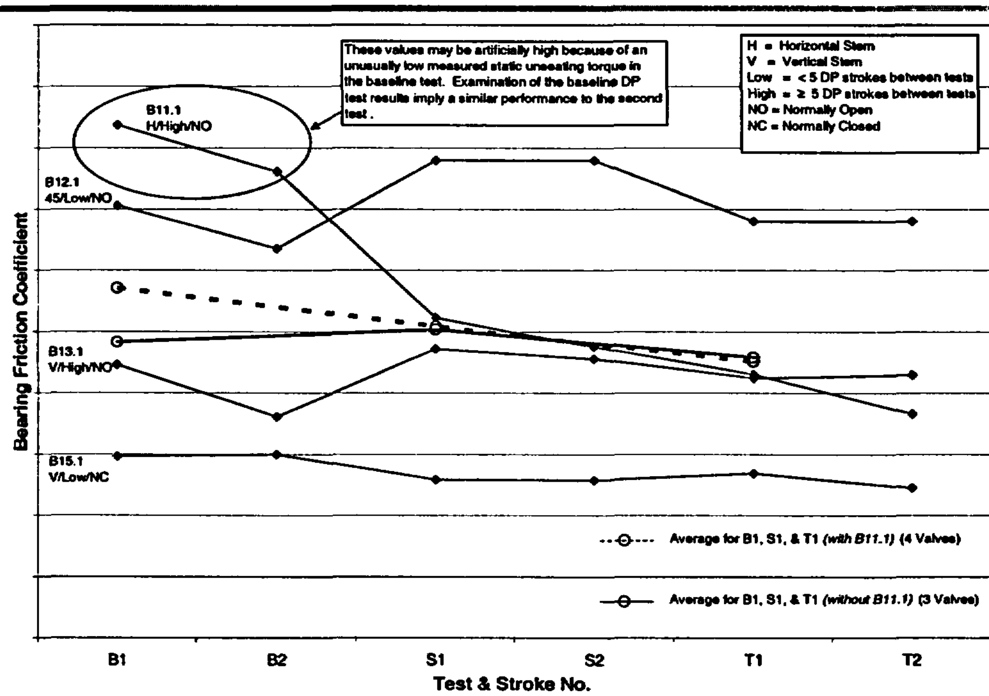
- **Step 1**: Valves evaluated using EPRI PPM → Class A
- **Step 2**: Each valve is evaluated to determine a JOG Configuration & Application Information (*CAI*) rating
  - Valves evaluated based on specific design configurations and in-service application conditions
    - Disk-to-body guide materials
    - Frequency of in-service DP stroking
    - Fluid type and temperature
  - Valves receive a CAI rating: *1*, *2* or *3*
- **Step 3**: Raw water valves classified as *Class B**
  - PV requirements for Class B apply
  - Valve must be evaluated for susceptibility to elevated thrust and appropriate action taken

JOG Program Results and Periodic Verification – Butterfly Valves

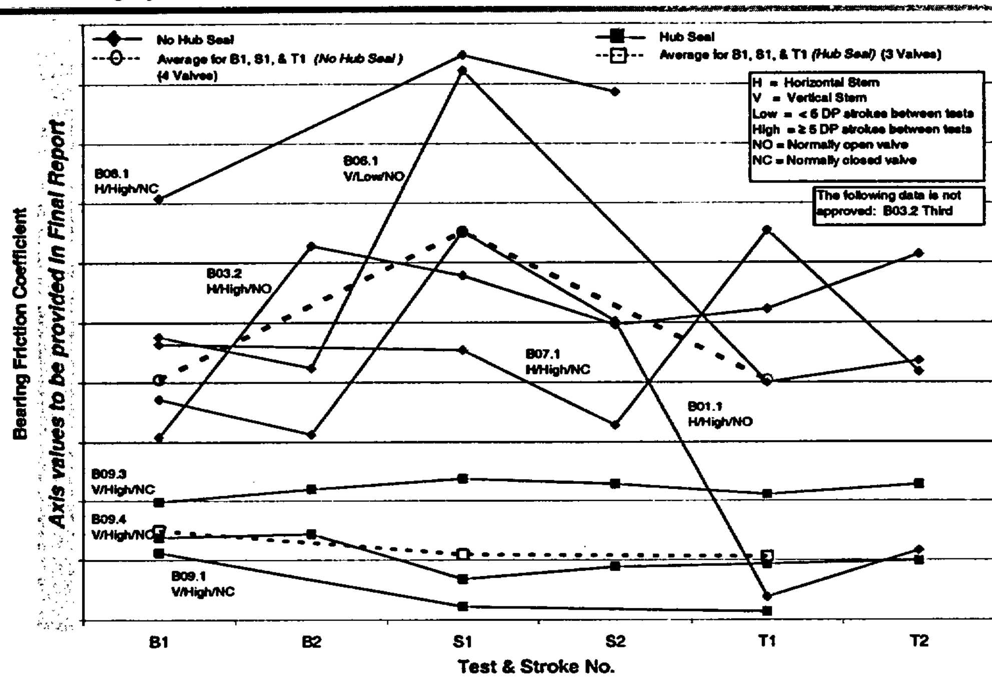
Butterfly Valve Test Results

- No service-related degradation in required bearing torque
- Bronze Bearings
  - ► Treated water systems: bearing COF is stable
  - ► Untreated water systems
    - – Valves with hub seals show stable bearing COF
    - – Valves without hub seals show significant variation in bearing COF unrelated to DP stroking - no trend
- Non-Metallic Bearings
  - ► Teflon, Tefzel, Nomex, Nylatron and Polyethylene bearings
  - ► Small variations in bearing COF; no trend
- No effect of stem orientation, DP stroking, normal position or shaft material

Butterfly Valves – Bronze Bearings in Treated Water



Butterfly Valves - Bronze Bearings in Untreated Water



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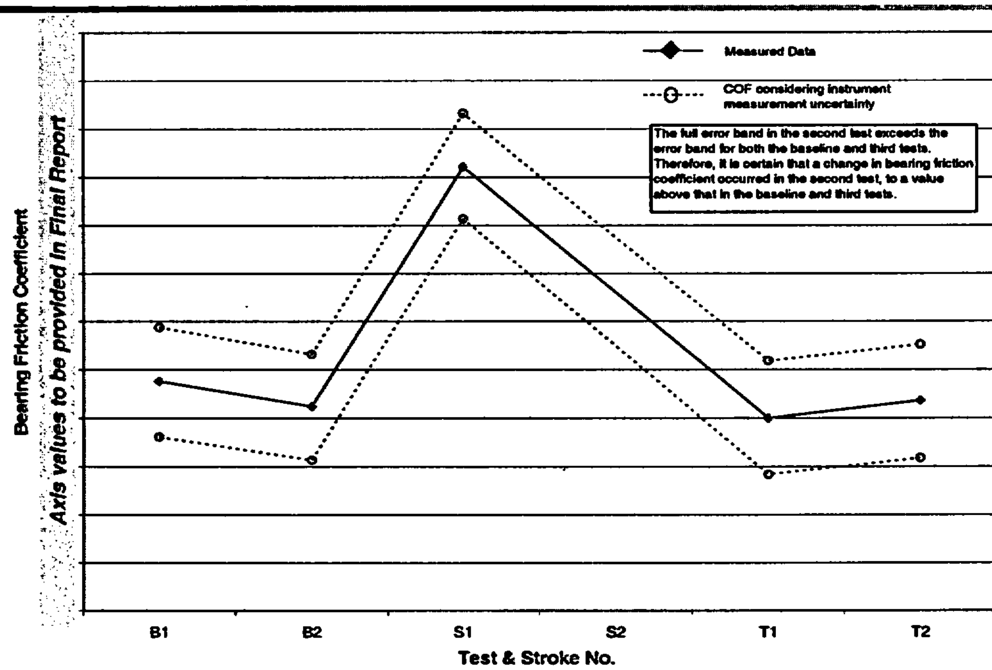
Evaluation of Measurement Uncertainty for B06.1



