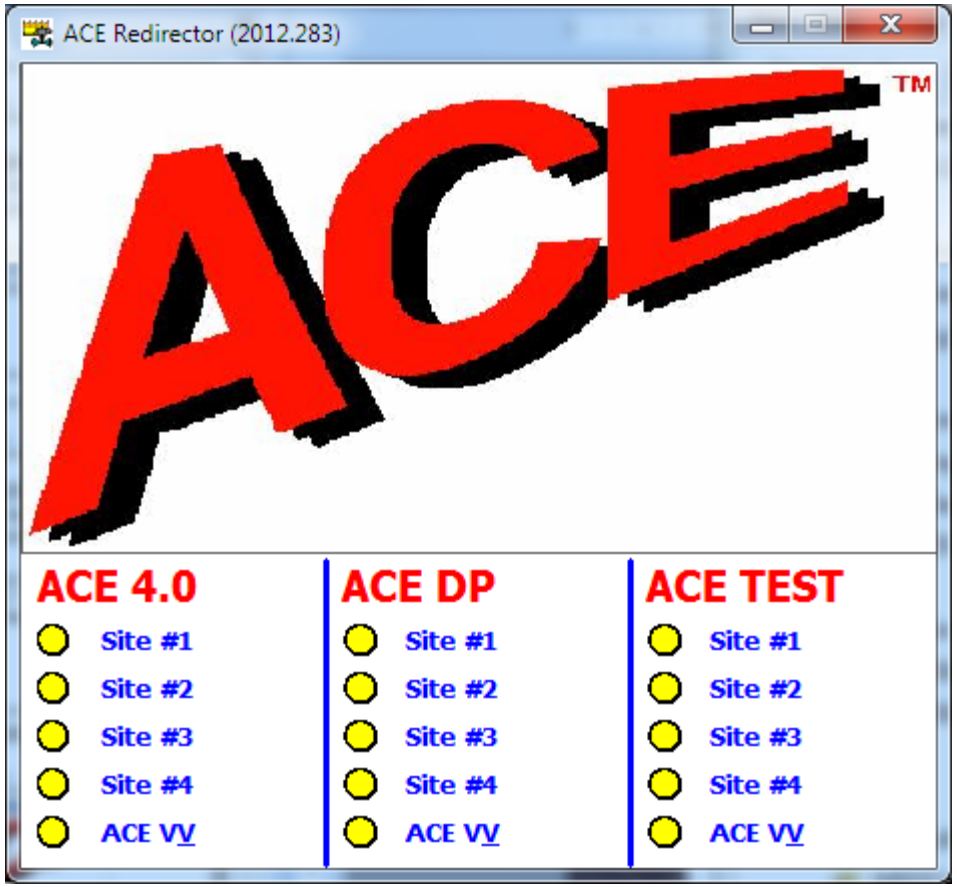
TELEDYNE TEST SERVICES
Everywhereyoulook™
Valve Diagnostic Testing and Maintenance

# QUIKLOOK USER GROUP
# QUG 7 Meeting
## August 14 & 15th, 2013


Presented by: **Eric Solla**

TELEDYNE TEST SERVICES
Everywhereyoulook™
Valve Diagnostic Testing and Maintenance

# ACE Test Software



TELEDYNE TEST SERVICES
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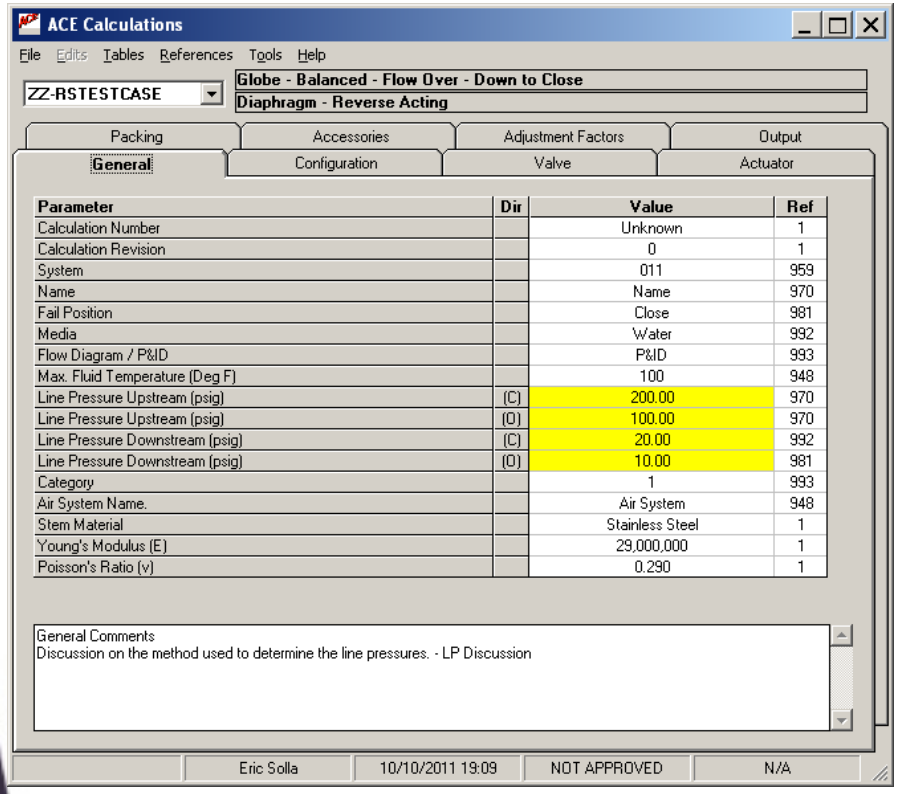
Valve Diagnostic Testing and Maintenance

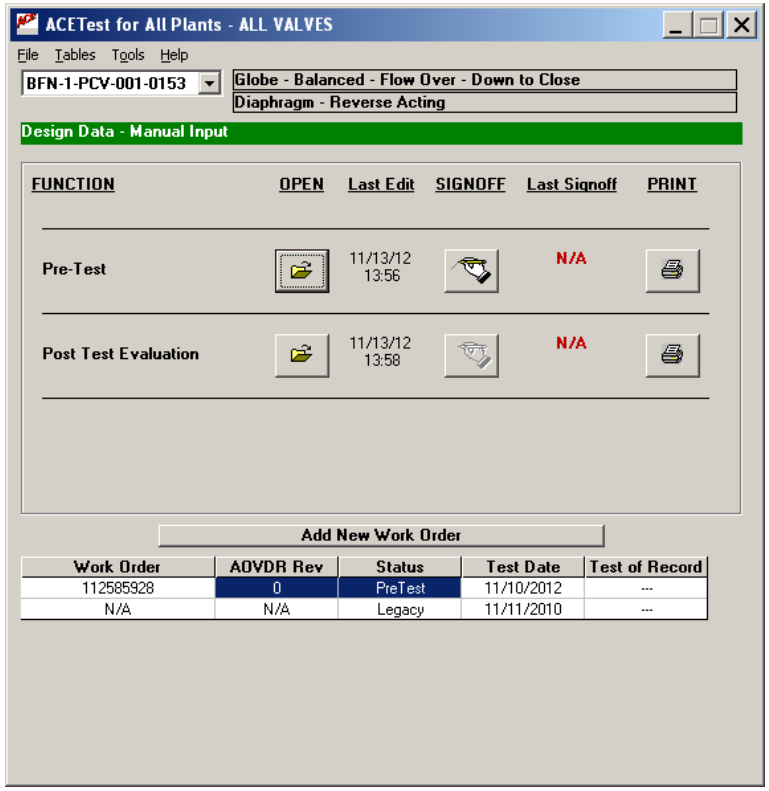
# AOV Software

## Integrated

### Design Calculation Software
### ACE




### Test Analysis Software
### ACETEST

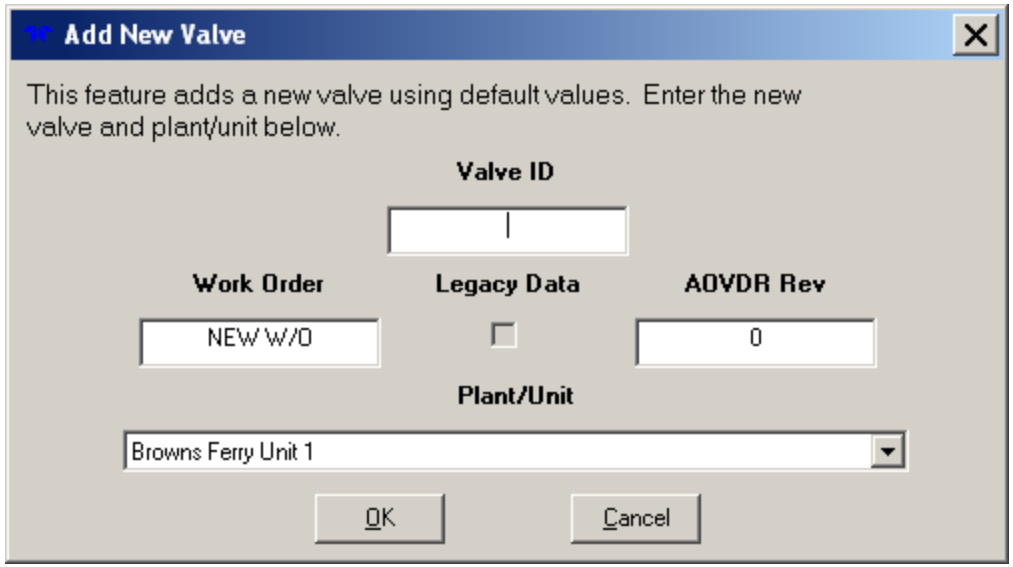


# ACETest Software History

- 2008 – ACETest Rev 0
  - Initial Release for Entergy – Indian Point
- 2008 – ACETest Rev 1
  - Minor rev
- 2009 – ACETest Rev 2
  - Major changes for Entergy Corporate Use
- 2010 – ACETest Rev 3
  - Renamed Software to ACETest
- 2012 – ACETest Rev 4
  - Updated to Interface with ACE 4.0
- 2013 – ACETest Rev 4.1
  - Total rewrite of software

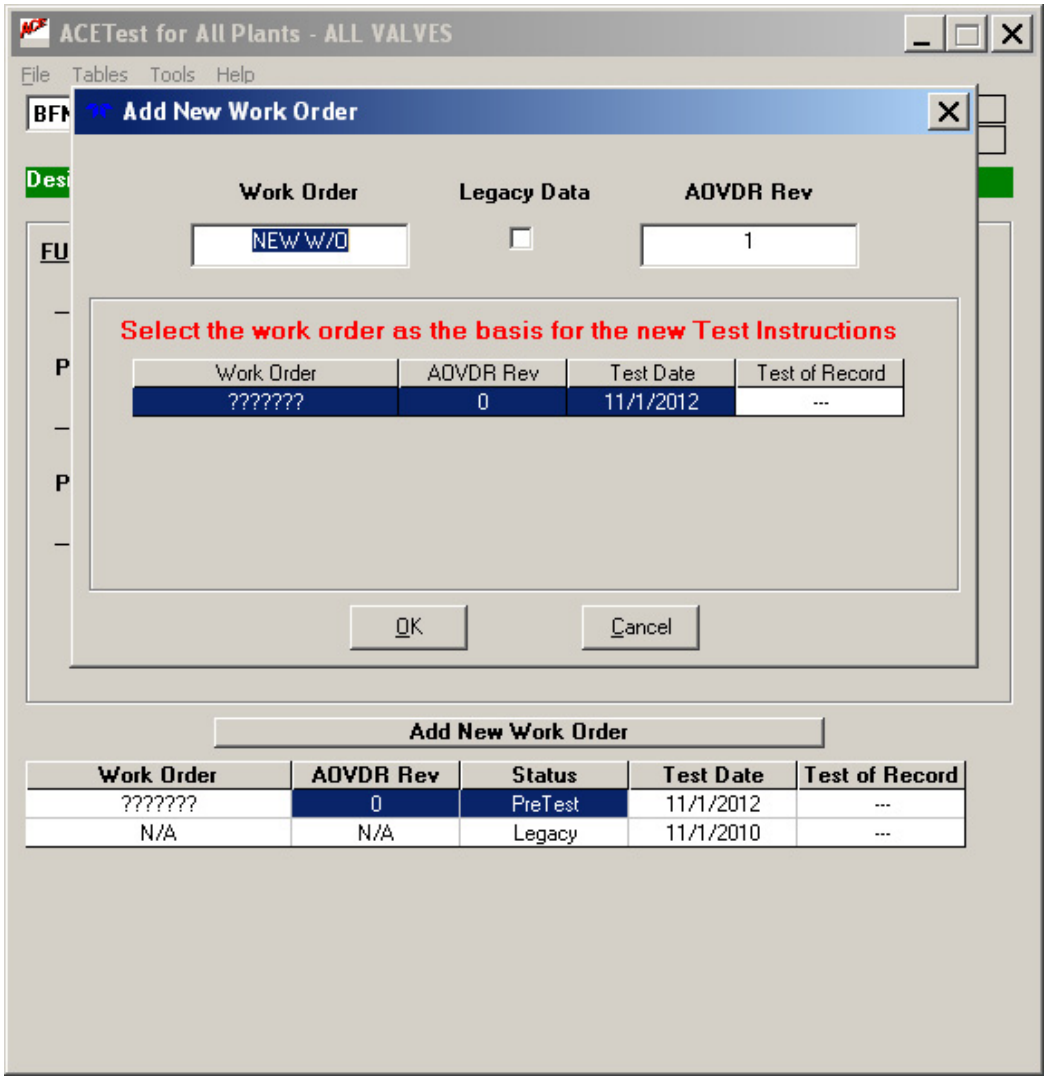
# ACETest Basics

- Add Valve (Manual)
  - Valve ID
  - WO
  - AOVDR Rev
  - Plant / Unit
  - Legacy Data



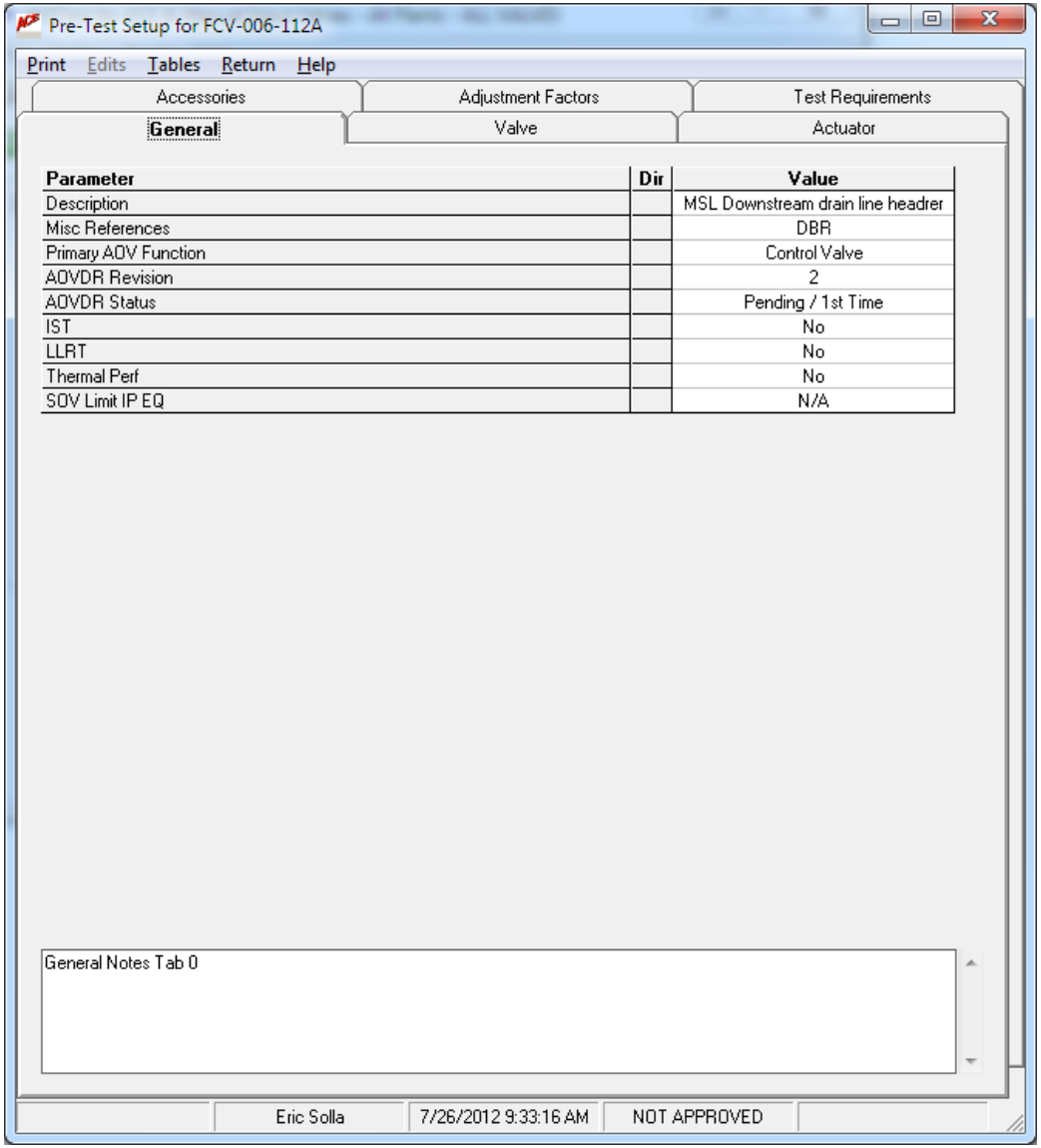
# ACETest Basics

- Add WO
  - WO
  - AOVDR Rev
  - Legacy Data
  - Select WO to Copy
  - Legacy WO Excluded



