



TELEDYNE TEST SERVICES
Everywhereyoulook™

Valve Diagnostic Testing and Maintenance

QUIKLOOK USER GROUP

QUG 7 Meeting

August 14 & 15th, 2013

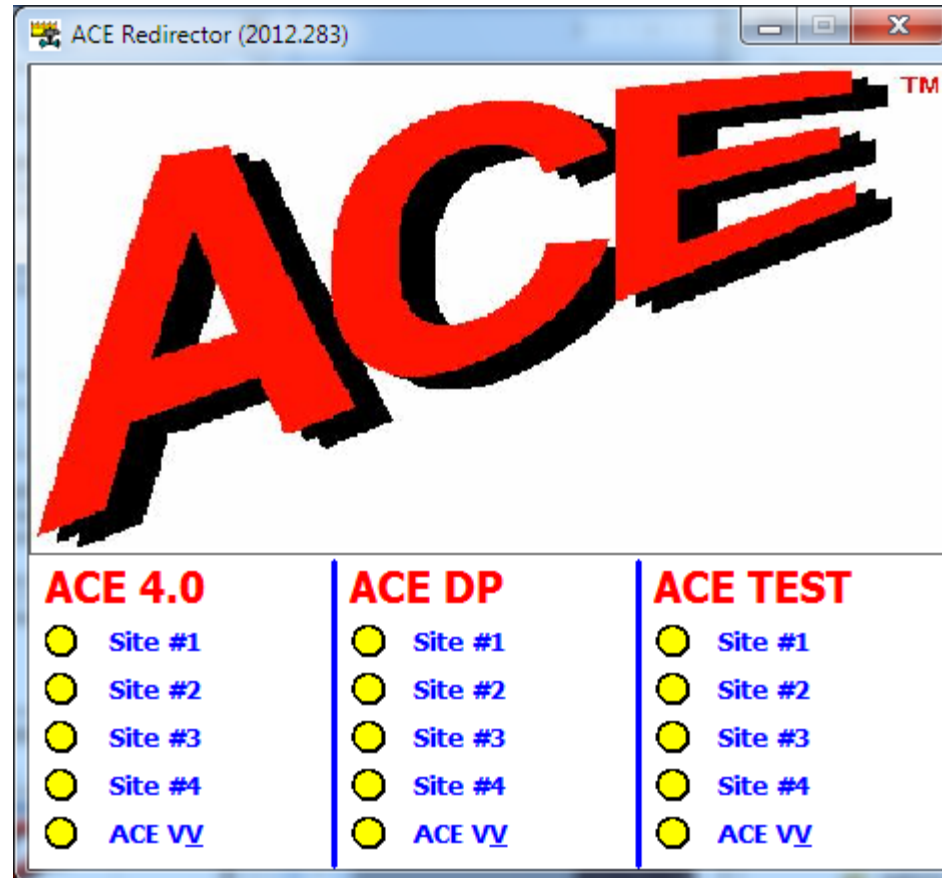


Presented by: **Eric Solla**



TELEDYNE TEST SERVICES
Everywhereyoulook™
Valve Diagnostic Testing and Maintenance

ACE Test Software





Integrated

Design Calculation Software ACE

Test Analysis Software ACETEST

ACE Calculations

File Edits Tables References Tools Help

ZZ-RSTESTCASE **Globe - Balanced - Flow Over - Down to Close**
Diaphragm - Reverse Acting

Packing Accessories Adjustment Factors Output
 Configuration Valve Actuator

Parameter	Dir	Value	Ref
Calculation Number		Unknown	1
Calculation Revision		0	1
System		011	959
Name		Name	970
Fail Position		Close	981
Media		Water	992
Flow Diagram / P&ID		P&ID	993
Max. Fluid Temperature (Deg F)		100	948
Line Pressure Upstream (psig)	(C)	200.00	970
Line Pressure Upstream (psig)	(D)	100.00	970
Line Pressure Downstream (psig)	(C)	20.00	992
Line Pressure Downstream (psig)	(D)	10.00	981
Category		1	993
Air System Name		Air System	948
Stem Material		Stainless Steel	1
Young's Modulus (E)		29,000,000	1
Poisson's Ratio (v)		0.290	1

General Comments
 Discussion on the method used to determine the line pressures. - LP Discussion