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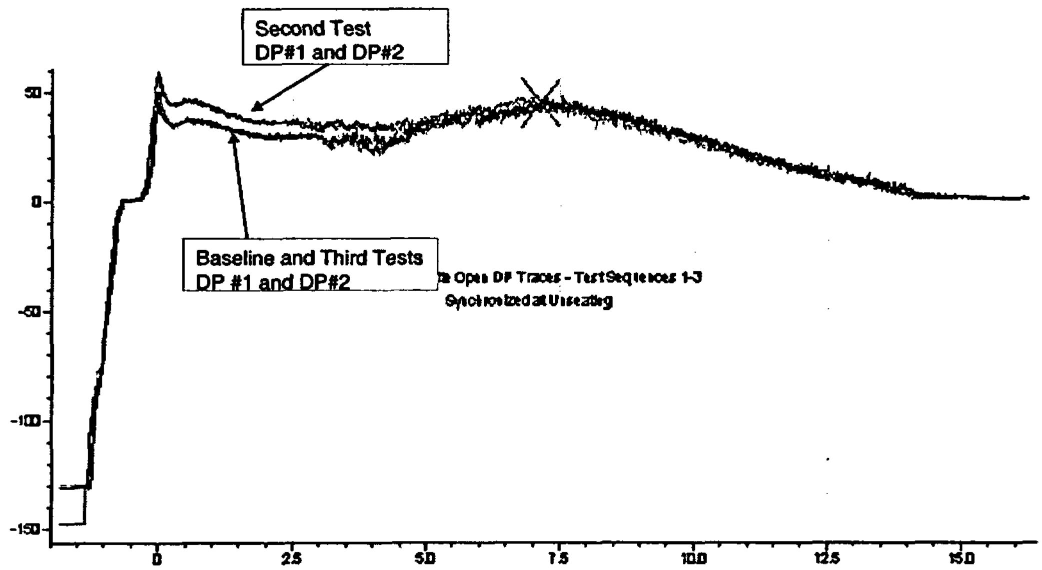
Torque Overlay for Opening Stroke of B06.1



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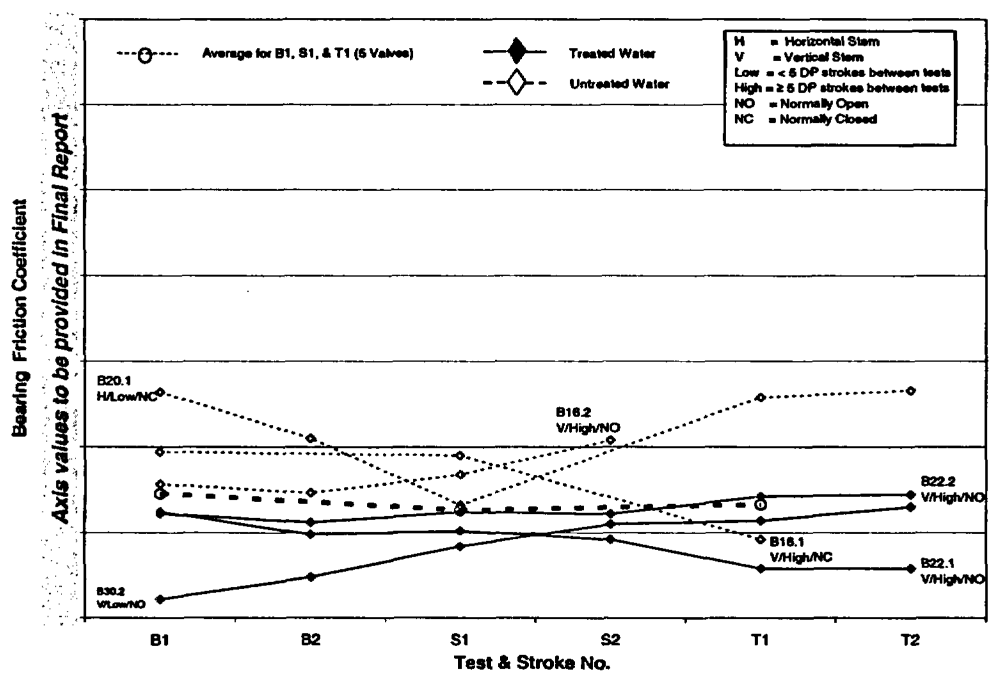
Butterfly Valves – Teflon Lined Bearings in Fiberglass Carriers



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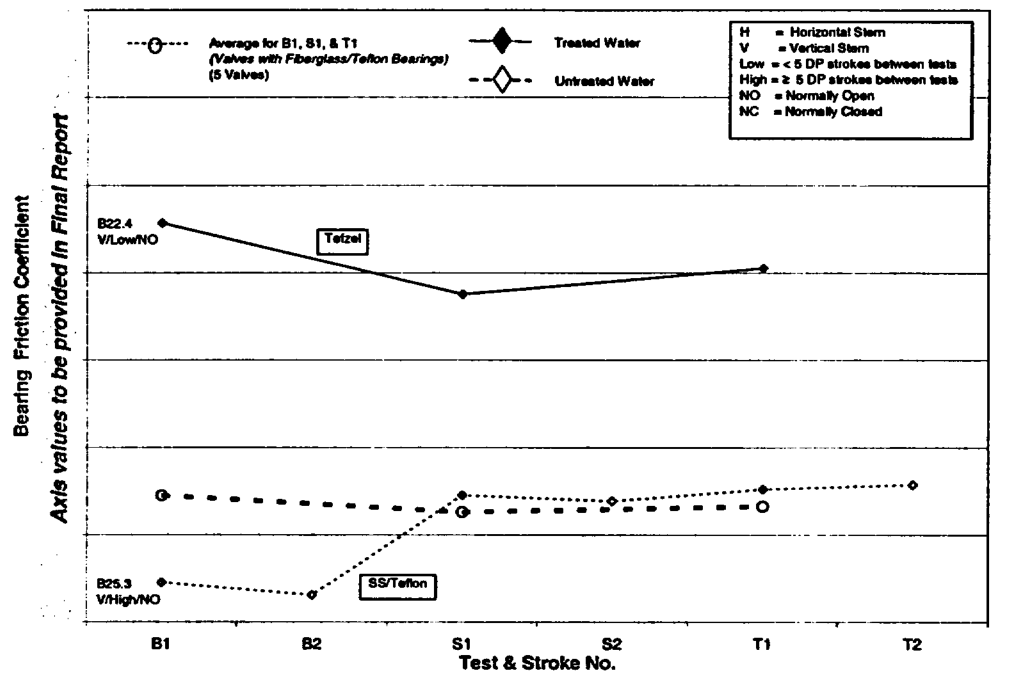
Butterfly Valves – Tefzel and Teflon Lined Bearings on SS Backing



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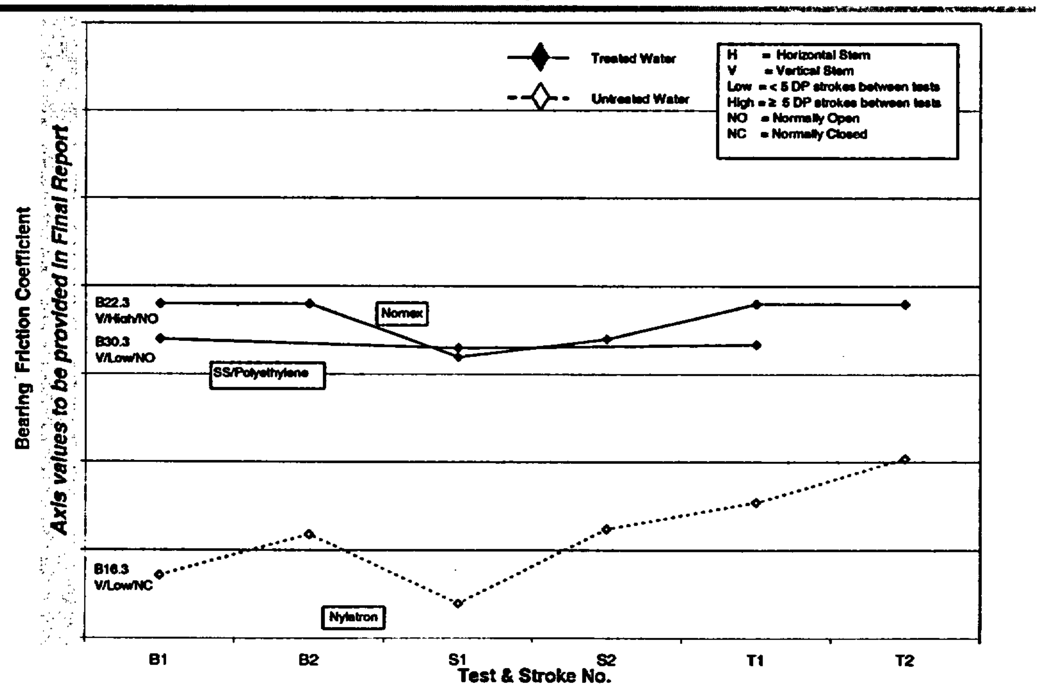
Butterfly Valves – Other Non-Metallic Bearings