# ACETest Basics

- **Pre-Test Inputs**
  - **Similar layout to ACE**



# ACETest Basics

- **Design Inputs**
  - **Imported from ACE**

Design Data for RS-007-GL-B-O - Work Order 2013-0123

Print Return

Update Design Data

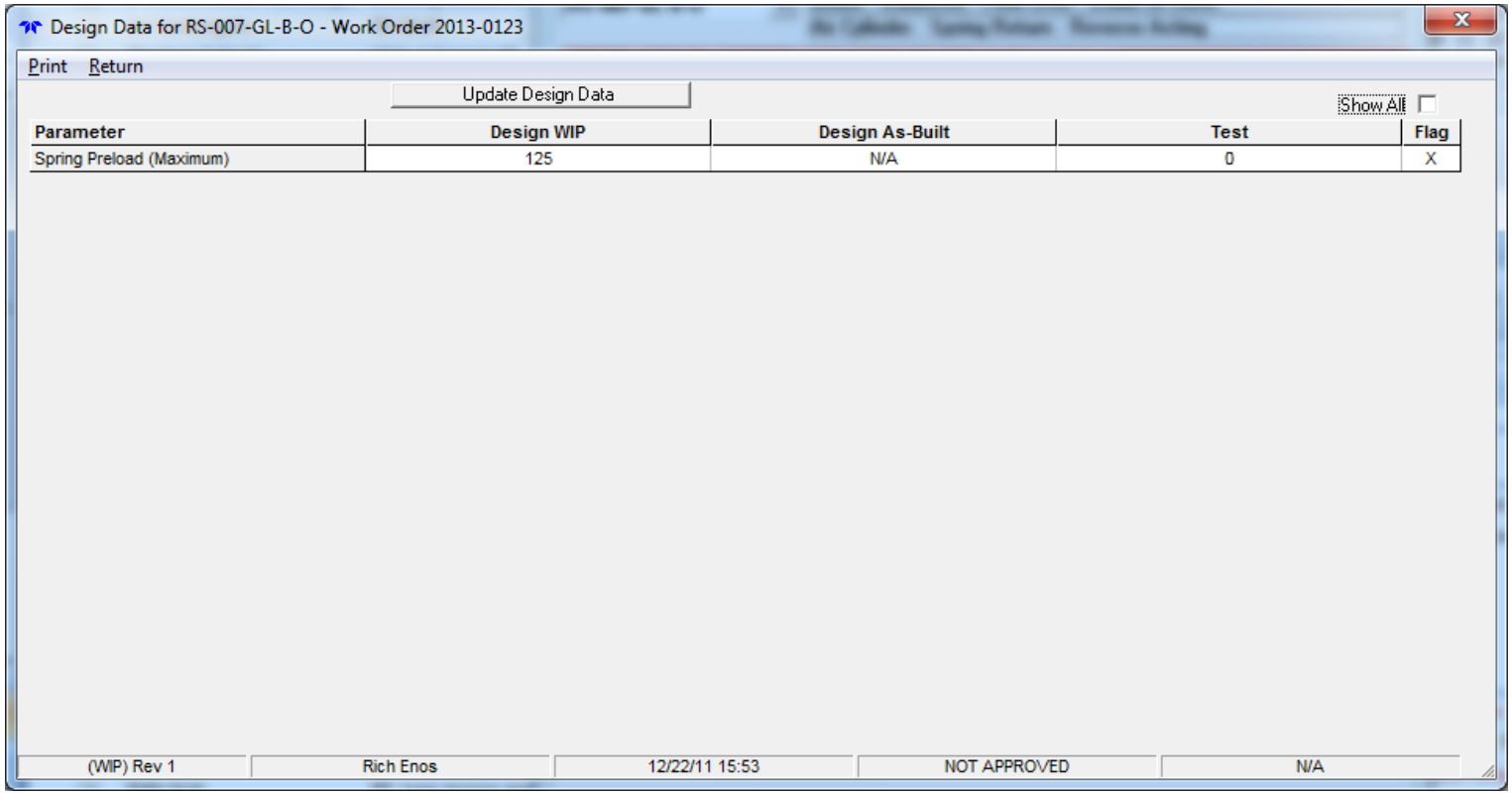
Show All

| Parameter | Design WIP | Design As-Built | Test | Flag |
|---|---|---|---|---|
| System | FW | N/A | FW | |
| Description | Test Valve | N/A | Test Valve | |
| Fail Position | Close | N/A | Close | |
| AOV Category | 3 | N/A | 3 | |
| Flow Diagram / P&ID | M-207 | N/A | M-207 | |
| Calculation Reference | V&V Test Case RS-007 | N/A | V&V Test Case RS-007 | |
| Calc Reference Rev | 1 | N/A | 1 | |
| Valve Configuration | Rising Stem | N/A | Rising Stem | |
| Valve Type | Globe | N/A | Globe | |
| Balanced / Unbalanced | Balanced | N/A | Balanced | |
| Flow Direction | Flow Over | N/A | Flow Over | |
| Valve Action | Push Down to Close | N/A | Push Down to Close | |
| Actuator Type | Air Cylinder | N/A | Air Cylinder | |
| Air Cylinder Type | Single Acting- Spring Return | N/A | Single Acting- Spring Return | |
| Actuator Action | Reverse | N/A | Reverse | |
| Valve Manufacturer | Powell | N/A | Powell | |
| Valve Model | DR-6326 | N/A | DR-6326 | |
| Valve Size | 6.00 | N/A | 6.00 | |
| Valve Serial No | SF-012345 | N/A | SF-012345 | |
| Valve PO Number | N-987654 | N/A | N-987654 | |
| Valve Stem Diameter | 1.000 | N/A | 1.000 | |
| Stem Material | A182 Type F6 | N/A | A182 Type F6 | |
| Young's Modulus (E) | 31,600,000 | N/A | 31,600,000 | |