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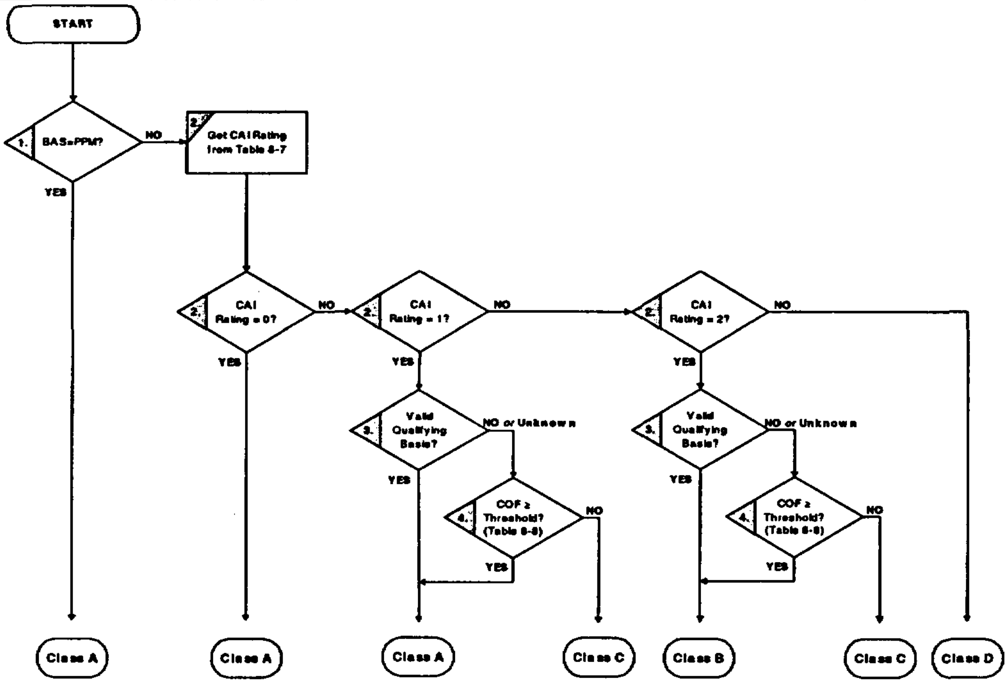
Method to Classify Butterfly Valves



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Method to Classify Butterfly Valves (cont'd)

- Step 1: Valves evaluated using EPRI PPM → Class A
- Step 2: Valve CAI rating determined (*0, 1, 2 or 3*)
  - Bearing material
  - Fluid type and temperature
  - Shaft material
  - Presence of a hub seal
- Step 3: "Qualifying Basis" of Bearing COF
  - ▸ If the bearing COF used for valve setup and margin meets Qualifying Basis, it is not susceptible to degradation
  - ▸ Use 1 of 3 criteria to meet Qualifying Basis
    - 1: Sufficient DP test data for the specific valve
    - 2: Sufficient DP test data for a group of valves
    - 3: Plant-specific method to demonstrate stable/bounding COF

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Method to Classify Butterfly Valves (cont'd)

- **Step 4**: COF Thresholds
  - ► Valves without a Qualifying Basis for setup COF must consider COF thresholds
    - Setup COF ≥ JOG threshold → Class A or B
    - Setup COF < JOG threshold → Class C
  - ► Thresholds represent maximum observed COF values from JOG testing

- **PV for Class C Valves**
  - ► Must consider COF allowances in determining margin
  - ► Allowances represent max COF increase from JOG testing for each valve group

JOG Program Results and Periodic Verification – Gate Valves

Gate Valve Test Results

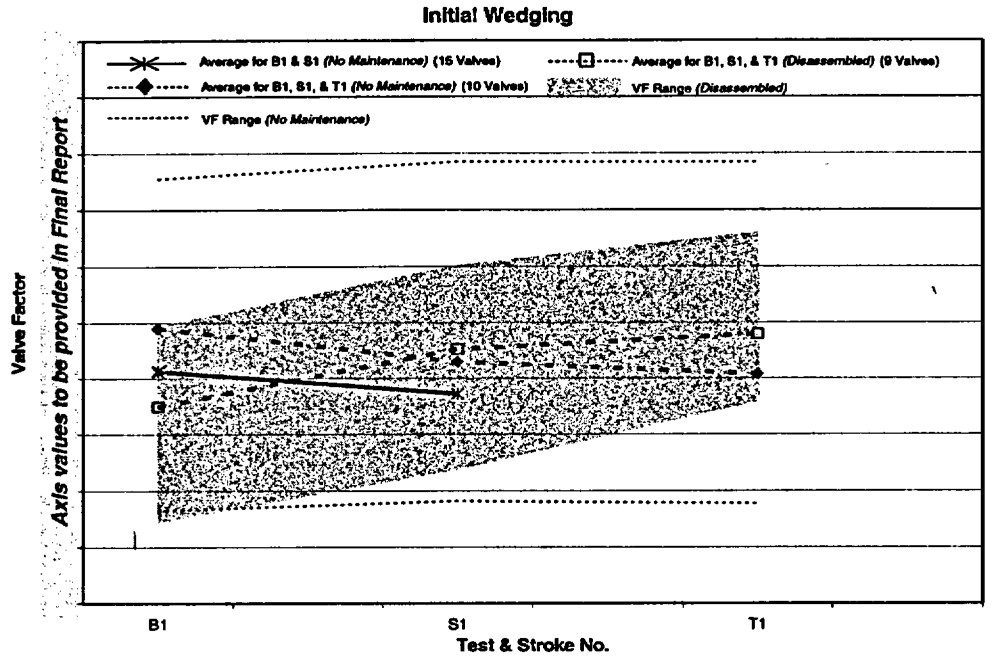
- No age-related degradation
  - ▸ No increase in required thrust or torque due only to the passage of time (without DP stroking)
- No service-related degradation (with DP stroking) in required thrust, except for certain conditions
  - ▸ Low initial valve factors due to disassembly or limited DP stroking in service are susceptible to increases with DP stroking, up to a stable level

Gate Valve Test Results (cont'd)

Disk-to-Seat Friction

- ▸ Controls most open strokes; essentially all closing strokes
- ▸ Disassembled/Reassembled valves show reduced VFs
  - tend to increase with DP stroking to values similar to non-disassembled valves (*service-related degradation*)
  - effect is stronger in water; weaker in steam
- ▸ Non-disassembled valves show range of VF
  - tend to remain stable with stroking
  - valves that DP stroke frequently tend to have higher VF in water systems and lower VF in steam
  - valves with low initial VFs that do not stroke against DP may increase if service conditions change to include DP stroking

Valve Factor at Initial Wedging – Stellite Seats/Cold Treated Water/Low DP Strokes



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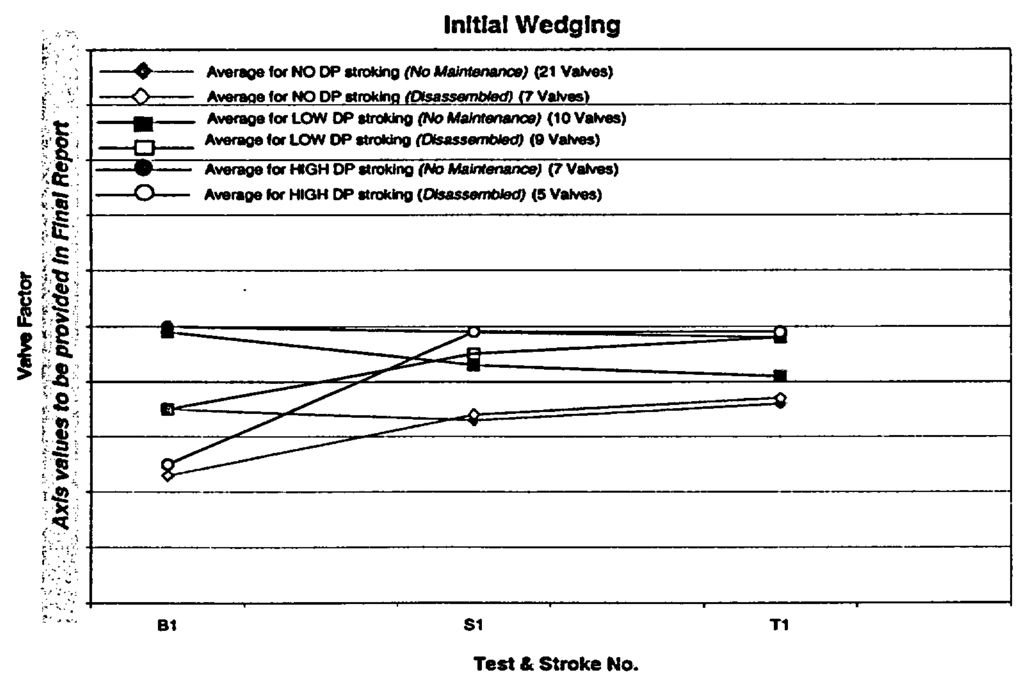
Average Valve Factors for Stellite Seats/Cold Treated Water – Influence of DP Stroking



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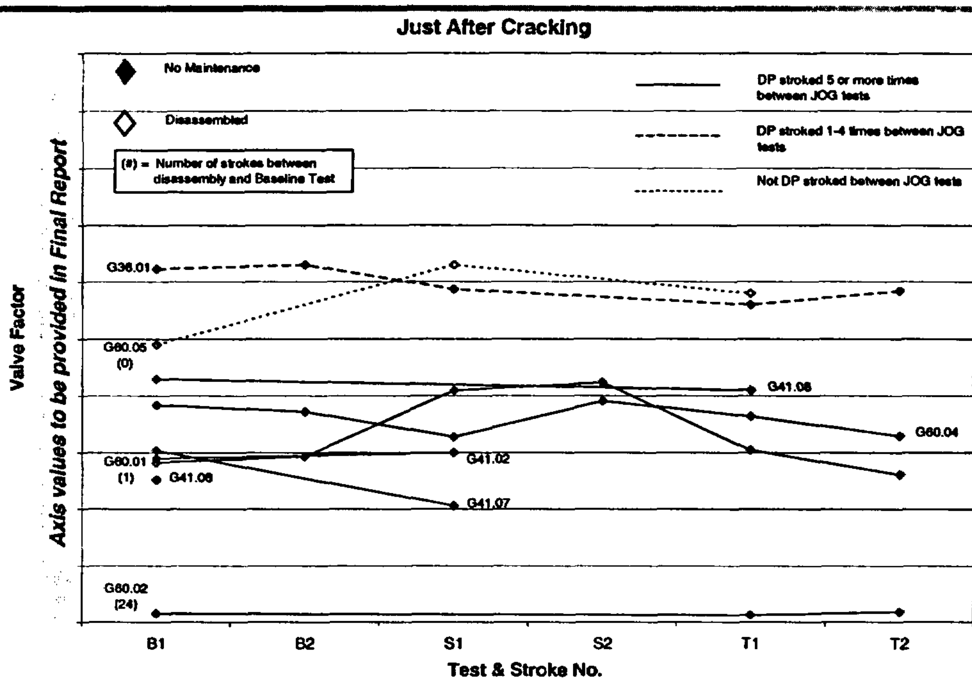
Opening Valve Factor at Just After Cracking – Stellite Seats / Steam



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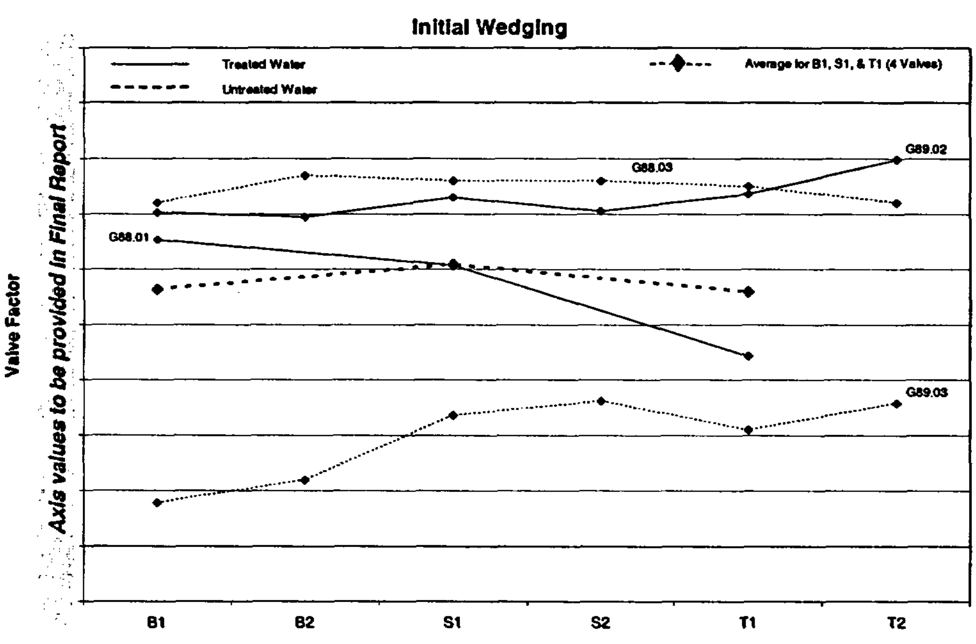
Valve Factor at Initial Wedging – Self-Mated 400 series Stainless Steel Seats



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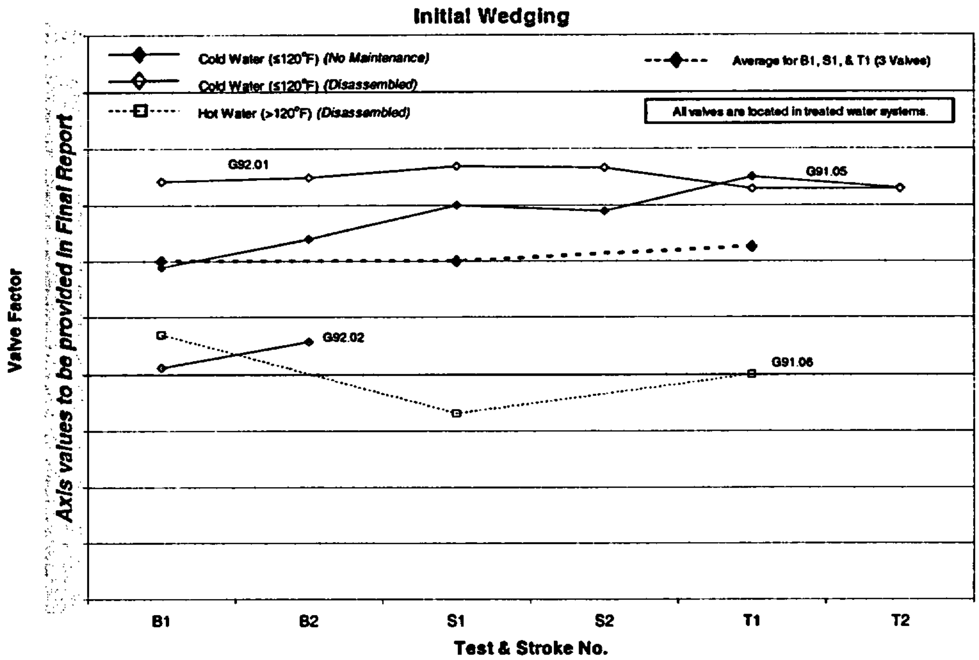
Valve Factor at Initial Wedging – 400 series Stainless Steel Disk vs. Stellite Seat Ring



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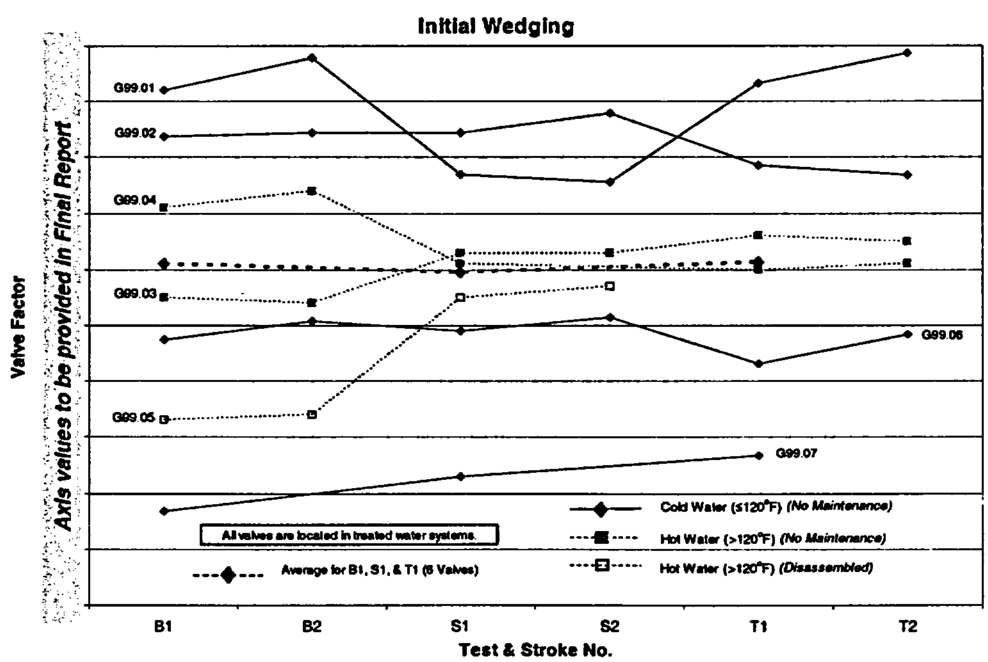
Valve Factor at Initial Wedging – 400 series SS (or Exelloy) Disk vs. Monel Seat Ring