(WIP) Rev 1 | Rich Enos | 12/22/11 15:53 | NOT APPROVED | N/A

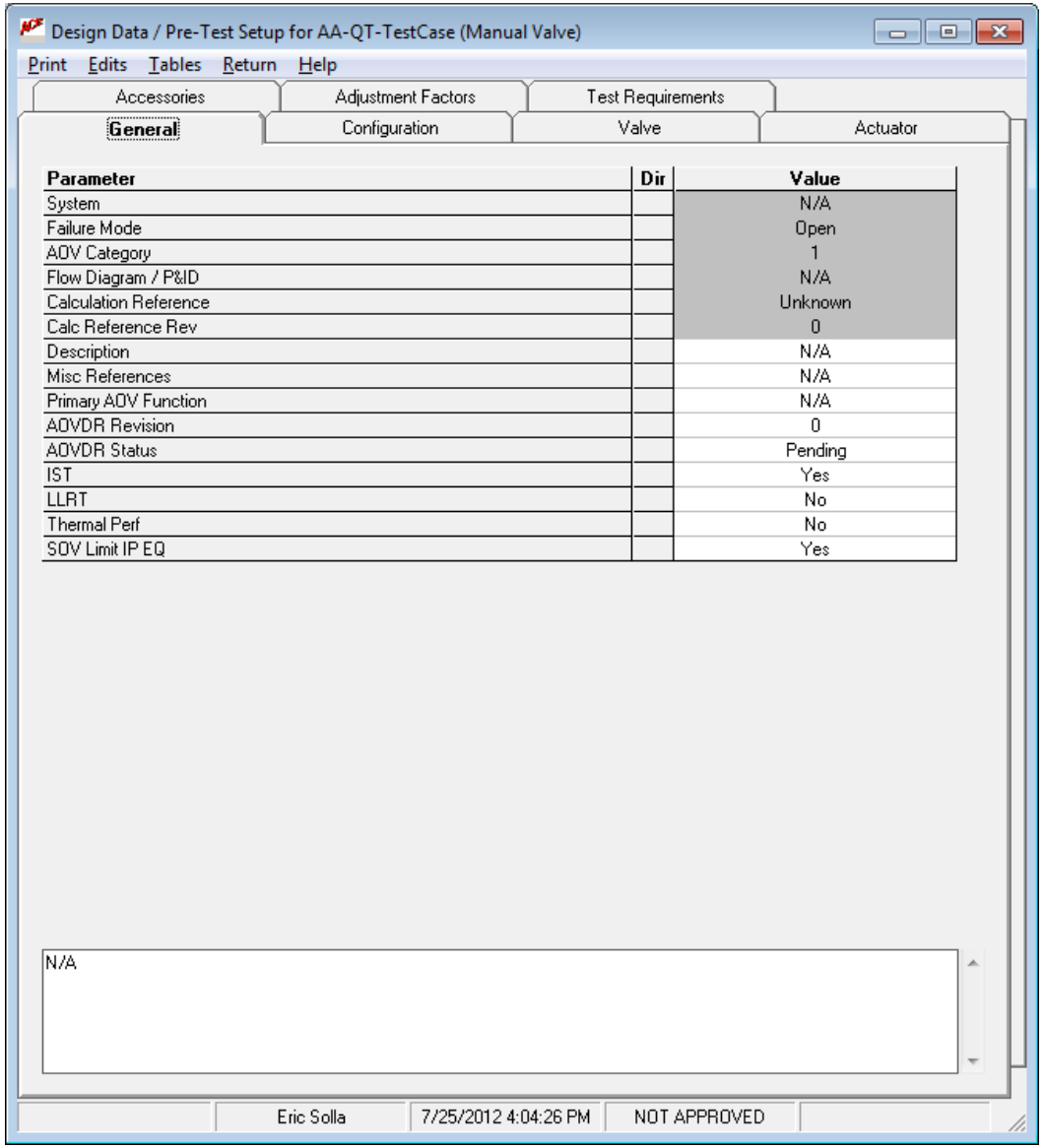
# ACETest Basics

- **Design Inputs**
  - **Update Data Imported from ACE**



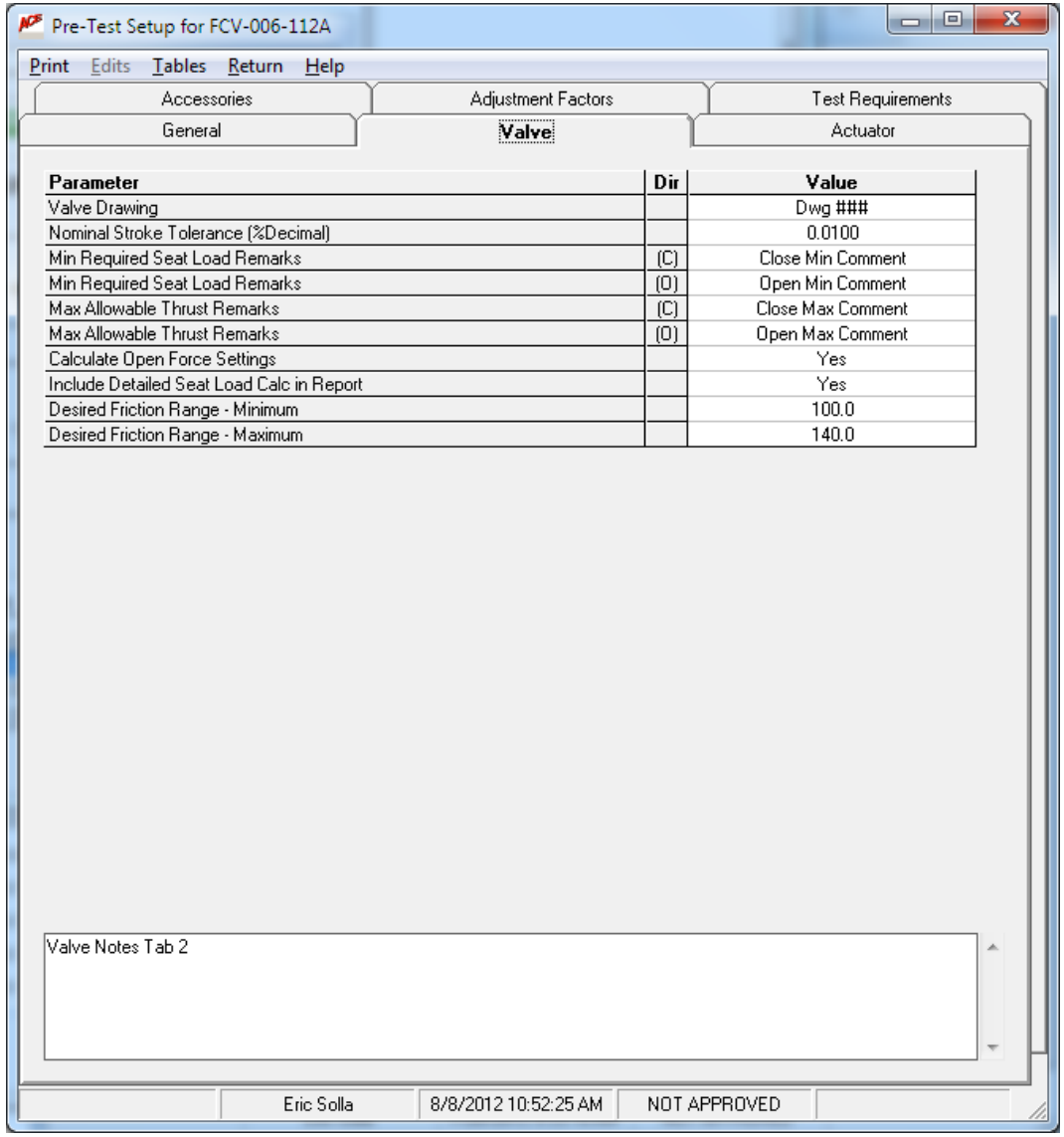
# ACETest Basics

- **Pre-Test Inputs**
  - Manual Valve
  - Includes Design & Pre-Test Inputs



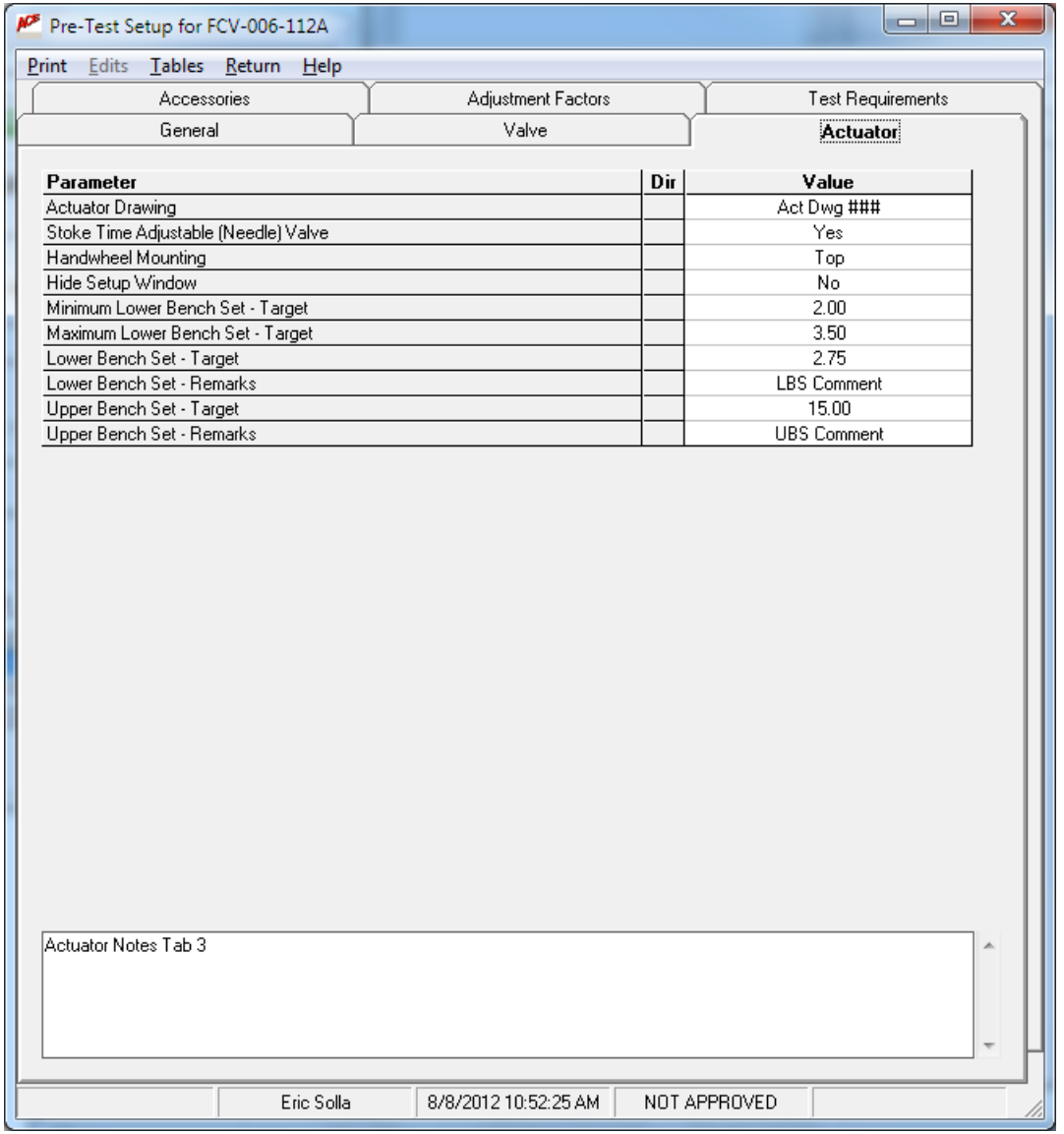
# ACETest Basics

- **Pre-Test Inputs**
  - **Valve Tab**



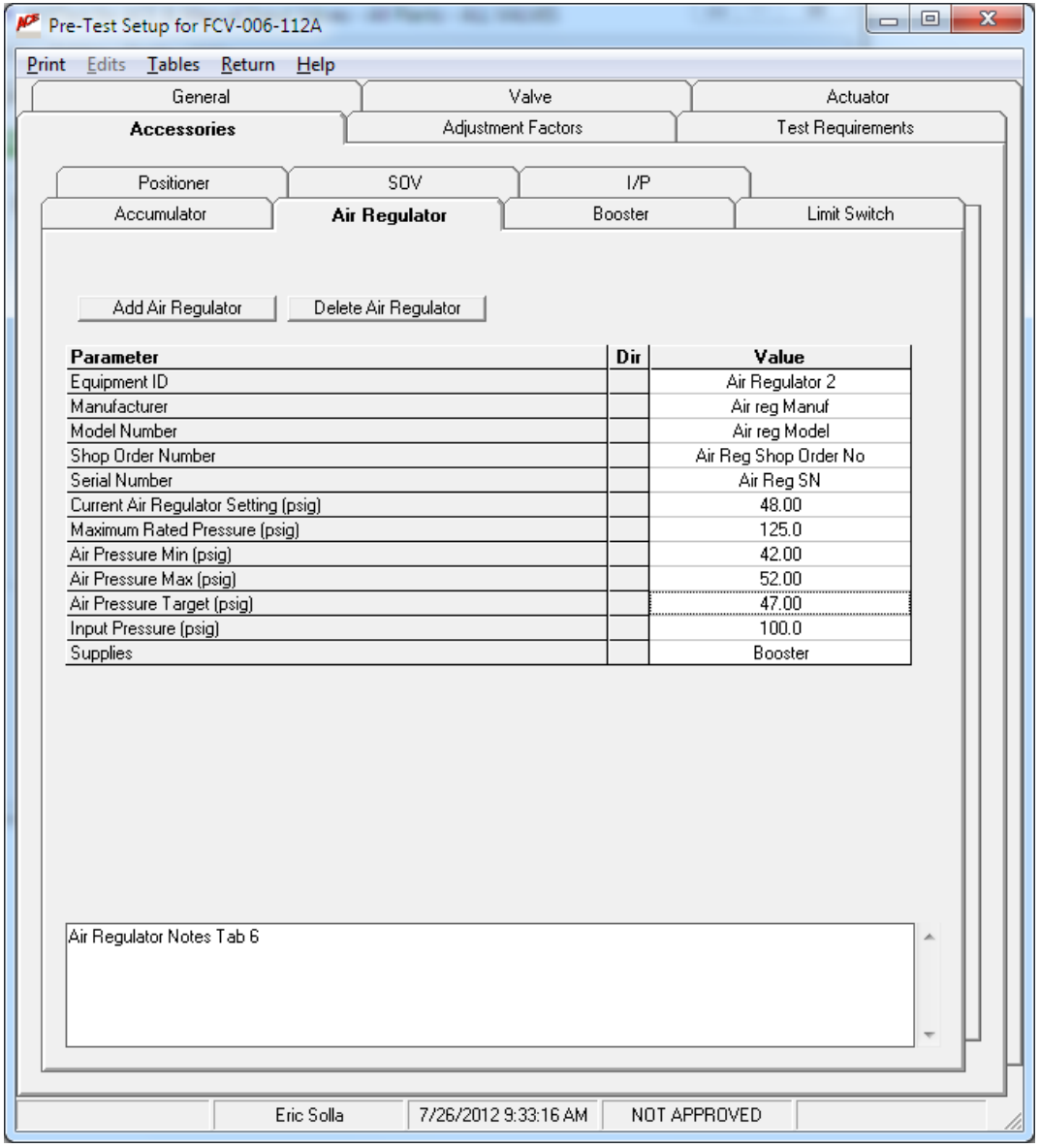
# ACETest Basics

- **Pre-Test Inputs**
  - **Actuator Tab**



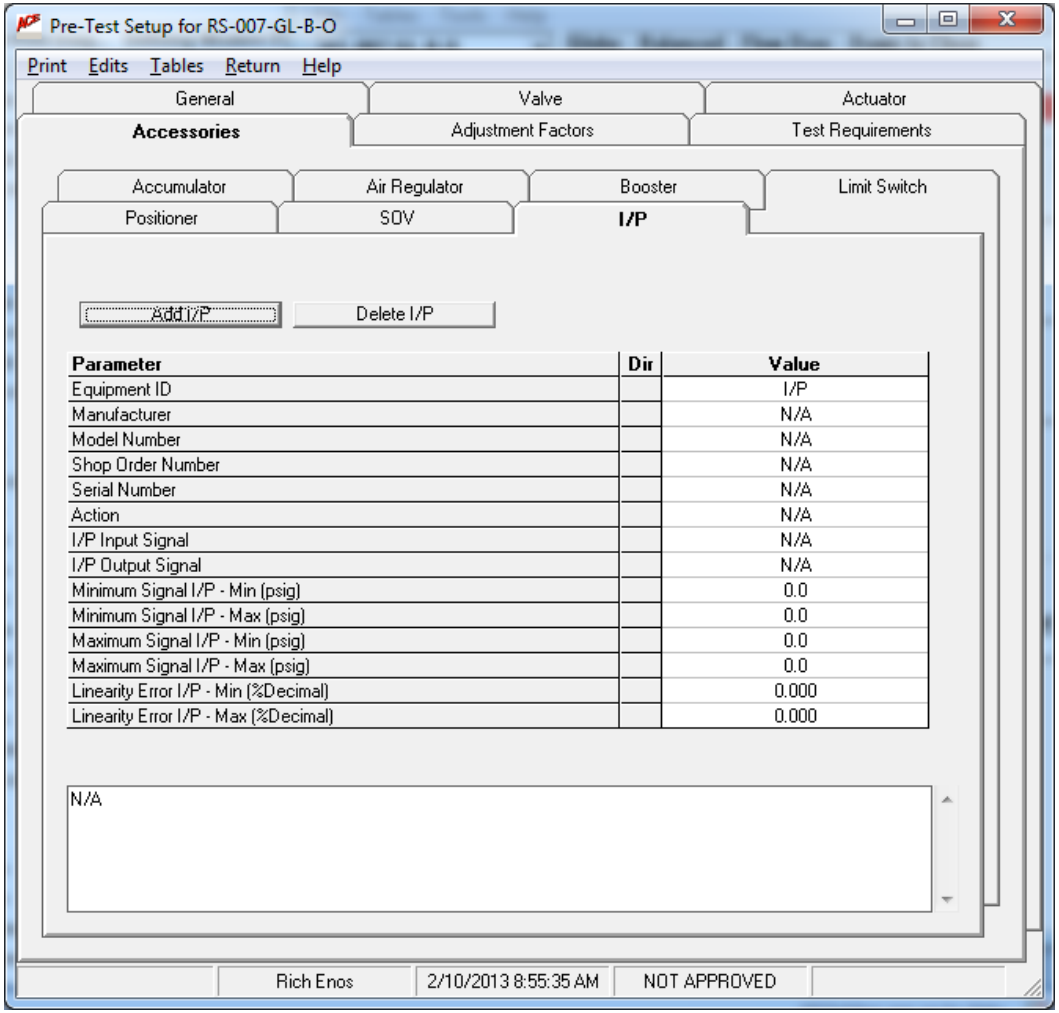
# ACETest Basics

- Accessories
  - Imported from ACE
  - Additional Fields added



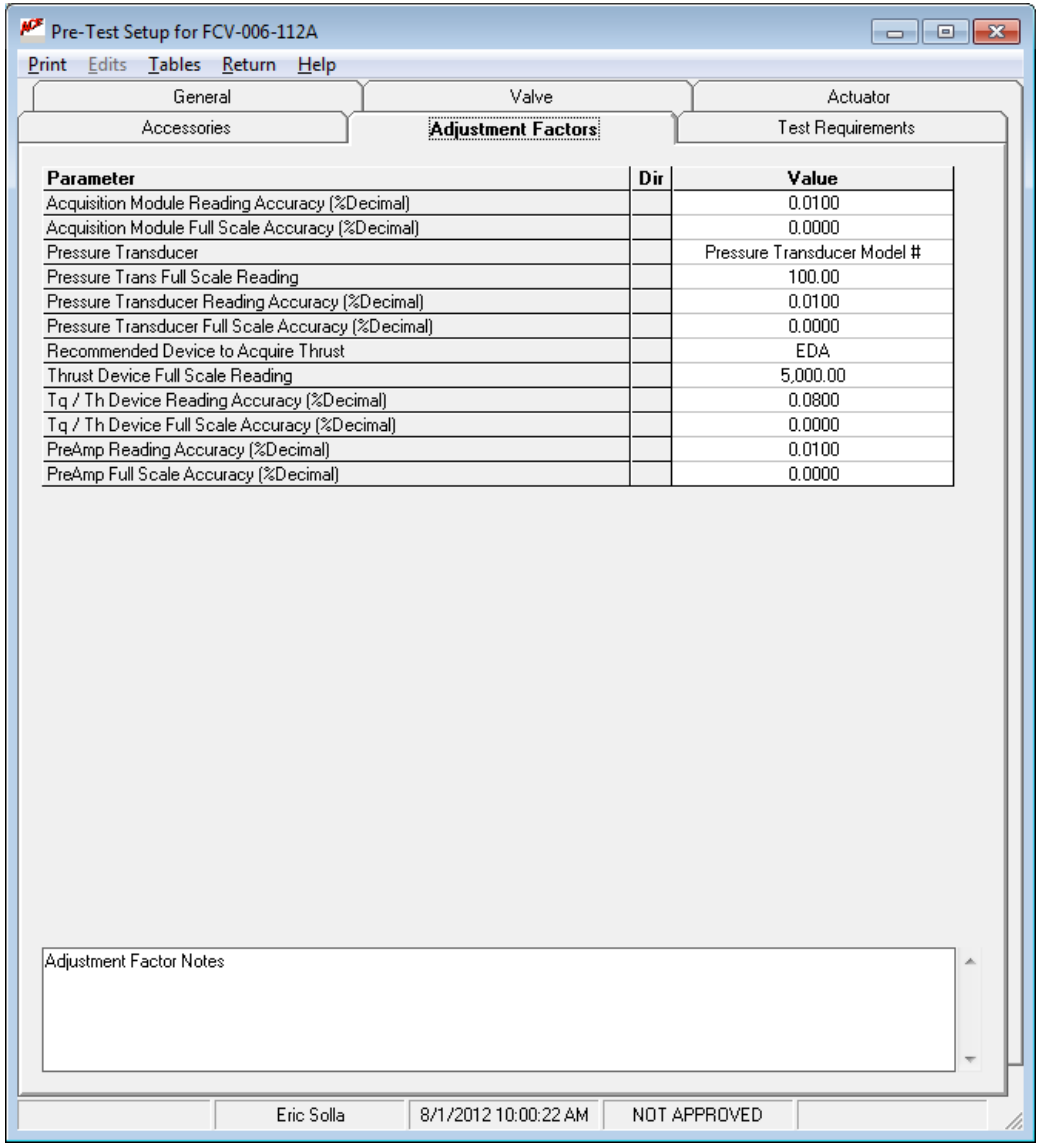
# ACETest Basics

- Accessories
  - I/P Added



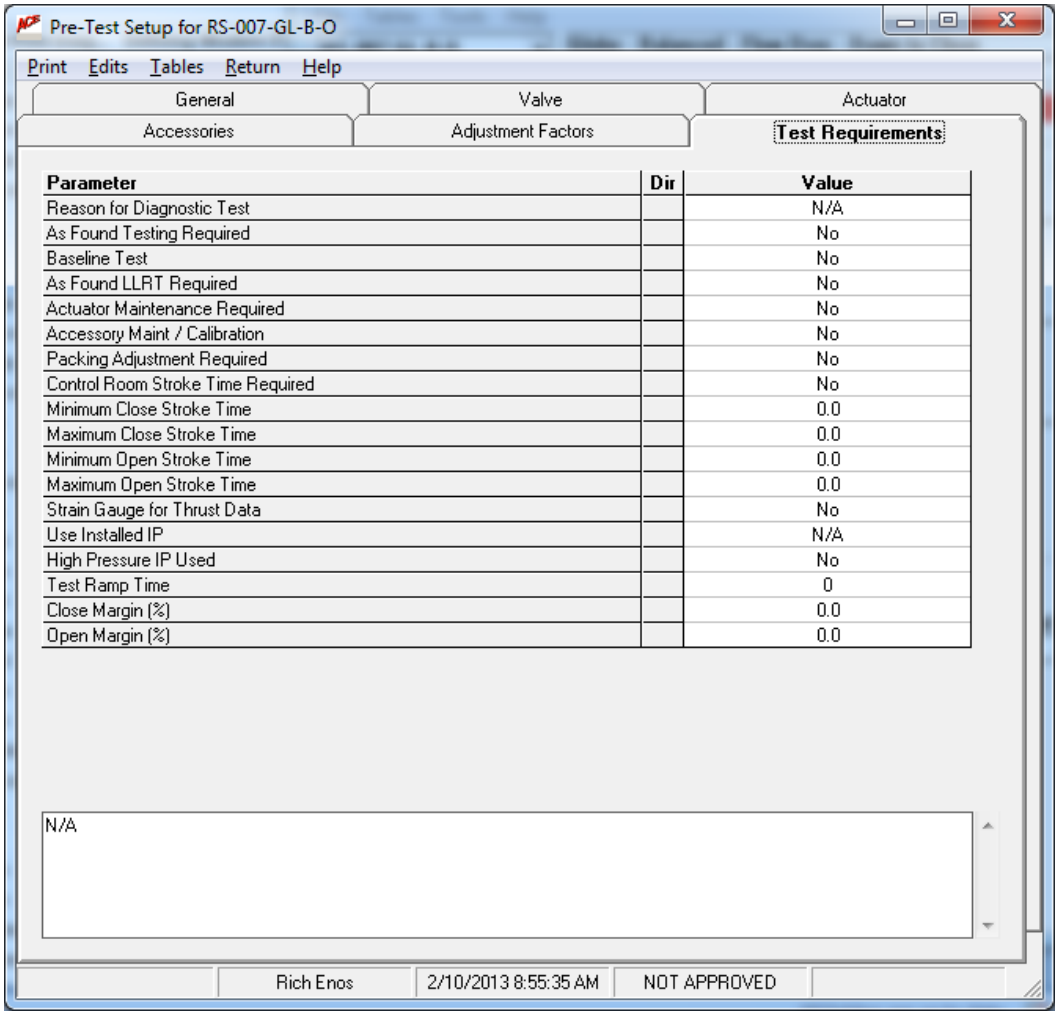
# ACETest Basics

- **Adjustment Factors**
  - Not same as ACE



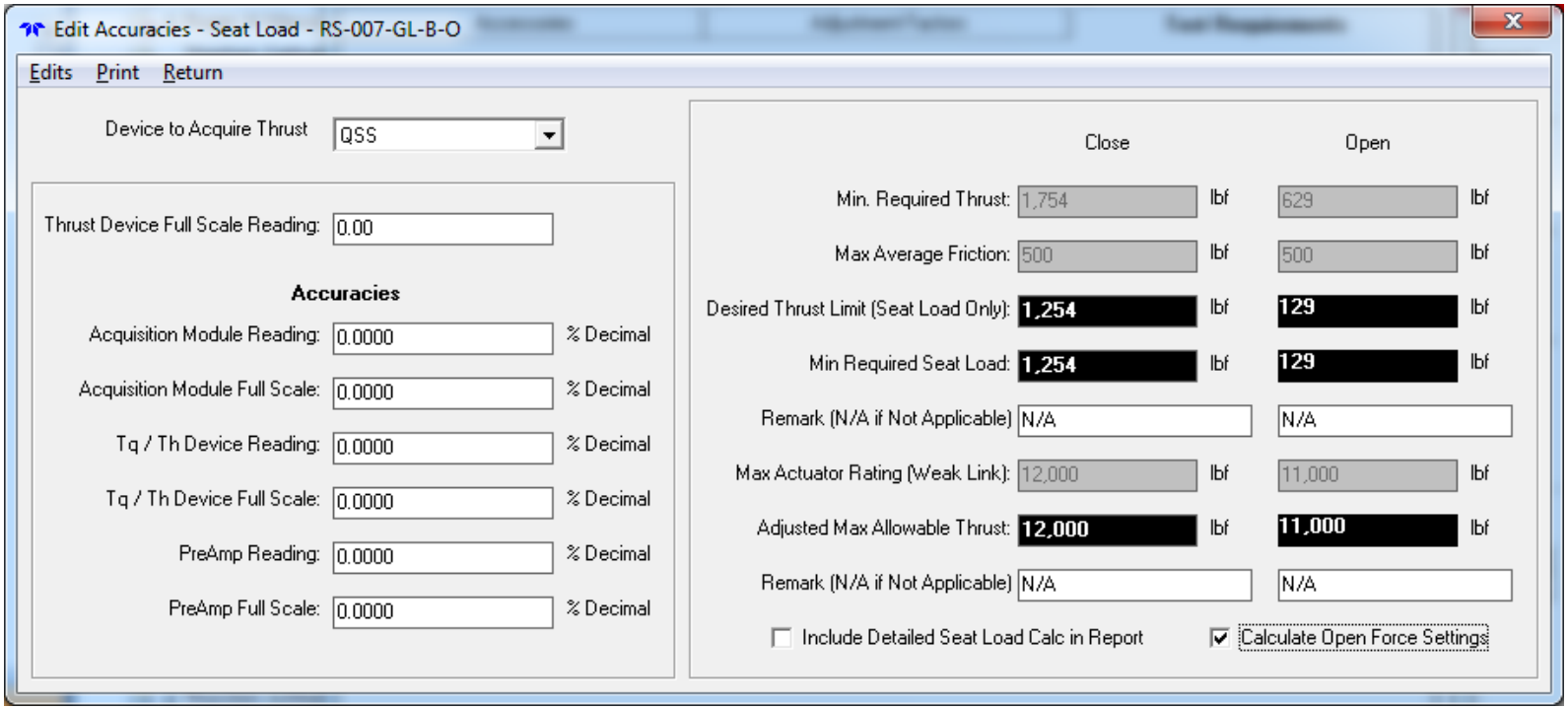
# ACETest Basics

- Test Requirements



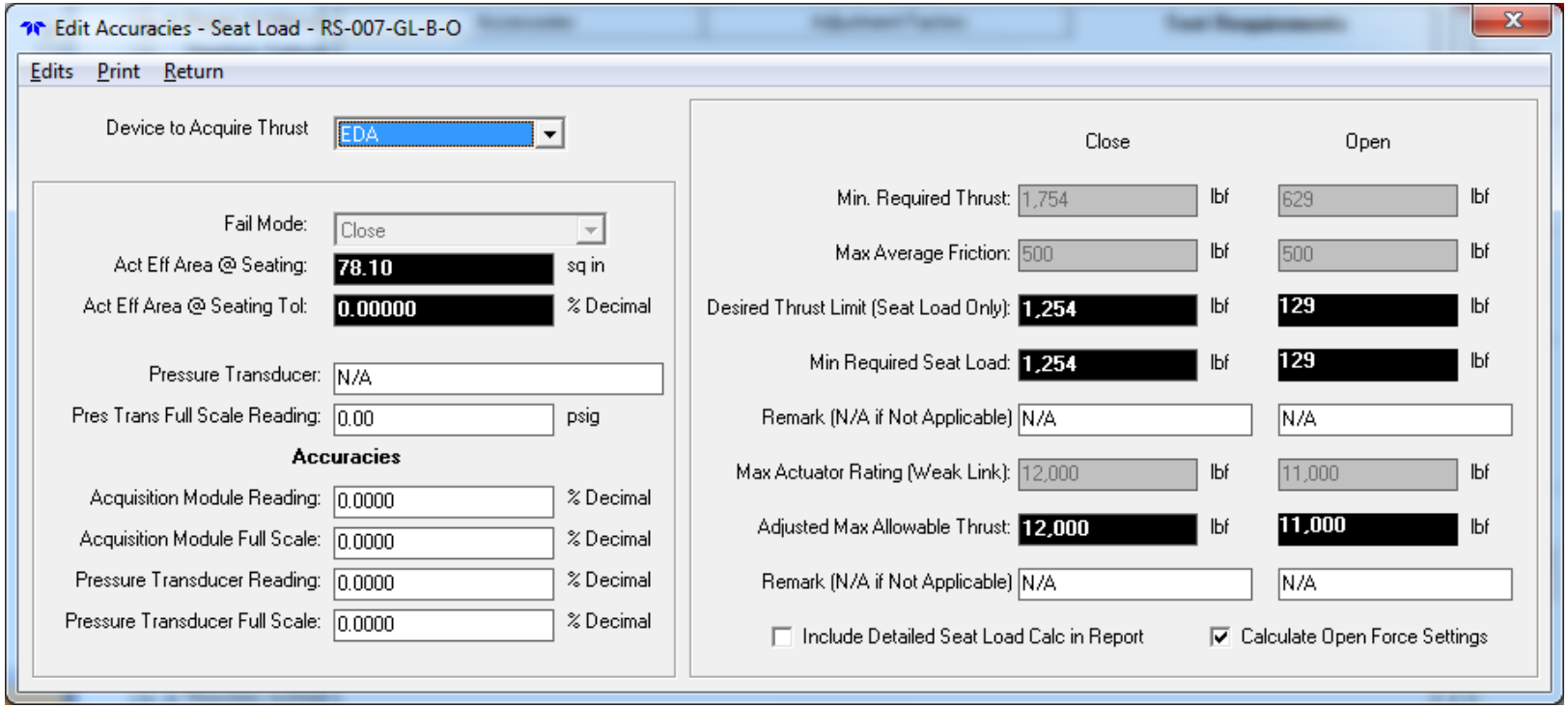
# ACETest Basics

- Seat Load Calc (QSS)
  - Device Dependant
  - Open Calc Optional
  - Detailed Calc in Report Optional



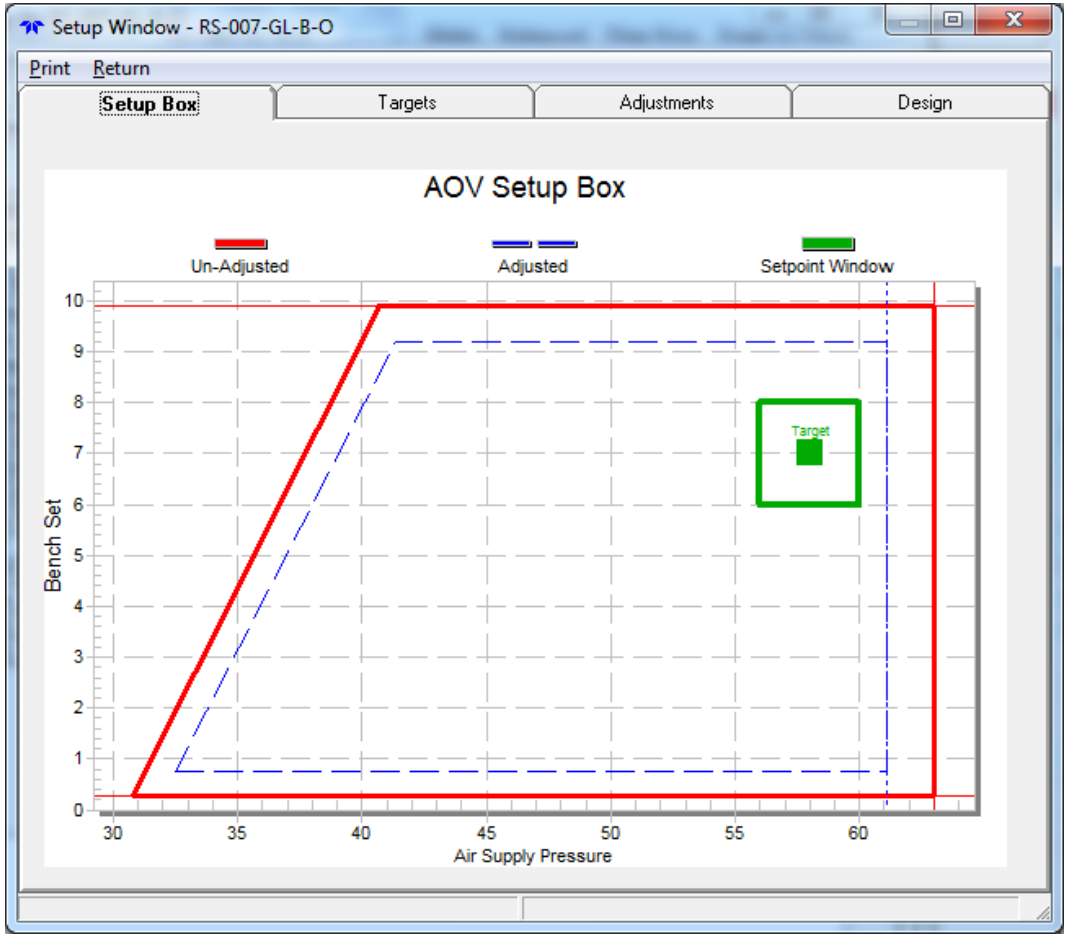
# ACETest Basics

- **Seat Load Calc (EDA)**
  - Device Dependant
  - Open Calc Optional
  - Detailed Calc in Report Optional