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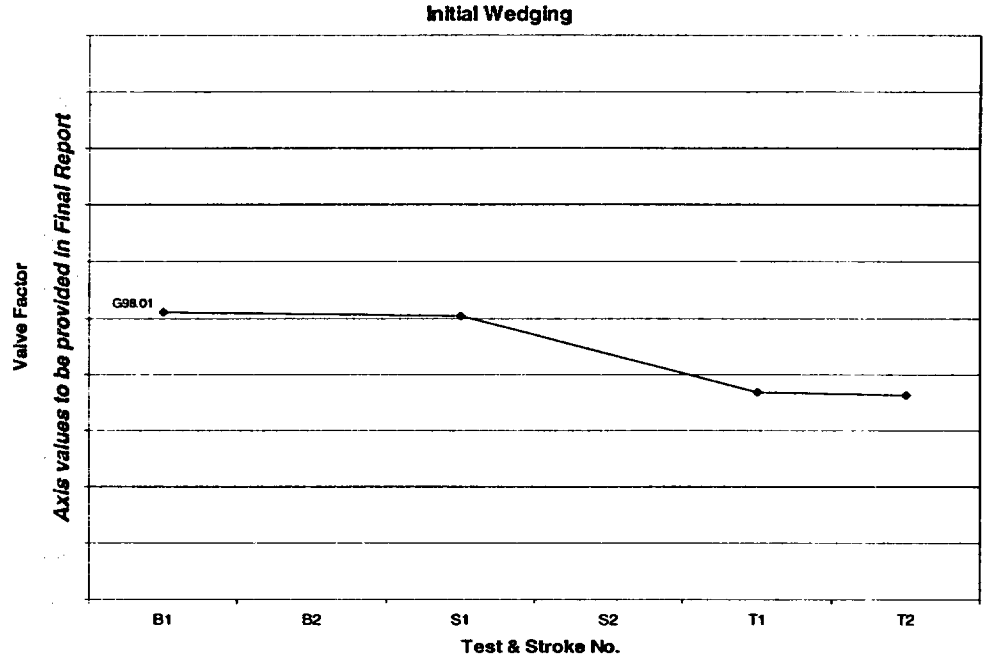
Valve Factor at Initial Wedging – Self-mated Deloro 50 Seats

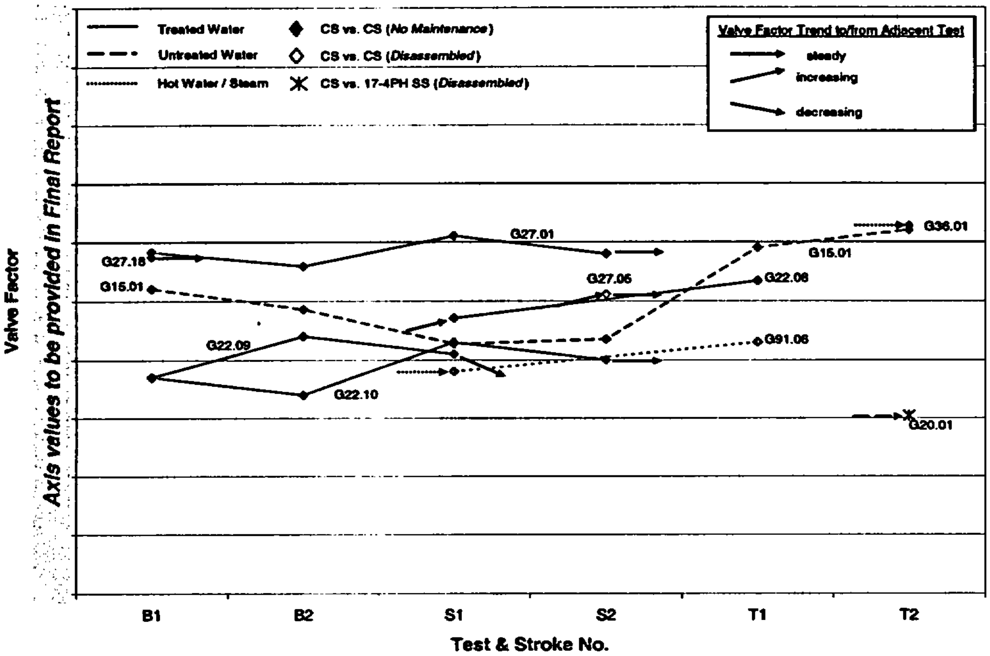


Gate Valve Test Results (cont'd)

Guide Friction

- Some open strokes controlled by guide friction
- Guides showed stable friction; limited cases of post-disassembly increases due to DP stroking are much less than those observed for seat friction
- No evidence of guide wear, corrosion or galling contributing to degradation
  - No data obtained for self-mated 300 SS guides that stroke at temperatures > 120°F; method to classify gate valves considers temperature for this material

Open Guide Valve Factors – Carbon Steel vs. Carbon Steel or 17-4 PH SS



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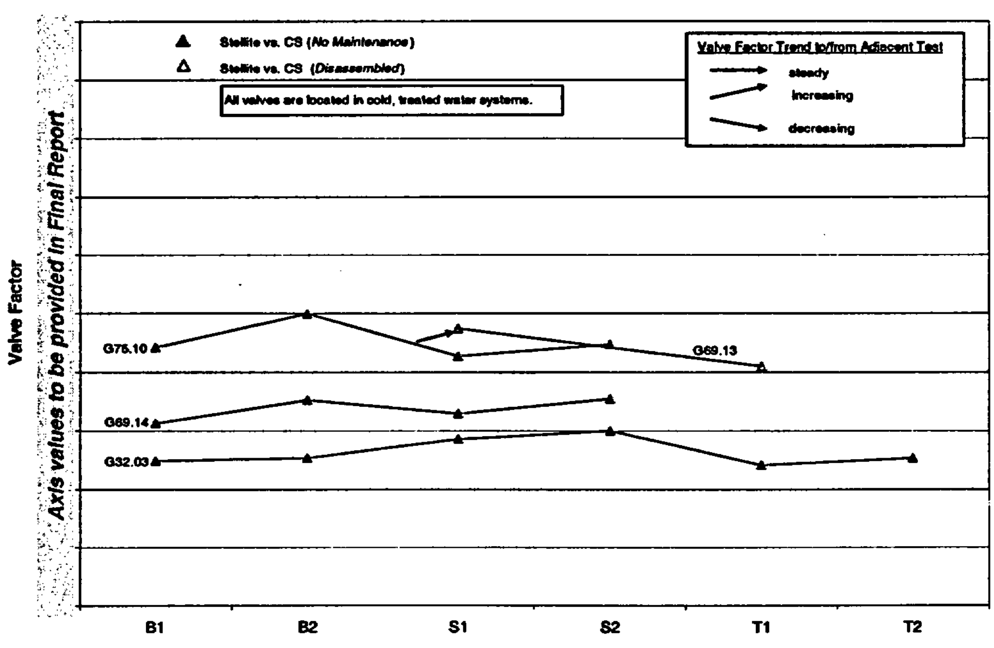
Open Guide Valve Factors – Stellite vs. Carbon Steel



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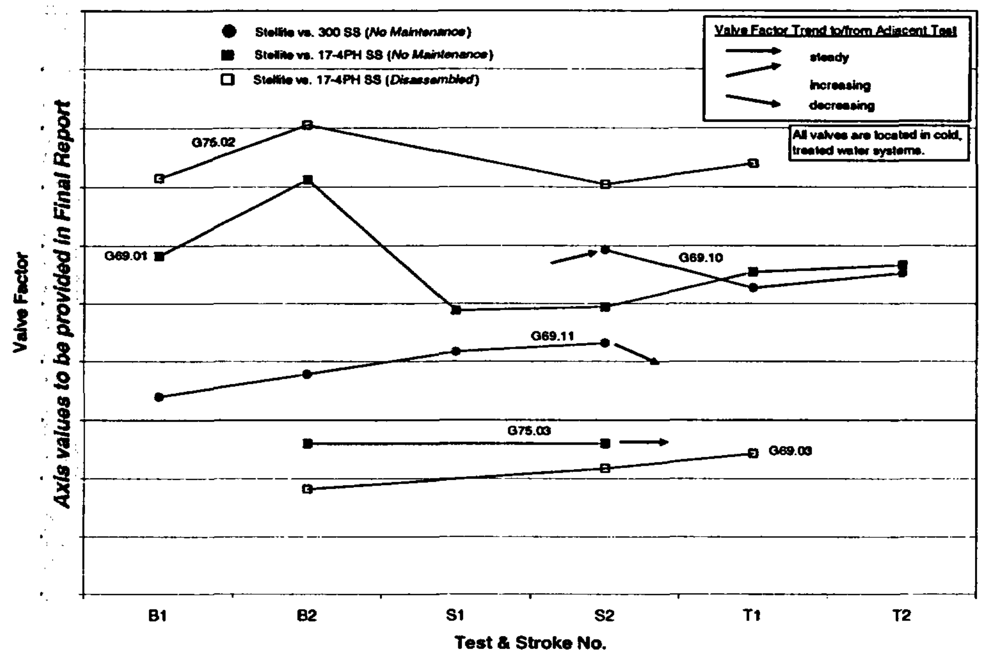
Open Guide Valve Factors –
Stellite vs. 300 series SS or 17-4 PH SS



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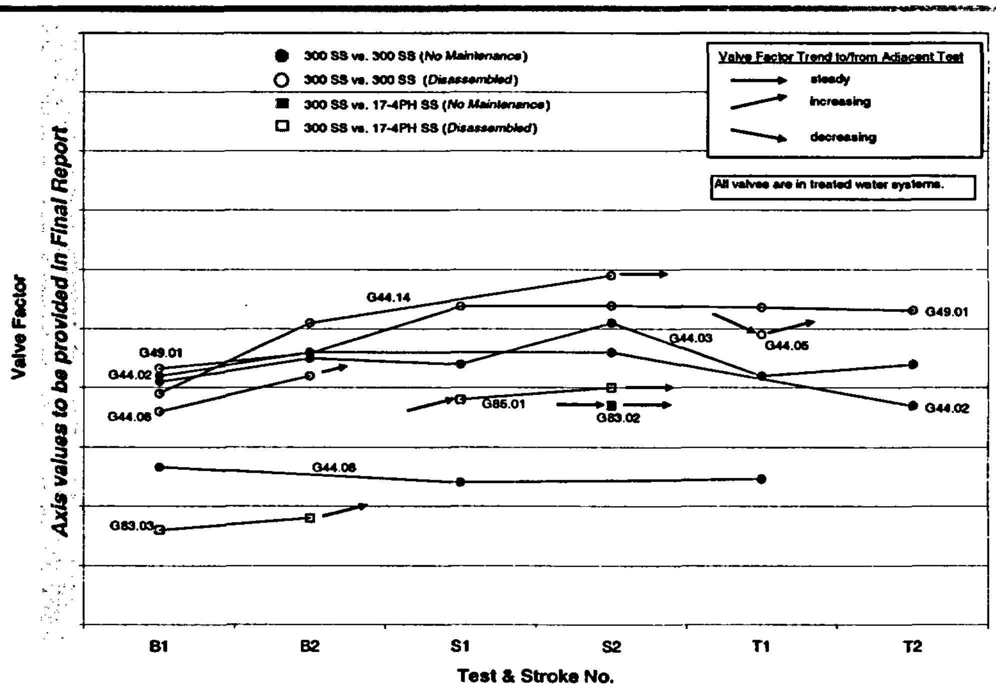
Open Guide Valve Factors –
300 series SS vs. 300 series SS or 17-4 PH SS



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Hard-Seating of A/D Double Disk & Aloyco Split Wedge Gate Valves

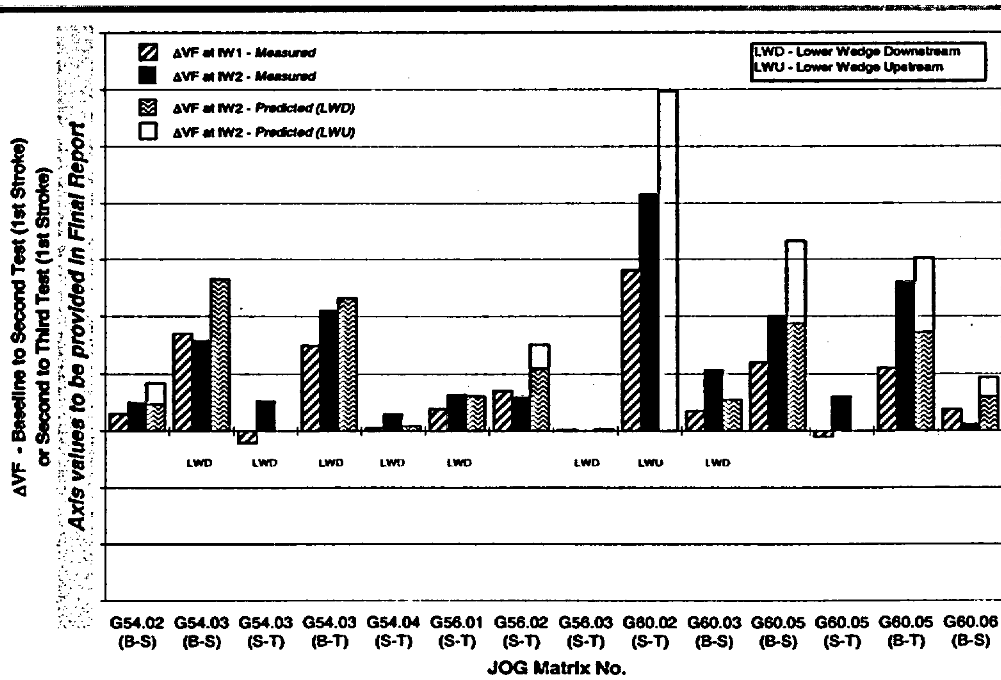
Double Disk

- No degradation associated with spreading of internal wedge assembly
- Changes in VF at hard seating (IW2) do not indicate degradation beyond that indicated by changes in seat friction (IW1)

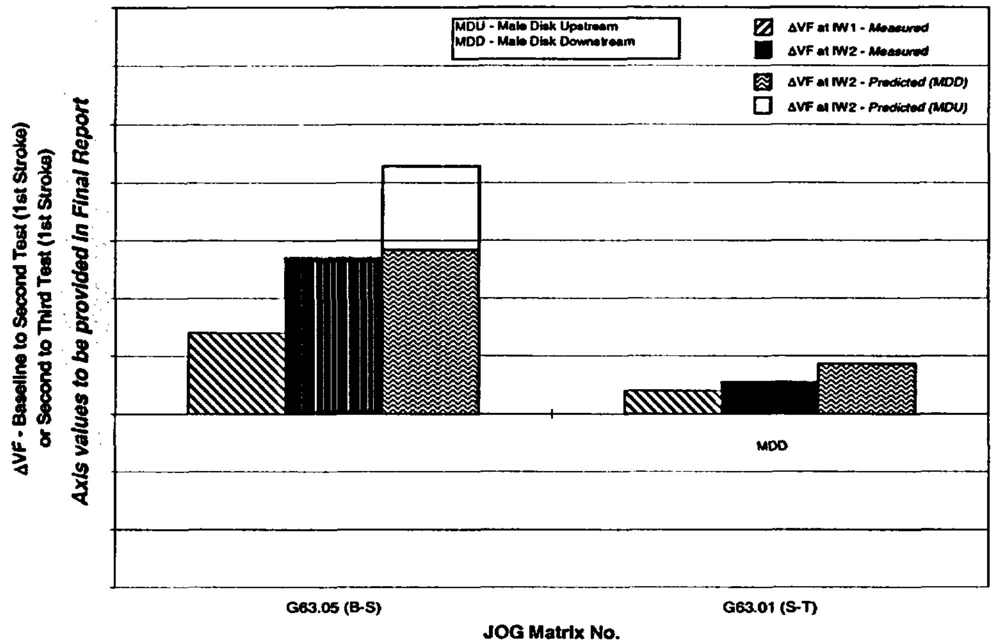
Split Wedge

- No degradation associated with ball/socket joint
- Changes in VF at hard seating (IW2) do not indicate degradation beyond that indicated by changes in seat friction (IW1)
- No data obtained for split wedge valves that stroke at temperatures > 120°F; method to classify gate valves considers temperature for this valve

ΔValve Factor – IW1 vs. IW2 Double Disk Gate Valves



ΔValve Factor – IW1 vs. IW2
Split Wedge Gate Valves



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Gate Valve Test Results (cont'd)

- Additional NRC-requested evaluations of gate valve test data addressed in JOG PV Final Report
  - ► Normal Valve Position
    - negligible effect on repeat DP test results
  - ► Static Testing Prior to DP Testing
    - negligible effect (*October 2002 presentation*)
  - ► Draining/Venting Prior to DP Testing
    - draining/venting piping may slightly reduce the valve factor
    - negligible effect; not necessary to consider in PV Program

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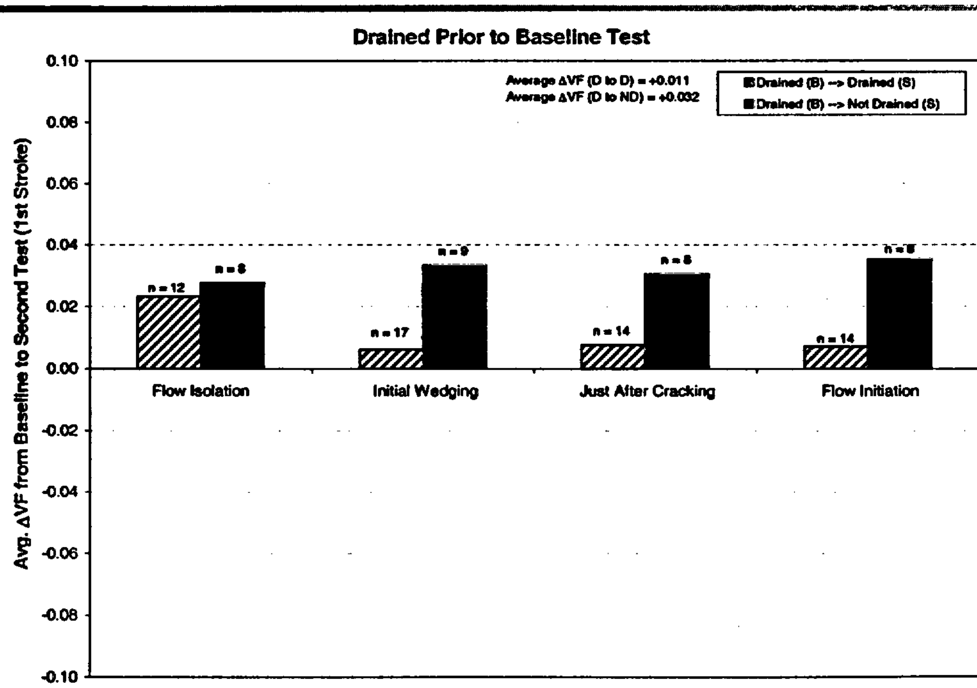
Effect of Draining/Venting