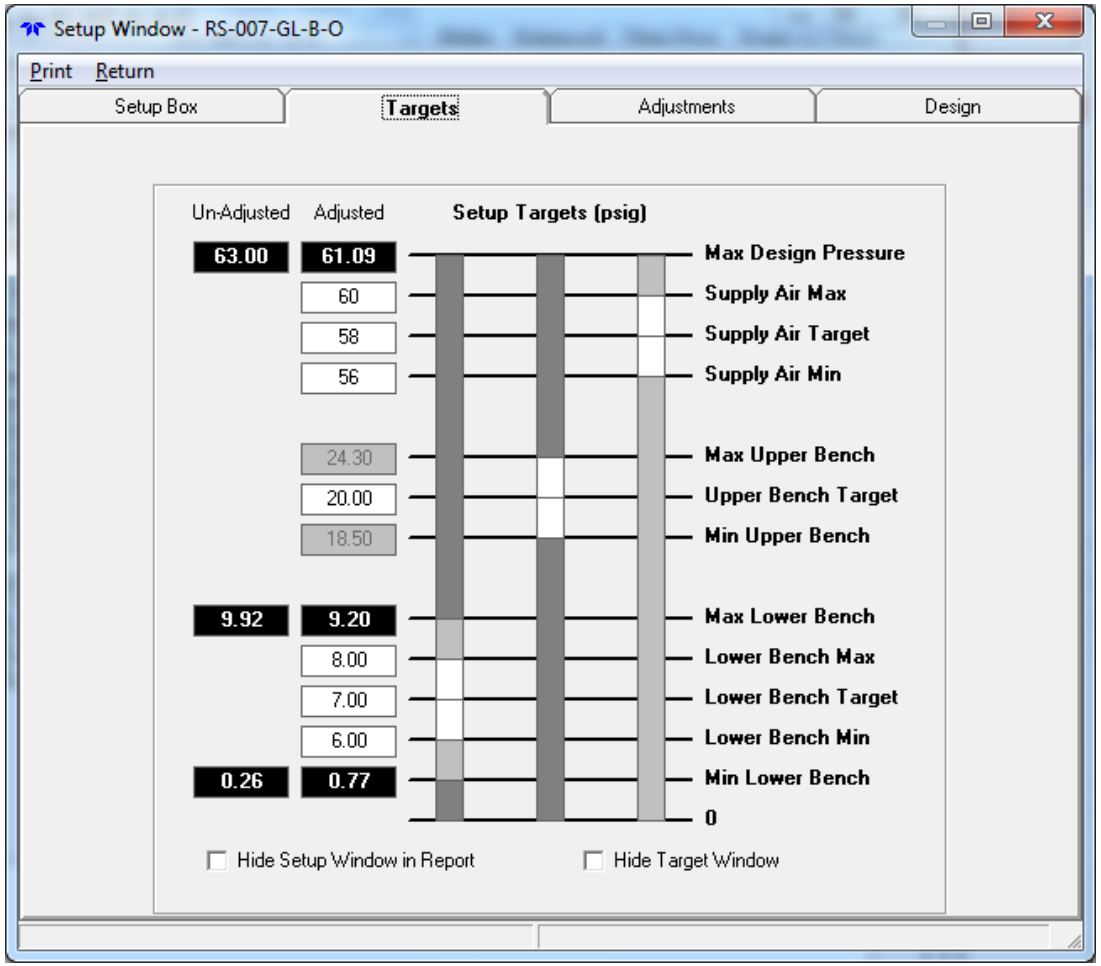
# ACETest Basics

- AOV Setup Box



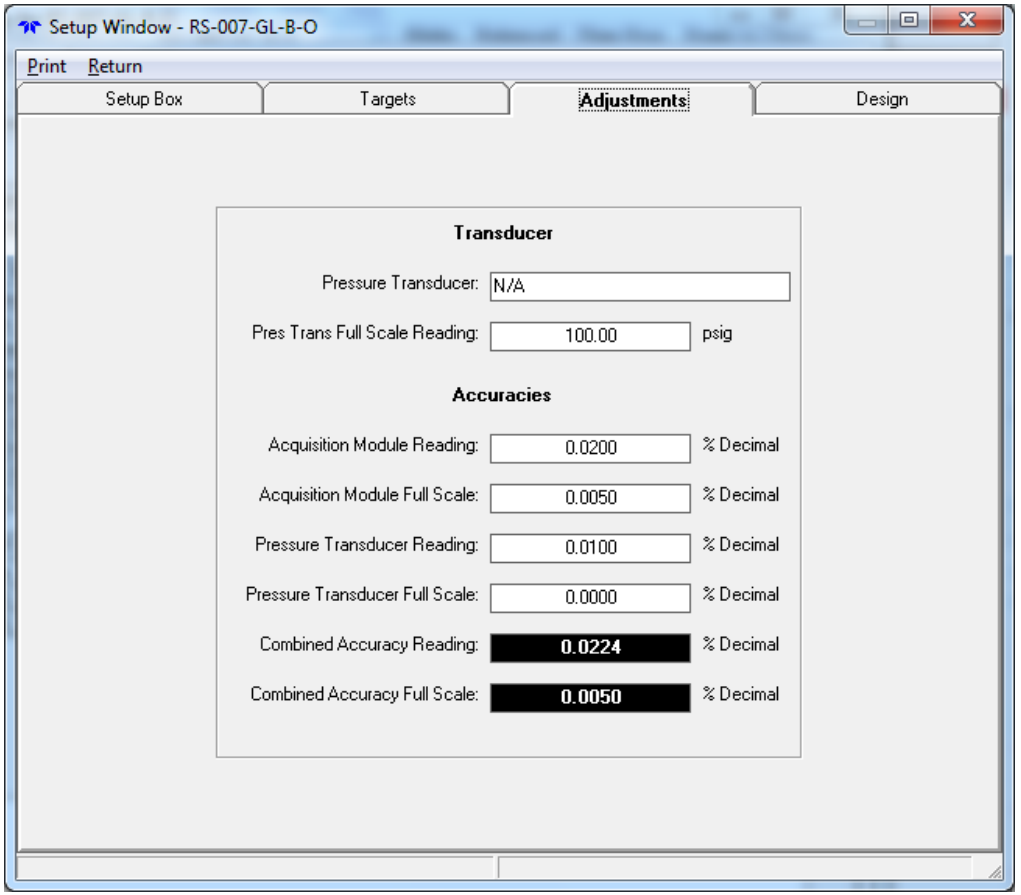
# ACETest Basics

- **AOV Setup Box**
  - **Targets**



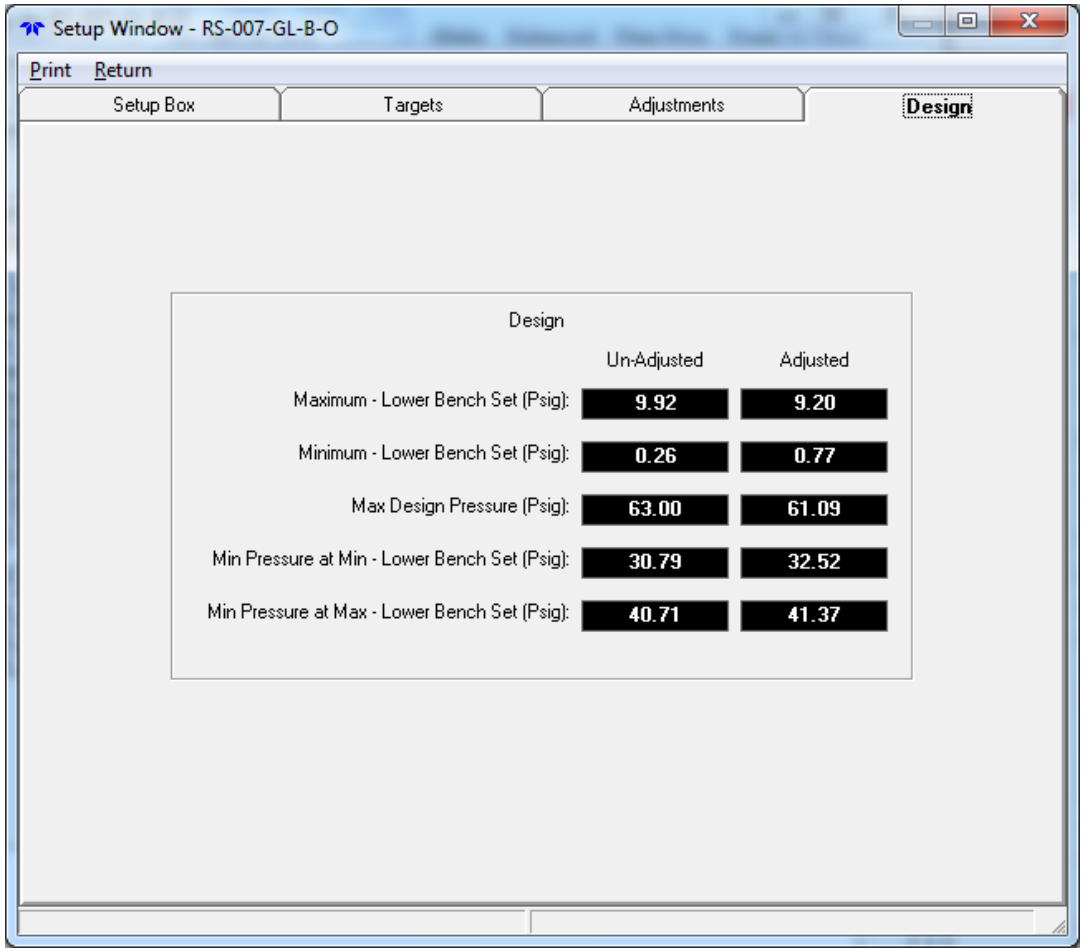
# ACETest Basics

- **AOV Setup Box**
  - **Adjustments**



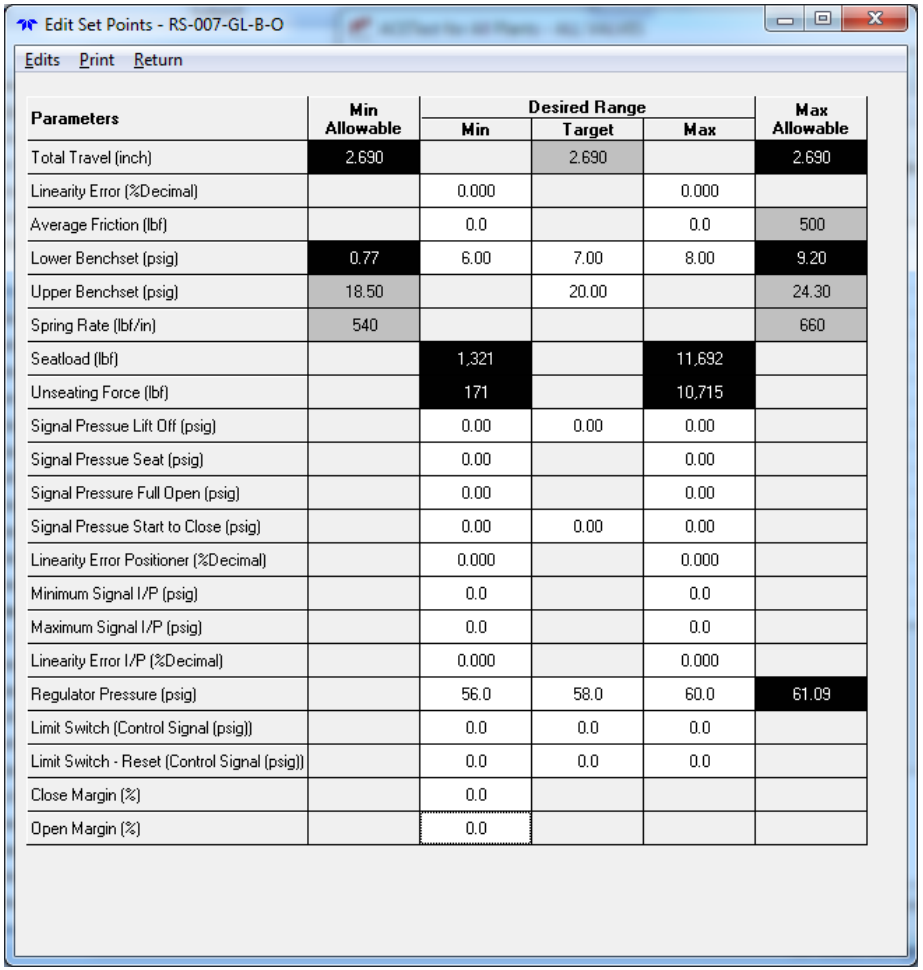
# ACETest Basics

- **AOV Setup Box**
  - **Design Calculated Outputs**



# ACETest Basics

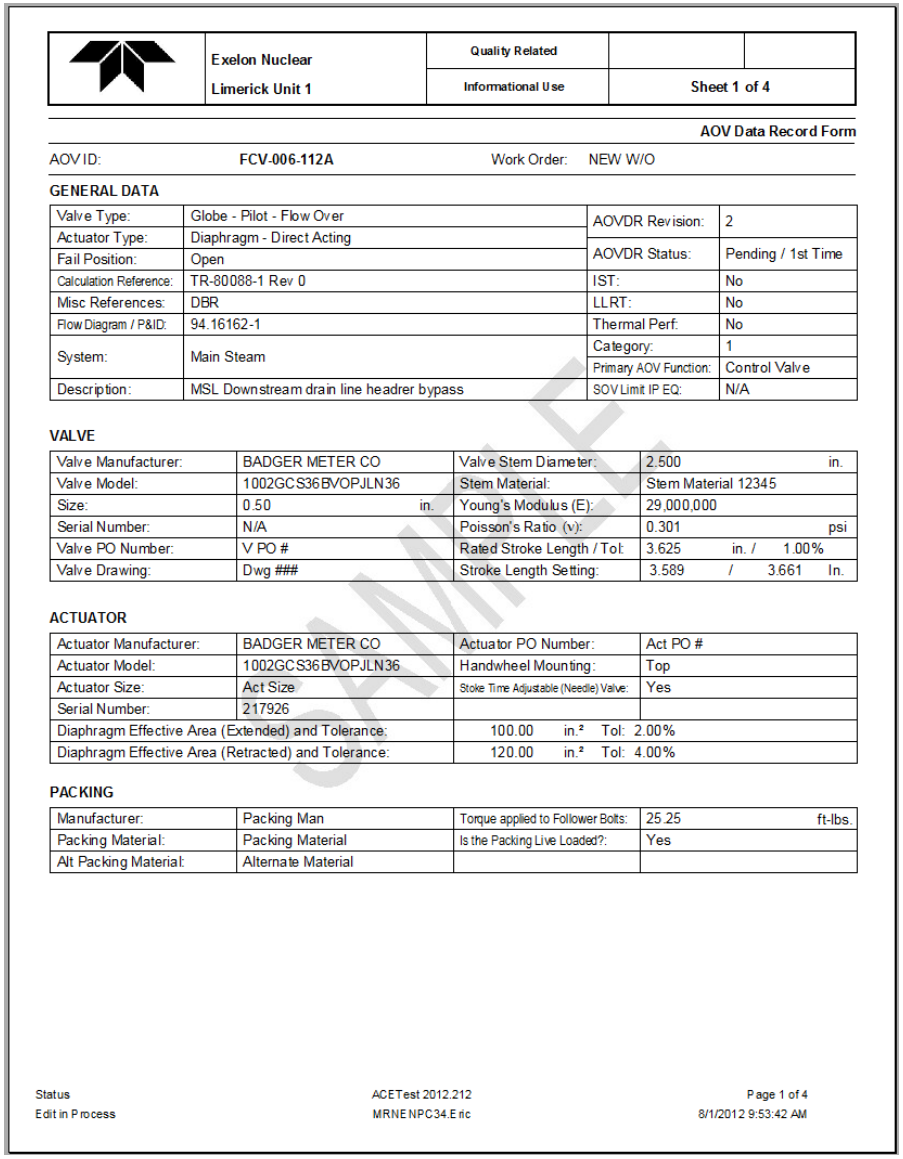
- **Set Points**
  - **Used in Post Test Review**




| Parameters | Min Allowable | Desired Range | | | Max Allowable |
|---|---|---|---|---|---|
| | | Min | Target | Max | |
| Total Travel (inch) | 2.690 | | 2.690 | | 2.690 |
| Linearity Error (%Decimal) | | 0.000 | | 0.000 | |
| Average Friction (lbf) | | 0.0 | | 0.0 | 500 |
| Lower Benchset (psig) | 0.77 | 6.00 | 7.00 | 8.00 | 9.20 |
| Upper Benchset (psig) | 18.50 | | 20.00 | | 24.30 |
| Spring Rate (lbf/in) | 540 | | | | 660 |
| Seatload (lbf) | | 1,321 | | 11,692 | |
| Unseating Force (lbf) | | 171 | | 10,715 | |
| Signal Pressue Lift Off (psig) | | 0.00 | 0.00 | 0.00 | |
| Signal Pressue Seat (psig) | | 0.00 | | 0.00 | |
| Signal Pressure Full Open (psig) | | 0.00 | | 0.00 | |
| Signal Pressue Start to Close (psig) | | 0.00 | 0.00 | 0.00 | |
| Linearity Error Positioner (%Decimal) | | 0.000 | | 0.000 | |
| Minimum Signal I/P (psig) | | 0.0 | | 0.0 | |
| Maximum Signal I/P (psig) | | 0.0 | | 0.0 | |
| Linearity Error I/P (%Decimal) | | 0.000 | | 0.000 | |
| Regulator Pressure (psig) | | 56.0 | 58.0 | 60.0 | 61.09 |
| Limit Switch (Control Signal (psig)) | | 0.0 | 0.0 | 0.0 | |
| Limit Switch - Reset (Control Signal (psig)) | | 0.0 | 0.0 | 0.0 | |
| Close Margin (%) | | 0.0 | | | |
| Open Margin (%) | | 0.0 | | | |

# ACETest Basics

- **Pre-Test Report**
  - 2 to 5 pages long
  - Only variable applicable to valve type shown
  - Header fields customizable



| | Exelon Nuclear<br>Limerick Unit 1 | Quality Related<br>Informational Use | Sheet 1 of 4 |
|---|---|---|---|

**AOV Data Record Form**

AOV ID: **FCV-006-112A** Work Order: NEW W/O

**GENERAL DATA**

| | | | |
|---|---|---|---|
| Valve Type: | Globe - Pilot - Flow Over | AOVDR Revision: | 2 |
| Actuator Type: | Diaphragm - Direct Acting | AOVDR Status: | Pending / 1st Time |
| Fail Position: | Open | | |
| Calculation Reference: | TR-80088-1 Rev 0 | IST: | No |
| Misc References: | DBR | LLRT: | No |
| Flow Diagram / P&ID: | 94.16162-1 | Thermal Perf: | No |
| System: | Main Steam | Category: | 1 |
| | | Primary AOV Function: | Control Valve |
| Description: | MSL Downstream drain line headrer bypass | SOV Limit IP EQ: | N/A |

**VALVE**

| | | | |
|---|---|---|---|
| Valve Manufacturer: | BADGER METER CO | Valve Stem Diameter: | 2.500 in. |
| Valve Model: | 1002GCS36BVOPJLN36 | Stem Material: | Stem Material 12345 |
| Size: | 0.50 in. | Young's Modulus (E): | 29,000,000 |
| Serial Number: | N/A | Poisson's Ratio (v): | 0.301 psi |
| Valve PO Number: | V PO # | Rated Stroke Length / Tol: | 3.625 in. / 1.00% |
| Valve Drawing: | Dwg ### | Stroke Length Setting: | 3.589 / 3.661 In. |

**ACTUATOR**

| | | | |
|---|---|---|---|
| Actuator Manufacturer: | BADGER METER CO | Actuator PO Number: | Act PO # |
| Actuator Model: | 1002GCS36BVOPJLN36 | Handwheel Mounting: | Top |
| Actuator Size: | Act Size | Stoke Time Adjustable (Needle) Valve: | Yes |
| Serial Number: | 217926 | | |
| Diaphragm Effective Area (Extended) and Tolerance: | | 100.00 in.² Tol: 2.00% | |
| Diaphragm Effective Area (Retracted) and Tolerance: | | 120.00 in.² Tol: 4.00% | |

**PACKING**

| | | | |
|---|---|---|---|
| Manufacturer: | Packing Man | Torque applied to Follower Bolts: | 25.25 ft-lbs. |
| Packing Material: | Packing Material | Is the Packing Live Loaded?: | Yes |
| Alt Packing Material: | Alternate Material | | |



Status
Edit in Process

ACETest 2012.212
MRNE NPC34.Eric

Page 1 of 4
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# ACETest Basics

- **Pre-Test Report**
  - **Only Accessories chosen are shown**

| | | | | |
|---|---|---|---|---|
| | NUCLEAR MANAGEMENT<br>Browns Ferry Unit 1 | Quality Related<br>Informational Use | | Sheet 2 of 3 |

AOV Data Record Form

AOV ID: BFN-1-LCV-006-0072A Work Order: ???????