- Tests identified where piping surrounding valve was drained, vented and refilled prior to JOG DP test
- 89 non-disassembled gate valves evaluated for effect of ΔVF from baseline to second test – *4 cases*
  - Case 1: 18 valves d/v prior to baseline *and* second tests
  - Case 2: 9 valves d/v prior to baseline but *not* prior to second test
  - Case 3: 5 valves d/v prior to second but *not* prior to baseline test
  - Case 4: 57 valves not drained/vented prior to either test

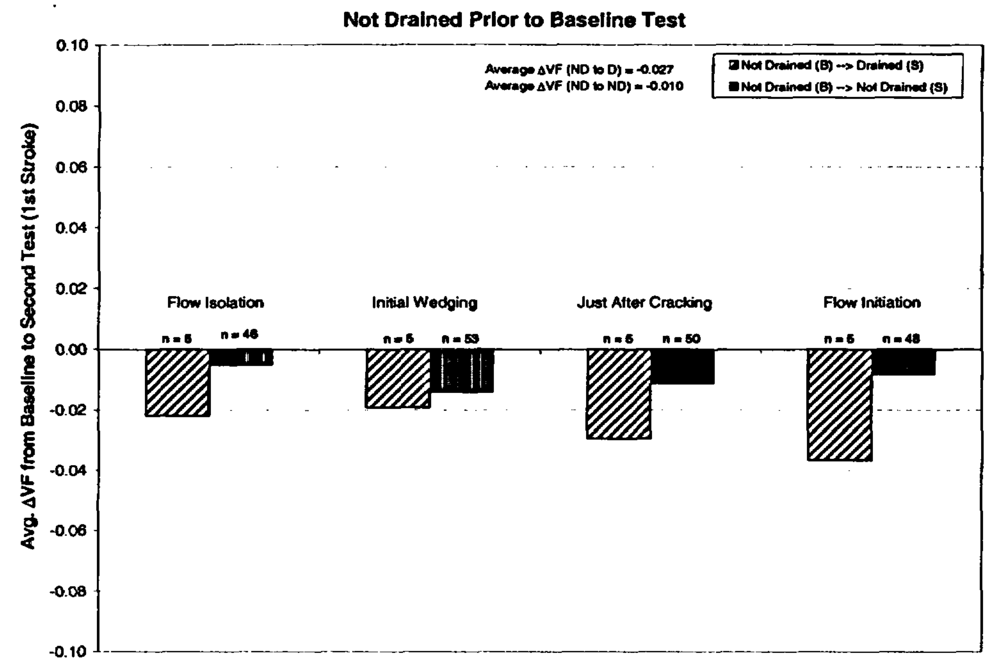
MPR

Effect of Draining/Venting (cont'd)



MPR

Effect of Draining/Venting (cont'd)



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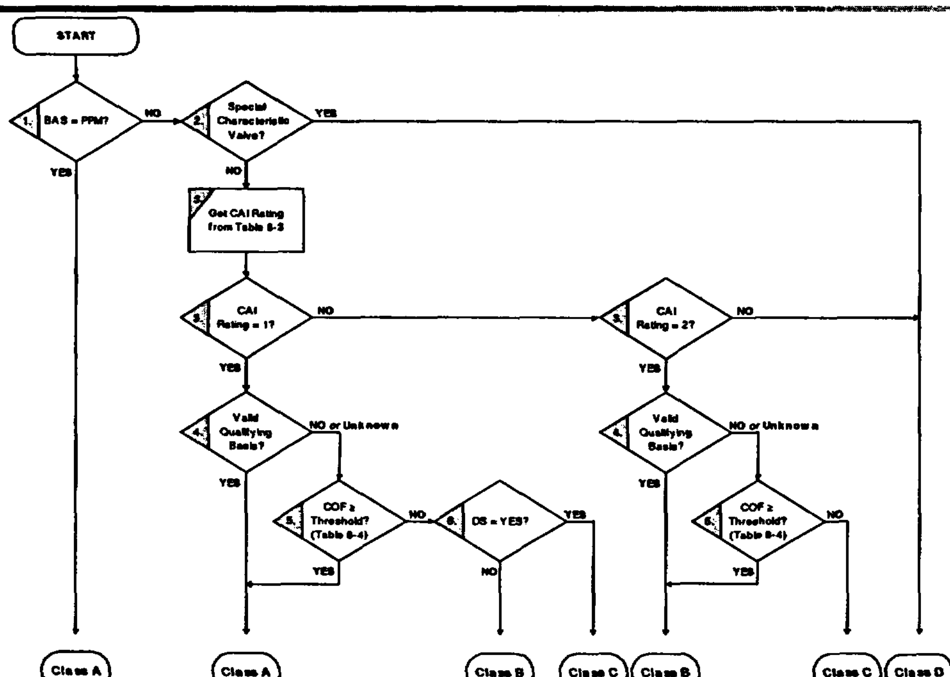
Method to Classify Gate Valves



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Method to Classify Gate Valves (cont'd)

- **Step 1**: EPRI PPM *or* EPRI TUM → Class A
- **Step 2**: Screen for special characteristics not covered by JOG testing → Class D
  - Aloyco split wedge valves required to hard seat in the closing direction that DP stroke in-service at temperatures >120°F
  - Solid/Flex wedge valves with self-mated 300 SS guides that DP stroke in-service at temperatures >120°F
- **Step 3**: CAI Rating (*1, 2 or 3*)
  - valve type
  - DP stroking frequency
  - disk-to-seat materials
  - fluid type and temperature
  - design basis function
  - disk-to-body guide materials

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Method to Classify Gate Valves (cont'd)

- **Step 4**: "Qualifying Basis" of Required Thrust
  - ► If the required thrust used for valve setup and margin meets Qualifying Basis, it is not susceptible to degradation
  - ► Use 1 of 2 criteria to meet Qualifying Basis
    - 1: Sufficient DP test data for the specific valve
    - 2: Sufficient DP test data for a group of valves

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Method to Classify Gate Valves (cont'd)

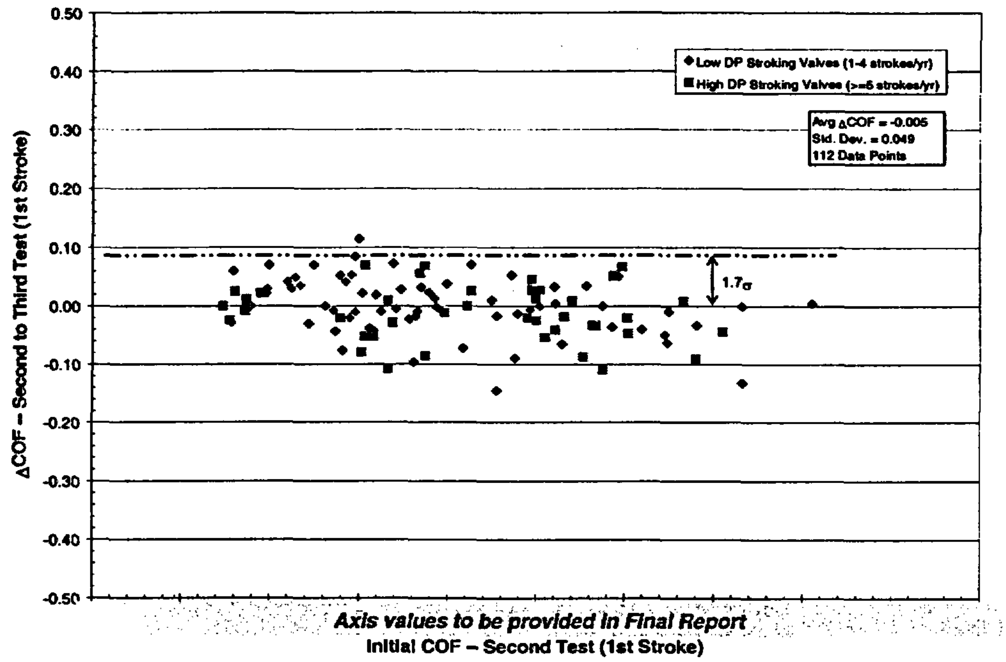
- **Step 5**: COF Thresholds
  - ▶ Valves without a valid qualifying basis for required thrust must consider COF thresholds to determine if valve is susceptible to thrust increases
    - Setup COF ≥ JOG threshold → Class A *or* Class B
    - Setup COF < JOG threshold → Class B *or* Class C
  - ▶ Thresholds determined from ΔVF vs. VF analysis
  - ▶ Thresholds based on:
    - Disk-to-seat materials
    - Fluid type and temperature
    - Frequency of DP stroking

Method to Classify Gate Valves (cont'd)

COF Threshold Analysis

- ▶ Valves with stable COF have minor observed differences associated with:
  - Measurement uncertainty
  - Random differences in disk-to-seat friction
- ▶ Stable valves analyzed to characterize population
  - non-disassembled
  - Stellite seats
  - water systems
  - routinely DP stroked
- ▶ Results
  - Mean ΔCOF ≈ 0
  - Standard deviation (σ) = 0.049
  - 95%/95% limit (based on population size) = 1.7 * σ = 0.08

ΔCOF vs. COF for Valves with Stable Behavior

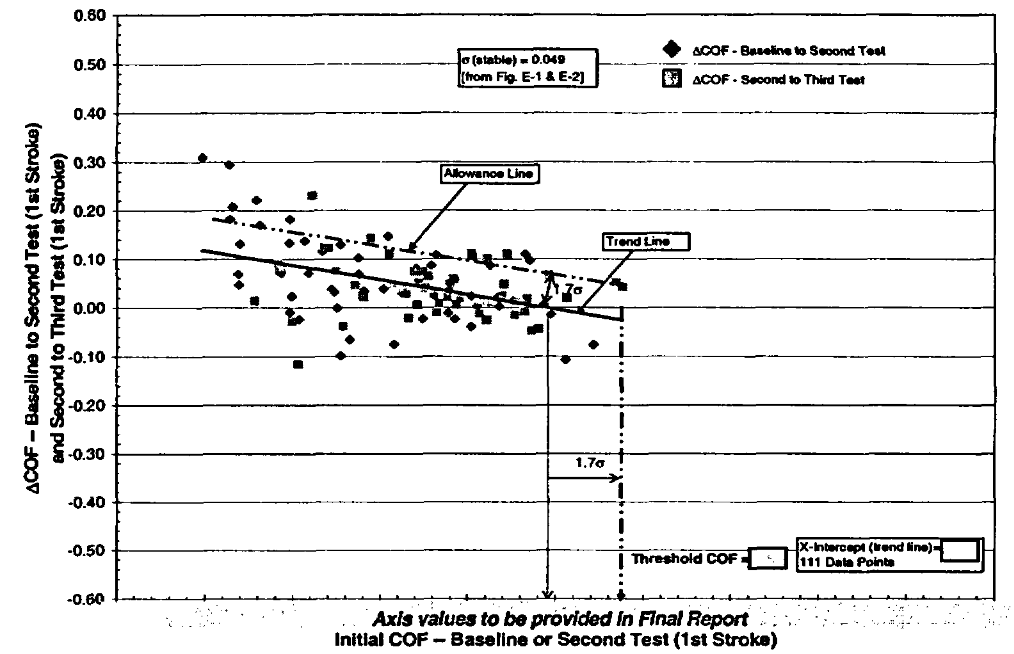


Method to Classify Gate Valves (cont'd)

<u>COF Threshold Analysis (cont'd)</u>

- Valves susceptible to service-related degradation analyzed (ΔCOF vs. COF)
  - Valves disassembled in 2 years prior to JOG testing
  - Non-disassembled valves with low initial COFs that increased during testing (>10% considering uncertainty)
- Results
  - Linear regression line shows trend of data
  - Random differences consistent with stable valves
  - x-intercept of trend line shows *<u>nominal</u>* threshold value
  - 95%/95% threshold = x-intercept + 0.08

ΔCOF vs. COF for Valves with Systematic Changes



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Method to Classify Gate Valves (cont'd)

COF Threshold Analysis (cont'd)

<table>
<tr><th colspan="3">Category</th><th rowspan="2">Threshold COF</th></tr>
<tr><th>Disk-to-Seat Materials</th><th>Fluid Type & Temperature</th><th>Extent of DP Stroking</th></tr>
<tr><td rowspan="4">Self-mated Stellite</td><td rowspan="3">Water or Air/N_2
All temperatures</td><td>No DP stroking</td><td rowspan="8">Values to be provided in Final Report</td></tr>
<tr><td>Low DP stroking (1-4 strokes/year)</td></tr>
<tr><td>High DP Stroking (≥5 strokes/year)</td></tr>
<tr><td>Steam</td><td>All</td></tr>
<tr><td>400 series Stainless Steel vs. Stellite</td><td>Water or Air/N_2
All temperatures</td><td>All</td></tr>
<tr><td>Self-mated 400 series Stainless Steel</td><td>Water or Air/N_2
≤ 120°F</td><td>All</td></tr>
<tr><td>400 series Stainless Steel (or Exelloy) vs. Monel</td><td>Water or Air/N_2
All temperatures</td><td>All</td></tr>
<tr><td>Self-mated Deloro50</td><td>Treated Water
≤ 120°F</td><td>All</td></tr>
<tr><td colspan="3"></td><td>Use values for Stellite valves</td></tr>
</table>

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Method to Classify Gate Valves (cont'd)

- **<u>Step 6</u>**: DP Stroking Screen
  - ▸ Valves without a Qualifying Basis or with COF < JOG Thresholds are evaluated for DP stroking
    - – Valves that <u>do not</u> stroke against DP → Class B
    - – Valves that <u>do</u> stroke against DP → Class C

- **<u>PV for Class C Valves</u>**
  - ▸ Must consider COF allowances in determining margin
  - ▸ Allowance provides incremental increase in COF (added for each 2-year period) based on starting COF
  - ▸ Increments COF up to threshold value
  - ▸ Determined from ΔVF vs. VF analysis

Method to Classify Gate Valves (cont'd)

COF Allowances for Class C Gate Valves

Category			Allowance (ΔCOF) for 2-year period
Disk-to-Seat Materials	**Fluid Type & Temperature**	**Extent of DP Stroking**	
Self-mated Stellite	Water or Air/N_2 All temperatures	Low DP stroking (1-4 strokes/year)	Values to be provided in Final Report
Self-mated Stellite	Water or Air/N_2 All temperatures	High DP Stroking (≥5 strokes/year)	Values to be provided in Final Report
Self-mated Stellite	Steam	All	Values to be provided in Final Report
400 series Stainless Steel vs. Stellite	Water or Air/N_2 All temperatures	All	Values to be provided in Final Report
Self-mated 400 series Stainless Steel	Water or Air/N_2 ≤ 120°F	All	Values to be provided in Final Report
400 series Stainless Steel (or Exelloy) vs. Monel	Water or Air/N_2 All temperatures	All	Values to be provided in Final Report
Self-mated Deloro50	Treated Water ≤ 120°F	All	Values to be provided in Final Report

JOG PV Final Report Submittal

JOG PV Final Report

JOG will issue a new Topical Report to document the program conclusions and implementation approach for GL 96-05 MOV Periodic Verification

- MPR-2524, "Joint Owners' Group (JOG) Motor Operated Valve Periodic Verification Program Summary"
- Incorporates SER issued on original Topical Report, as requested by NRC
- Incorporates the content of all Feedback Notices; current FNs will be superseded by the new Topical Report

Format of JOG Topical Report

- Executive Summary
- Section 1: Introduction
- Section 2: JOG PV Program Description
- Section 3: Test Program Results for Gate Valves
- Section 4: Test Program Results for Butterfly Valves
- Section 5: Test Program Results for Balanced Disk Globe Valves
- Section 6: Test Program Results for Unbalanced Disk Globe Valves
- Section 7: Implementation of JOG PV Approach
- Section 8: References
- Appendices A thru H

JOG PV Final Report Schedule

2003	*August 21*	Draft of JOG report issued to participating utilities for industry review
	October 1-2	JOG/NRC meeting to discuss program conclusions and draft report
	October 10	Industry comments due
	November 17-20	JOG Core Group meeting to disposition industry comments
	January	Revision 0 of JOG Final Report issued to Owners Groups for approval
2004	*February*	Revision 0 of JOG Final Report submitted to NRC
	August	Anticipated SER

JOG Topical Report Submittal Logistics

- Owners' Groups will submit one JOG PV Topical Report (MPR-2524) to NRC for review

- Individual OGs will submit request for review under their docket numbers

- JOG plans to request waiver on NRC Review Fees

- JOG Topical Report may be classified Proprietary