**ACCESSORIES**

**POSITIONER**

| | | | |
|---|---|---|---|
| Equipment ID: | Positioner | Maximum Rated Pressure: | 0.0 psig. |
| Manufacturer: | Fisher Controls | Input Range: | 3 - 15 |
| Model: | N/A | Input Range Units: | psi |
| Shop Order Number: | N/A | Input Pressure to Positioner: | 0.0 psig. |
| Serial Number: | N/A | Positioner Action: | Direct Acting |

**AIR REGULATOR**

| | | | |
|---|---|---|---|
| Equipment ID: | Air Regulator | Air Pressure Range (Min/Max): | 63.00 / 65.00 psig. |
| Manufacturer: | Fisher Controls | Setting: | 65.00 psig. |
| Model: | N/A | Maximum Rated Pressure: | 0.0 psig. |
| Shop Order Number: | N/A | Input Pressure: | 0.0 psig. |
| Serial Number: | N/A | AR Supplies: | Positioner |

**LIMIT SWITCH**

| | | | | | |
|---|---|---|---|---|---|
| Equipment ID: | Limit Switch 1 | | Shop Order Number: | | N/A |
| Manufacturer: | N/A | | Serial Number: | | N/A |
| Model: | N/A | | | | |
| Limit Sw #1 | | | Degrees Rotation | | Remark (NA if Not Applicable) |
| Terminals 1 & 2 | | Target | Min | Max | |
| Contacts Close | Decrease Pressure | 10.0 | 8.0 | 14.0 | N/A |
| Reset | | 0.0 | 0.0 | 0.0 | |

| | | | | | |
|---|---|---|---|---|---|
| Equipment ID: | Limit Switch 2 | | Shop Order Number: | | N/A |
| Manufacturer: | N/A | | Serial Number: | | N/A |
| Model: | N/A | | | | |
| Limit Sw #2 | | | N/A | | Remark (NA if Not Applicable) |
| Terminals 5 & 6 | | Target | Min | Max | |
| Contacts Open | Decrease Pressure | 10.0 | 8.0 | 14.0 | N/A |
| Reset | | 0.0 | 0.0 | 0.0 | |

# ACETest Basics

- **Pre-Test Report**
  - Force Settings (Optional)
  - Benchset Settings
  - Testing Requirements

| | Exelon Nuclear<br>Limerick Unit 1 | Quality Related<br>Informational Use | Sheet 3 of 4 |
|---|---|---|---|

**AOV Data Record Form**

AOV ID: **FCV-006-112A** Work Order: NEW W/O

**FORCE SETTINGS (lbs) - Measurement Device: EDA**

| OPEN SETTINGS | | Remark (NA if Not Applicable) |
|---|---|---|
| Open Adj Min Unseating Force | 1,190 | Open Min Comment |
| Open Adj Max Unseating Force | 5,799 | Open Max Comment |
| **CLOSE SETTINGS** | | Remark (NA if Not Applicable) |
| Close Adj Min Seating Force | 1,086 | Close Min Comment |
| Close Total Adj Max Seating Force | 6,766 | Close Max Comment |

**BENCHSET SETTINGS (psig)**

| | Between | | Remark (NA if Not Applicable) |
|---|---|---|---|
| Lower Benchset | 1.25 | 4.01 | LBS Comment |
| Lower Benchset Target | 2.75 | | |
| Upper Benchset | 14.0 | 16.0 | UBS Comment |
| Upper Benchset Target | 15.00 | | |

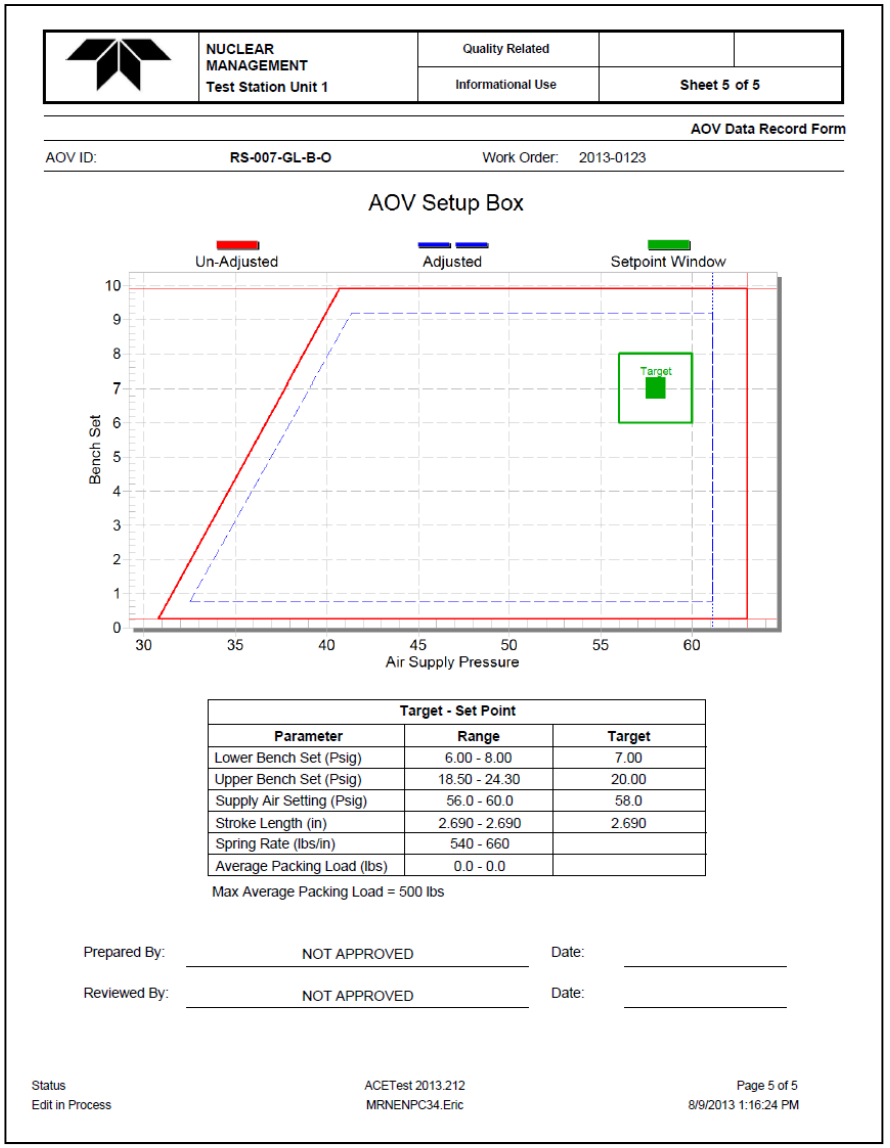
**TEST REQUIREMENTS**

| | | | |
|---|---|---|---|
| Reason for Diagnostic Test: | PVT / PM | Packing Adjustment Required: | No |
| As Found Testing Required: | Yes | Control Room Stroke Time Reqd: | No |
| Baseline Test: | No | Strain Gauge for Thrust Data: | No |
| As Found LLRT Required: | Yes | Use Installed IP: | Test |
| Actuator Maintenance Required: | No | High Pressure IP Used: | Yes |
| Accessory Maint / Calibration: | No | Test Ramp Time: | 0 |

Special Test Instructions:
Special Test Instructions - Tab 19

# ACETest Basics

- **Pre-Test Report**
  - Setup Window
  - Optional



NUCLEAR MANAGEMENT
Test Station Unit 1

Quality Related
Informational Use

Sheet 5 of 5

AOV Data Record Form

AOV ID: RS-007-GL-B-O  Work Order: 2013-0123

AOV Setup Box

Un-Adjusted  Adjusted  Setpoint Window

Bench Set

Air Supply Pressure

Target

| Target - Set Point | | |
|---|---|---|
| Parameter | Range | Target |
| Lower Bench Set (Psig) | 6.00 - 8.00 | 7.00 |
| Upper Bench Set (Psig) | 18.50 - 24.30 | 20.00 |
| Supply Air Setting (Psig) | 56.0 - 60.0 | 58.0 |
| Stroke Length (in) | 2.690 - 2.690 | 2.690 |
| Spring Rate (lbs/in) | 540 - 660 | |
| Average Packing Load (lbs) | 0.0 - 0.0 | |

Max Average Packing Load = 500 lbs

Prepared By: NOT APPROVED  Date:

Reviewed By: NOT APPROVED  Date:

Status
Edit in Process

ACETest 2013.212
MRNENPC34.Eric

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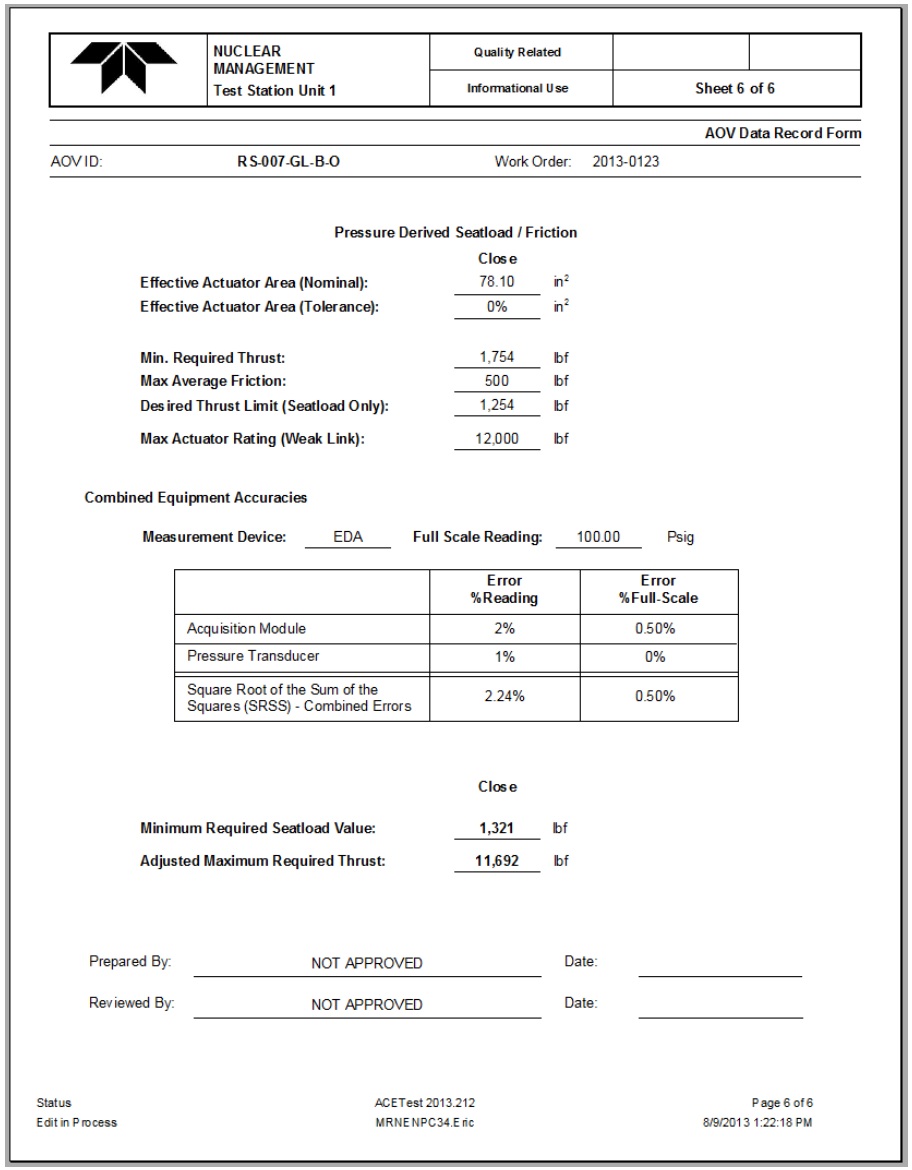
# ACETest Basics

- Pre Test Report
  - Detailed Seat load Calc
  - Optional



| NUCLEAR MANAGEMENT<br>Test Station Unit 1 | Quality Related<br>Informational Use | Sheet 6 of 6 |
|---|---|---|

AOV Data Record Form

AOV ID: RS-007-GL-B-O Work Order: 2013-0123

**Pressure Derived Seatload / Friction**

| | Close | |
|---|---|---|
| Effective Actuator Area (Nominal): | 78.10 | $in^2$ |
| Effective Actuator Area (Tolerance): | 0% | $in^2$ |
| Min. Required Thrust: | 1,754 | lbf |
| Max Average Friction: | 500 | lbf |
| Desired Thrust Limit (Seatload Only): | 1,254 | lbf |
| Max Actuator Rating (Weak Link): | 12,000 | lbf |

**Combined Equipment Accuracies**

Measurement Device: EDA Full Scale Reading: 100.00 Psig

| | Error %Reading | Error %Full-Scale |
|---|---|---|
| Acquisition Module | 2% | 0.50% |
| Pressure Transducer | 1% | 0% |
| Square Root of the Sum of the Squares (SRSS) - Combined Errors | 2.24% | 0.50% |

| | Close | |
|---|---|---|
| Minimum Required Seatload Value: | 1,321 | lbf |
| Adjusted Maximum Required Thrust: | 11,692 | lbf |

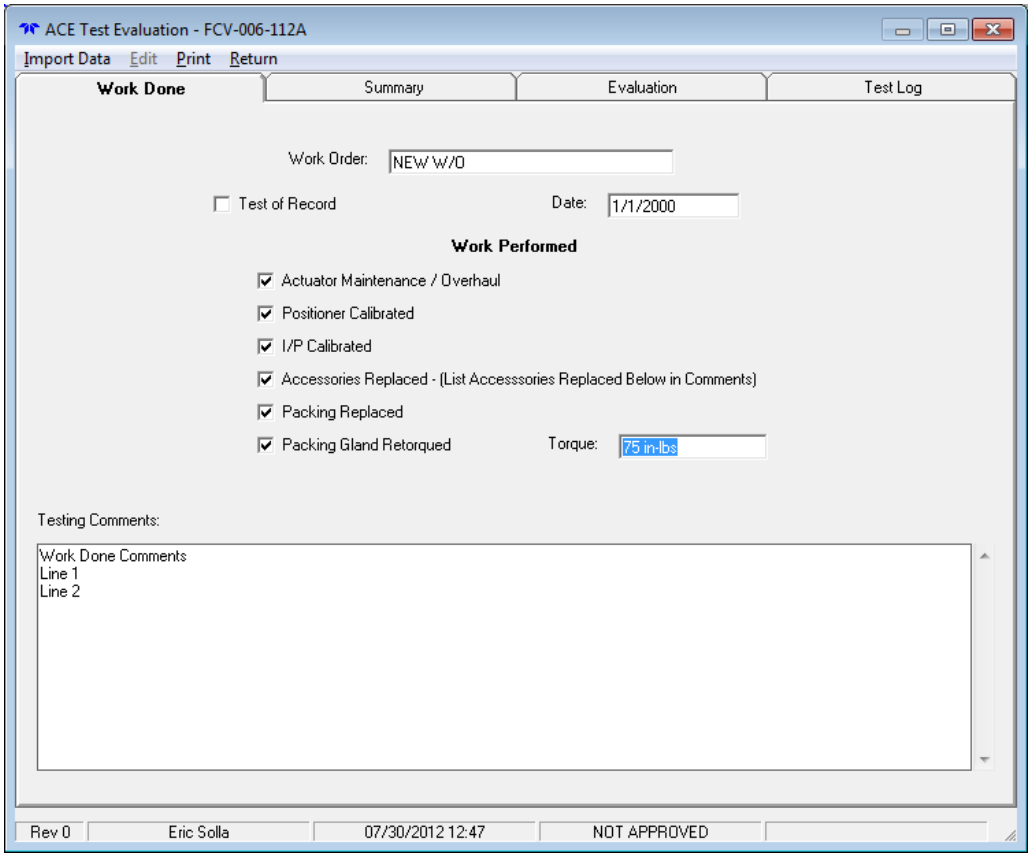
Prepared By: NOT APPROVED Date:

Reviewed By: NOT APPROVED Date:

Status: Edit in Process | ACETest 2013.212 MRNENPC34.Eric | Page 6 of 6 8/9/2013 1:22:18 PM

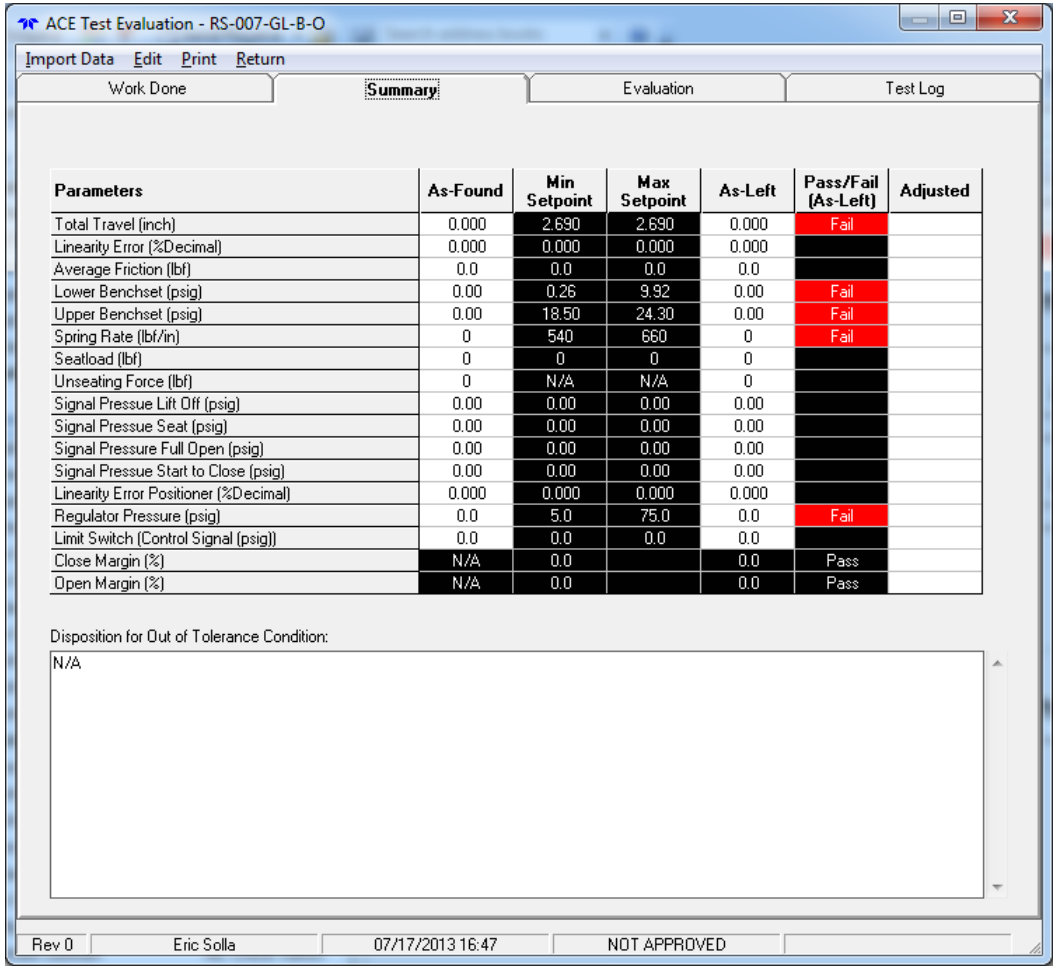
# ACETest Basics

- **Post Test Evaluation**
  - **Work Done**



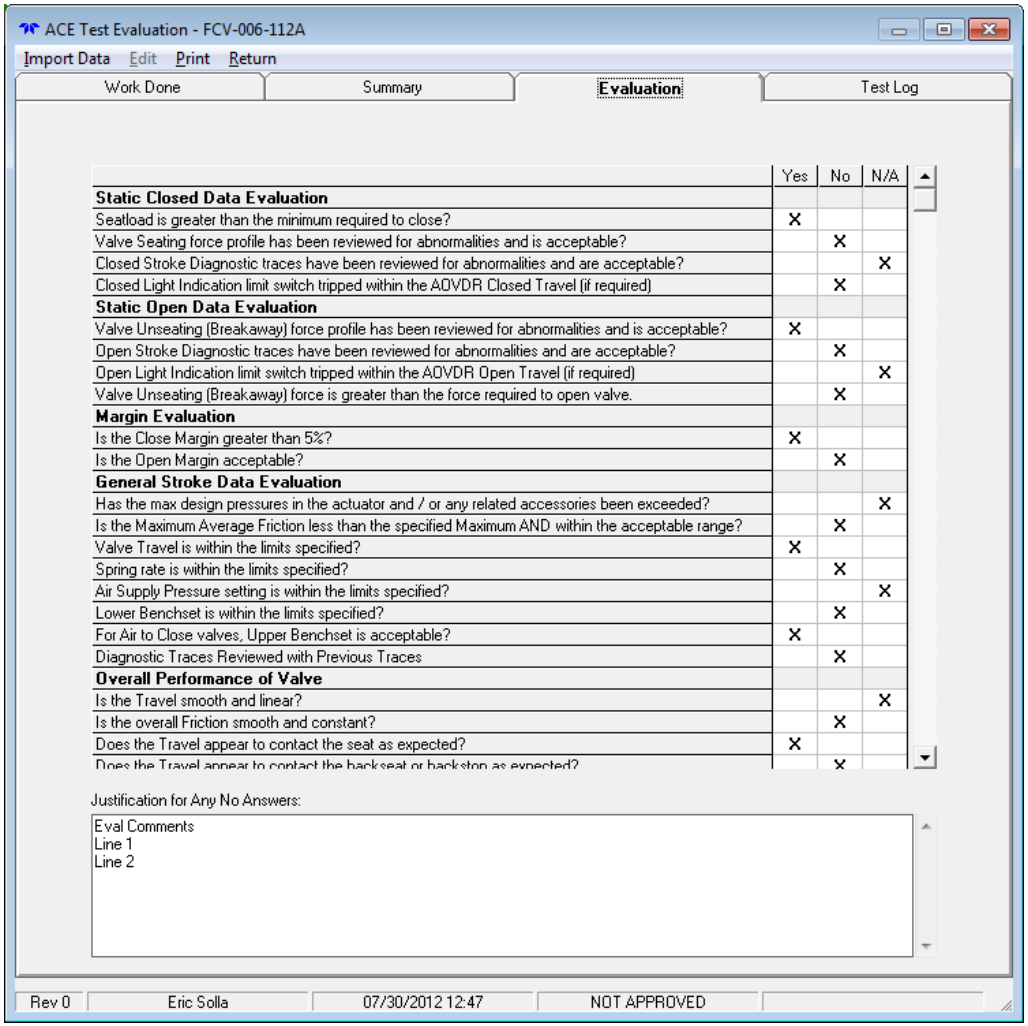
# ACETest Basics

- Post Test Evaluation
  - Summary
  - Import Data
  - Setpoints calculated
  - Pass/Fail calculated with setpoints
  - Adjusted
    - N/A
    - Yes
    - No



# ACETest Basics

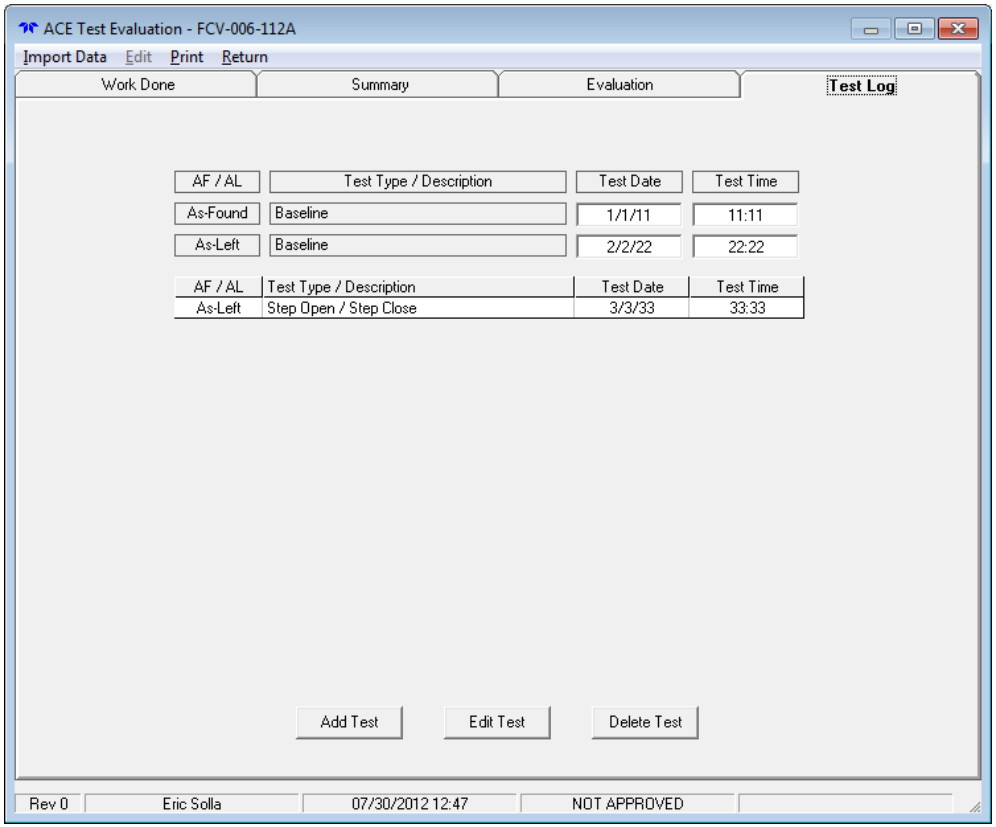
- **Post Test Evaluation**
  - **Evaluation**
  - **Only Questions Applicable to Valve Type Shown**
  - **Questions will be customizable**




| | Yes | No | N/A |
|---|---|---|---|
| **Static Closed Data Evaluation** | | | |
| Seatload is greater than the minimum required to close? | X | | |
| Valve Seating force profile has been reviewed for abnormalities and is acceptable? | | X | |
| Closed Stroke Diagnostic traces have been reviewed for abnormalities and are acceptable? | | | X |
| Closed Light Indication limit switch tripped within the AOVDR Closed Travel (if required) | | X | |
| **Static Open Data Evaluation** | | | |
| Valve Unseating (Breakaway) force profile has been reviewed for abnormalities and is acceptable? | X | | |
| Open Stroke Diagnostic traces have been reviewed for abnormalities and are acceptable? | | X | |
| Open Light Indication limit switch tripped within the AOVDR Open Travel (if required) | | | X |
| Valve Unseating (Breakaway) force is greater than the force required to open valve. | | X | |
| **Margin Evaluation** | | | |
| Is the Close Margin greater than 5%? | X | | |
| Is the Open Margin acceptable? | | X | |
| **General Stroke Data Evaluation** | | | |
| Has the max design pressures in the actuator and / or any related accessories been exceeded? | | | X |
| Is the Maximum Average Friction less than the specified Maximum AND within the acceptable range? | | X | |
| Valve Travel is within the limits specified? | X | | |
| Spring rate is within the limits specified? | | X | |
| Air Supply Pressure setting is within the limits specified? | | | X |
| Lower Benchset is within the limits specified? | | X | |
| For Air to Close valves, Upper Benchset is acceptable? | X | | |
| Diagnostic Traces Reviewed with Previous Traces | | X | |
| **Overall Performance of Valve** | | | |
| Is the Travel smooth and linear? | | | X |
| Is the overall Friction smooth and constant? | | X | |
| Does the Travel appear to contact the seat as expected? | X | | |
| Does the Travel appear to contact the backseat or backstop as expected? | | X | |

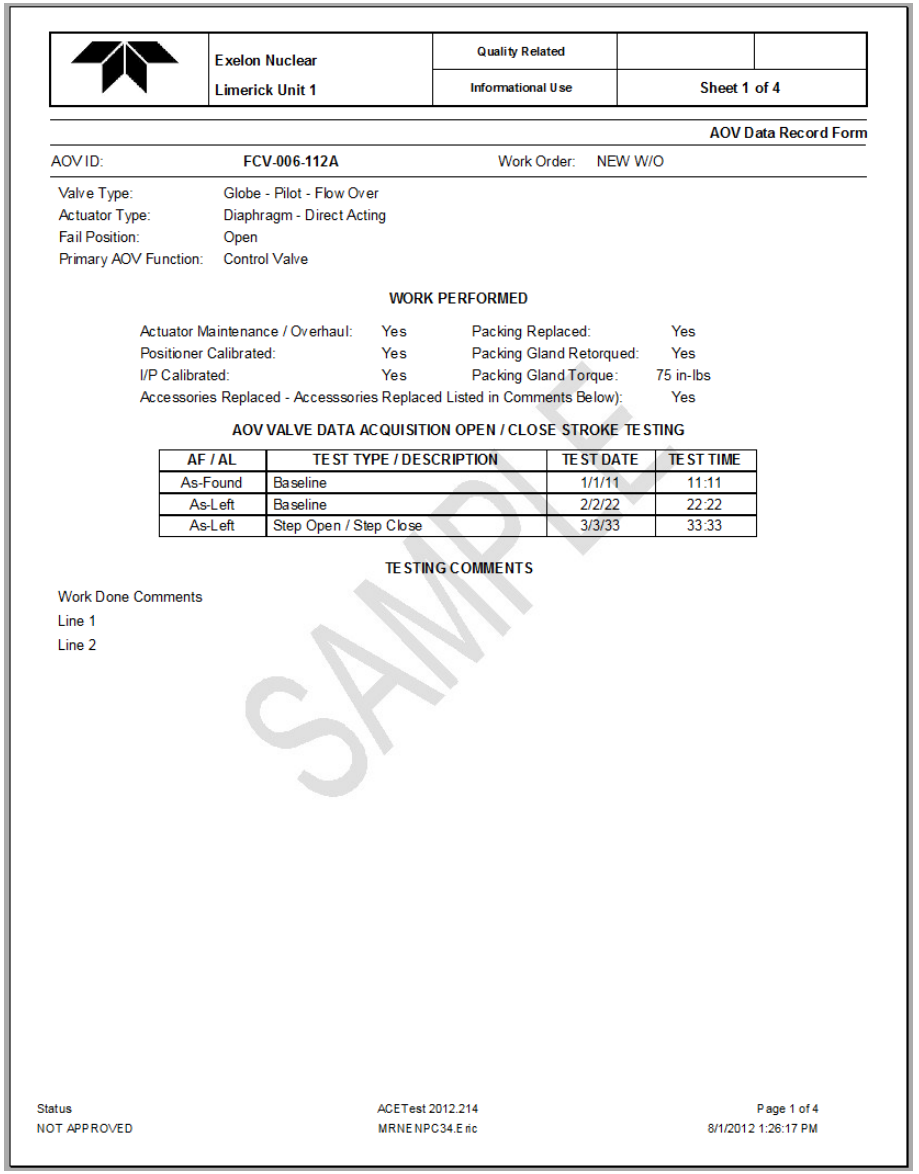
# ACETest Basics

- **Post Test Evaluation**
  - **Test Log**



# ACETest Basics

- Post Test Report
  - Work Performed
  - Test Log
  - Comments



| Exelon Nuclear<br>Limerick Unit 1 | Quality Related<br>Informational Use | Sheet 1 of 4 |
|---|---|---|

AOV Data Record Form

AOV ID: FCV-006-112A Work Order: NEW W/O

Valve Type: Globe - Pilot - Flow Over
Actuator Type: Diaphragm - Direct Acting
Fail Position: Open
Primary AOV Function: Control Valve

WORK PERFORMED

| | | | |
|---|---|---|---|
| Actuator Maintenance / Overhaul: | Yes | Packing Replaced: | Yes |
| Positioner Calibrated: | Yes | Packing Gland Retorqued: | Yes |
| I/P Calibrated: | Yes | Packing Gland Torque: | 75 in-lbs |
| Accessories Replaced - Accesssories Replaced Listed in Comments Below): | | | Yes |

AOV VALVE DATA ACQUISITION OPEN / CLOSE STROKE TESTING

| AF / AL | TEST TYPE / DESCRIPTION | TEST DATE | TEST TIME |
|---|---|---|---|
| As-Found | Baseline | 1/1/11 | 11:11 |
| As-Left | Baseline | 2/2/22 | 22:22 |
| As-Left | Step Open / Step Close | 3/3/33 | 33:33 |

TESTING COMMENTS

Work Done Comments
Line 1
Line 2

SAMPLE

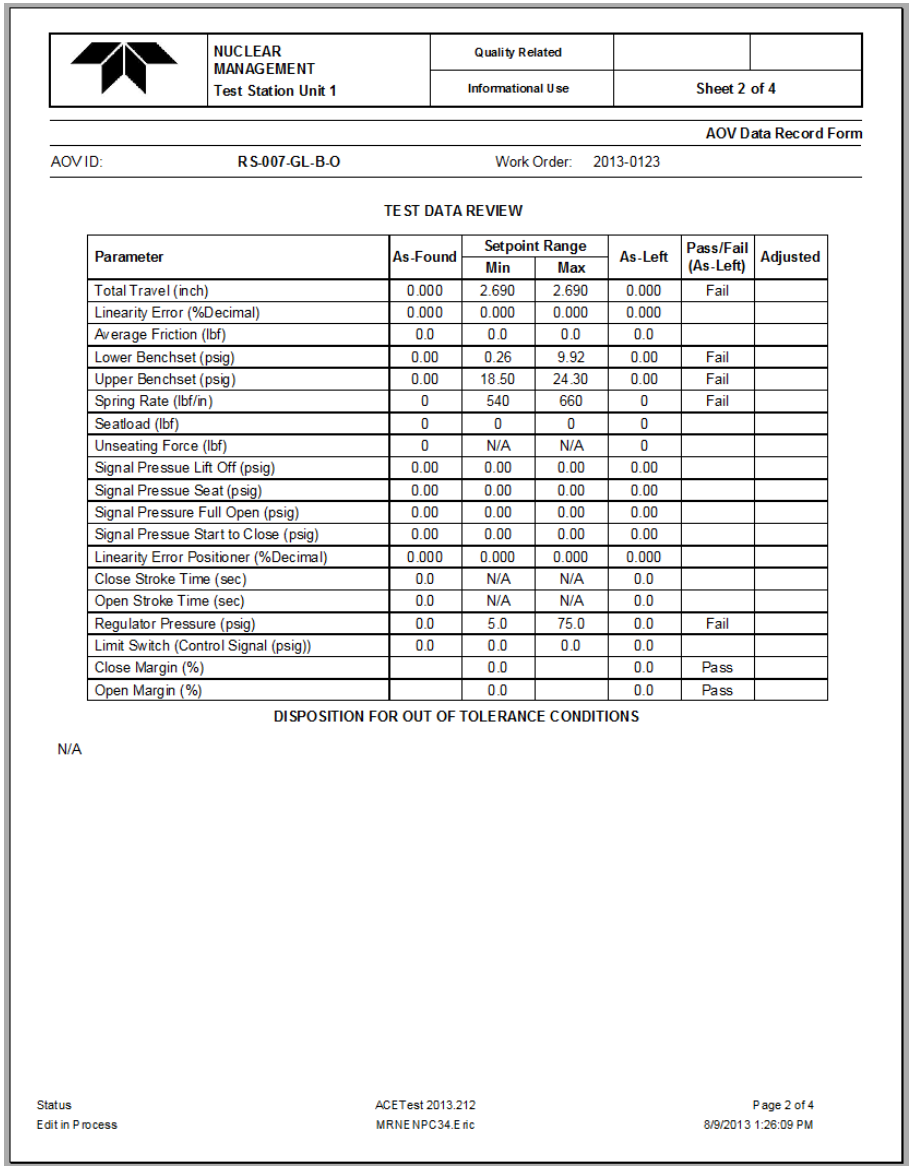
Status
NOT APPROVED

ACETest 2012.214
MRNENPC34.Eric

Page 1 of 4
8/1/2012 1:26:17 PM

# ACETest Basics

- **Post Test Report**
  - **Summary**



| | NUCLEAR MANAGEMENT<br>Test Station Unit 1 | Quality Related | | |
|---|---|---|---|---|
| | | Informational Use | Sheet 2 of 4 | |

AOV Data Record Form

AOV ID: RS-007-GL-B-O Work Order: 2013-0123

TEST DATA REVIEW

| Parameter | As-Found | Setpoint Range | | As-Left | Pass/Fail (As-Left) | Adjusted |
|---|---|---|---|---|---|---|
| | | Min | Max | | | |
| Total Travel (inch) | 0.000 | 2.690 | 2.690 | 0.000 | Fail | |
| Linearity Error (%Decimal) | 0.000 | 0.000 | 0.000 | 0.000 | | |
| Average Friction (lbf) | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Lower Benchset (psig) | 0.00 | 0.26 | 9.92 | 0.00 | Fail | |
| Upper Benchset (psig) | 0.00 | 18.50 | 24.30 | 0.00 | Fail | |
| Spring Rate (lbf/in) | 0 | 540 | 660 | 0 | Fail | |
| Seatload (lbf) | 0 | 0 | 0 | 0 | | |
| Unseating Force (lbf) | 0 | N/A | N/A | 0 | | |
| Signal Pressue Lift Off (psig) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| Signal Pressue Seat (psig) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| Signal Pressure Full Open (psig) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| Signal Pressue Start to Close (psig) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| Linearity Error Positioner (%Decimal) | 0.000 | 0.000 | 0.000 | 0.000 | | |
| Close Stroke Time (sec) | 0.0 | N/A | N/A | 0.0 | | |
| Open Stroke Time (sec) | 0.0 | N/A | N/A | 0.0 | | |
| Regulator Pressure (psig) | 0.0 | 5.0 | 75.0 | 0.0 | Fail | |
| Limit Switch (Control Signal (psig)) | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Close Margin (%) | | 0.0 | | 0.0 | Pass | |
| Open Margin (%) | | 0.0 | | 0.0 | Pass | |

DISPOSITION FOR OUT OF TOLERANCE CONDITIONS

N/A

Status
Edit in Process

ACETest 2013.212
MRNE NPC34.Eric

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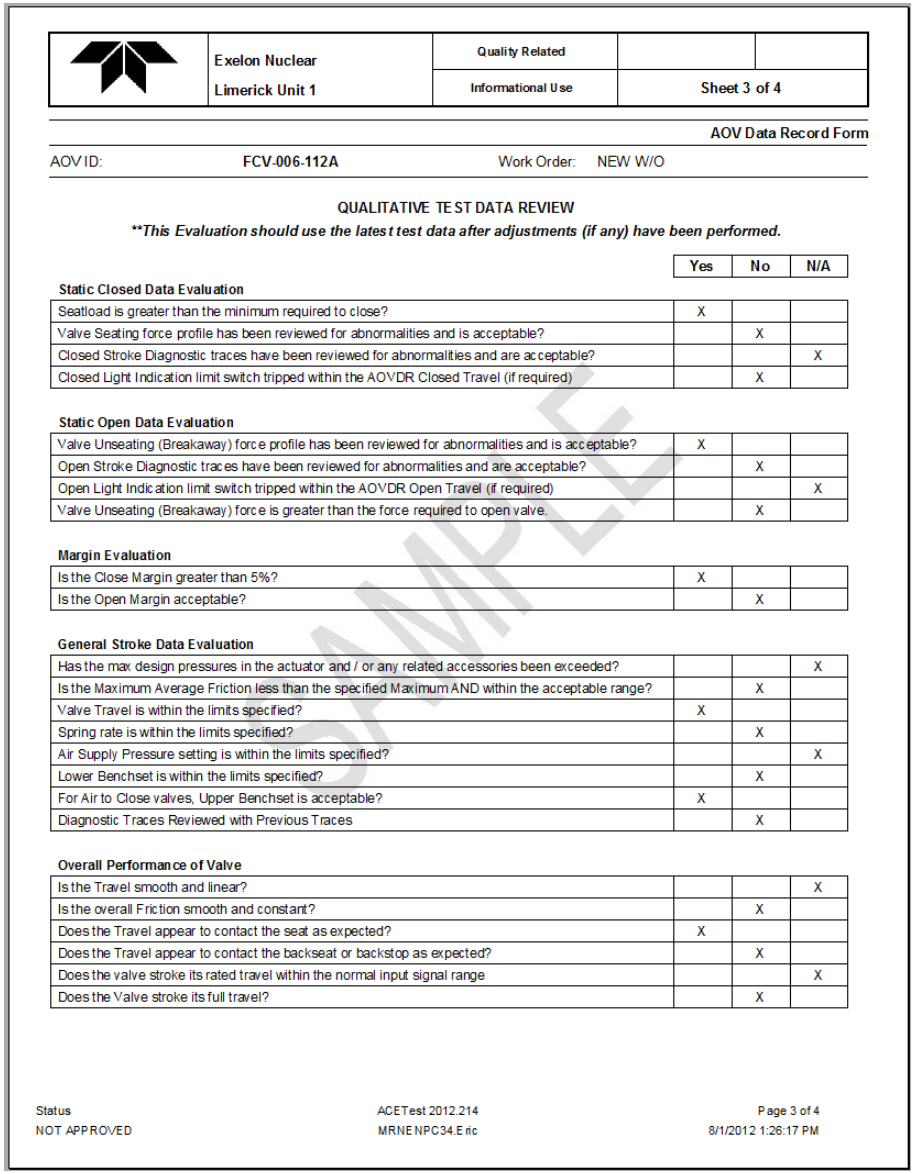
# ACETest Basics

- **Post Test Report**
  - **Evaluation**



| Exelon Nuclear<br>Limerick Unit 1 | Quality Related<br>Informational Use | Sheet 3 of 4 |
|---|---|---|

AOV Data Record Form

AOV ID: FCV-006-112A Work Order: NEW W/O

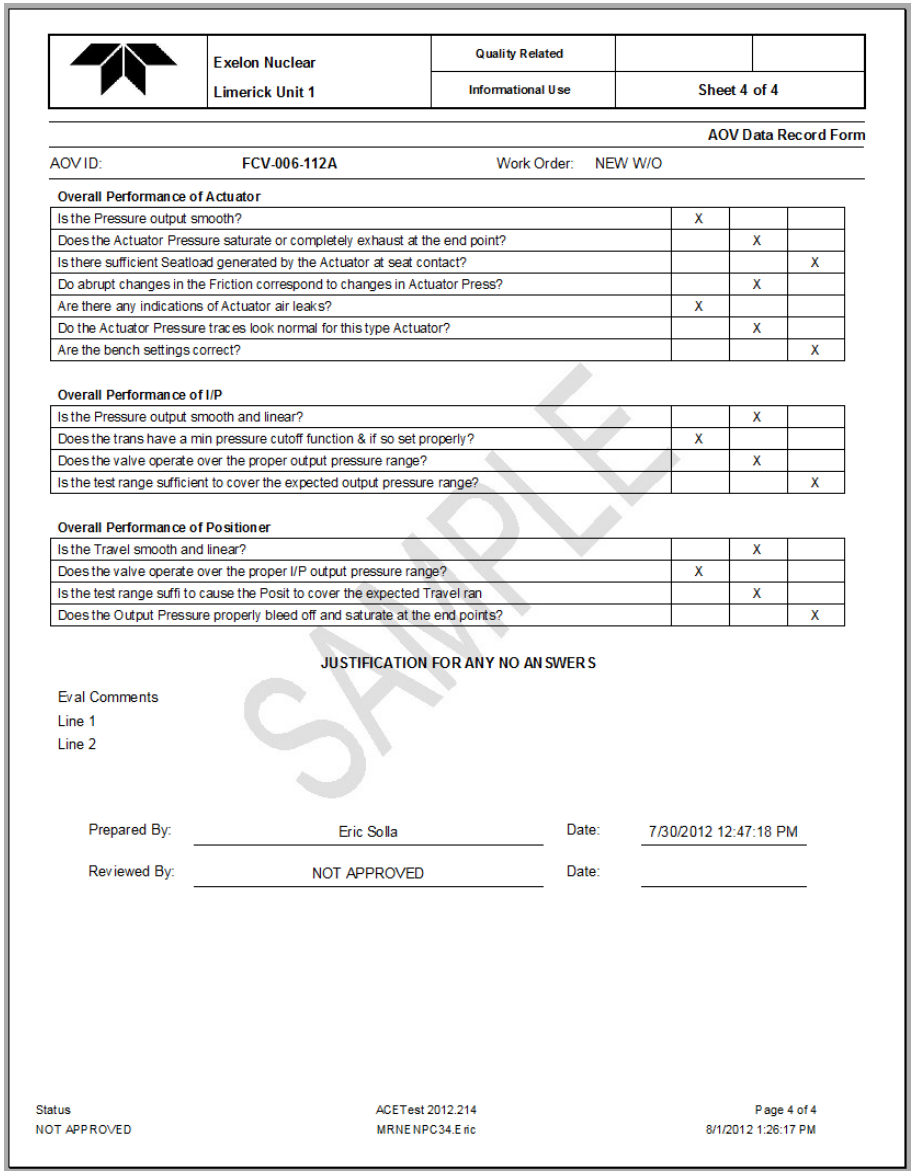
QUALITATIVE TEST DATA REVIEW

***This Evaluation should use the latest test data after adjustments (if any) have been performed.*

| | Yes | No | N/A |
|---|---|---|---|
| **Static Closed Data Evaluation** | | | |
| Seatload is greater than the minimum required to close? | X | | |
| Valve Seating force profile has been reviewed for abnormalities and is acceptable? | | X | |
| Closed Stroke Diagnostic traces have been reviewed for abnormalities and are acceptable? | | | X |
| Closed Light Indication limit switch tripped within the AOVDR Closed Travel (if required) | | X | |
| **Static Open Data Evaluation** | | | |
| Valve Unseating (Breakaway) force profile has been reviewed for abnormalities and is acceptable? | X | | |
| Open Stroke Diagnostic traces have been reviewed for abnormalities and are acceptable? | | X | |
| Open Light Indication limit switch tripped within the AOVDR Open Travel (if required) | | | X |
| Valve Unseating (Breakaway) force is greater than the force required to open valve. | | X | |
| **Margin Evaluation** | | | |
| Is the Close Margin greater than 5%? | X | | |
| Is the Open Margin acceptable? | | X | |
| **General Stroke Data Evaluation** | | | |
| Has the max design pressures in the actuator and / or any related accessories been exceeded? | | | X |
| Is the Maximum Average Friction less than the specified Maximum AND within the acceptable range? | | X | |
| Valve Travel is within the limits specified? | X | | |
| Spring rate is within the limits specified? | | X | |
| Air Supply Pressure setting is within the limits specified? | | | X |
| Lower Benchset is within the limits specified? | | X | |
| For Air to Close valves, Upper Benchset is acceptable? | X | | |
| Diagnostic Traces Reviewed with Previous Traces | | X | |
| **Overall Performance of Valve** | | | |
| Is the Travel smooth and linear? | | | X |
| Is the overall Friction smooth and constant? | | X | |
| Does the Travel appear to contact the seat as expected? | X | | |
| Does the Travel appear to contact the backseat or backstop as expected? | | X | |
| Does the valve stroke its rated travel within the normal input signal range | | | X |
| Does the Valve stroke its full travel? | | X | |

# ACETest Basics

- Post Test Report
  - Evaluation (cont)
  - Comments
  - Signoffs



| Exelon Nuclear<br>Limerick Unit 1 | Quality Related<br>Informational Use | Sheet 4 of 4 |
|---|---|---|

**AOV Data Record Form**

AOV ID: **FCV-006-112A** Work Order: NEW W/O

**Overall Performance of Actuator**

| | | | |
|---|---|---|---|
| Is the Pressure output smooth? | X | | |
| Does the Actuator Pressure saturate or completely exhaust at the end point? | | X | |
| Is there sufficient Seatload generated by the Actuator at seat contact? | | | X |
| Do abrupt changes in the Friction correspond to changes in Actuator Press? | | X | |
| Are there any indications of Actuator air leaks? | X | | |
| Do the Actuator Pressure traces look normal for this type Actuator? | | X | |
| Are the bench settings correct? | | | X |

**Overall Performance of I/P**

| | | | |
|---|---|---|---|
| Is the Pressure output smooth and linear? | | X | |
| Does the trans have a min pressure cutoff function & if so set properly? | X | | |
| Does the valve operate over the proper output pressure range? | | X | |
| Is the test range sufficient to cover the expected output pressure range? | | | X |

**Overall Performance of Positioner**

| | | | |
|---|---|---|---|
| Is the Travel smooth and linear? | | X | |
| Does the valve operate over the proper I/P output pressure range? | X | | |
| Is the test range suffi to cause the Posit to cover the expected Travel ran | | X | |
| Does the Output Pressure properly bleed off and saturate at the end points? | | | X |

**JUSTIFICATION FOR ANY NO ANSWERS**

Eval Comments
Line 1
Line 2

Prepared By: Eric Solla Date: 7/30/2012 12:47:18 PM

Reviewed By: NOT APPROVED Date:

SAMPLE

Status
NOT APPROVED

ACETest 2012.214
MRNENPC34.Eric

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# ACETest Software

*Thank you*

***USER FEEDBACK?***