Eric Solla 10/10/2011 19:09 NOT APPROVED N/A

ACETest for All Plants - ALL VALVES

File Tables Tools Help

BFN-1-PCV-001-0153 **Globe - Balanced - Flow Over - Down to Close**
Diaphragm - Reverse Acting

Design Data - Manual Input

FUNCTION	OPEN	Last Edit	SIGNOFF	Last Signoff	PRINT
Pre-Test		11/13/12 13:56		N/A	
Post Test Evaluation		11/13/12 13:58		N/A	

Add New Work Order

Work Order	AOVDR Rev	Status	Test Date	Test of Record
112585928	0	PreTest	11/10/2012	...
N/A	N/A	Legacy	11/11/2010	...

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

The screenshot shows a dialog box titled "Add New Valve" with a close button (X) in the top right corner. The dialog contains the following fields and controls:

- Valve ID:** A text input field.
- Work Order:** A text input field containing "NEW W/O".
- Legacy Data:** A checkbox that is currently unchecked.
- AOVDR Rev:** A text input field containing "0".
- Plant/Unit:** A dropdown menu showing "Browns Ferry Unit 1".
- Buttons:** "OK" and "Cancel" buttons at the bottom.

Text inside the dialog: "This feature adds a new valve using default values. Enter the new valve and plant/unit below."

ACETest Basics

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

ACETest for All Plants - ALL VALVES

File Tables Tools Help

BFF Add New Work Order

Des

Work Order Legacy Data AOVD Rev

NEW W/O 1

FU

Select the work order as the basis for the new Test Instructions

Work Order	AOVD Rev	Test Date	Test of Record
???????	0	11/1/2012	...

OK Cancel

Add New Work Order

Work Order	AOVD Rev	Status	Test Date	Test of Record
???????	0	PreTest	11/1/2012	...
N/A	N/A	Legacy	11/1/2010	...

ACETest Basics

- Pre-Test Inputs
 - Similar layout to ACE

Parameter	Dir	Value
Description		MSL Downstream drain line header
Misc References		DBR
Primary ADV Function		Control Valve
ADVDR Revision		2
ADVDR Status		Pending / 1st Time
IST		No
LLRT		No
Thermal Perf		No
SOV Limit IP EQ		N/A

General Notes Tab 0

Eric Solla 7/26/2012 9:33:16 AM NOT APPROVED

ACETest Basics

- Design Inputs
 - Imported from ACE

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

Print Return Show All Flag ▲

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

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
Spring Preload (Maximum)	125	N/A	0	X

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

ACETest Basics

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

Parameter	Dir	Value
System		N/A
Failure Mode		Open
ADV Category		1
Flow Diagram / P&ID		N/A
Calculation Reference		Unknown
Calc Reference Rev		0
Description		N/A
Misc References		N/A
Primary ADV Function		N/A
ADVDR Revision		0
ADVDR Status		Pending
IST		Yes
LLRT		No
Thermal Perf		No
SOV Limit IP EQ		Yes

N/A

Eric Solla 7/25/2012 4:04:26 PM NOT APPROVED

ACETest Basics

- Pre-Test Inputs
 - Valve Tab

The screenshot shows the 'Pre-Test Setup for FCV-006-112A' window. The 'Valve' tab is selected under the 'Adjustment Factors' section. The window contains a table of parameters and their values, along with a 'Valve Notes' field at the bottom.

Parameter	Dir	Value
Valve Drawing		Dwg ###
Nominal Stroke Tolerance (%Decimal)		0.0100
Min Required Seat Load Remarks	(C)	Close Min Comment
Min Required Seat Load Remarks	(O)	Open Min Comment
Max Allowable Thrust Remarks	(C)	Close Max Comment
Max Allowable Thrust Remarks	(O)	Open Max Comment
Calculate Open Force Settings		Yes
Include Detailed Seat Load Calc in Report		Yes
Desired Friction Range - Minimum		100.0
Desired Friction Range - Maximum		140.0

Valve Notes Tab 2

Eric Solla 8/8/2012 10:52:25 AM NOT APPROVED

ACETest Basics

- Pre-Test Inputs
 - Actuator Tab

The screenshot displays the 'Pre-Test Setup for FCV-006-112A' window. The interface includes a menu bar with 'Print', 'Edits', 'Tables', 'Return', and 'Help'. Below the menu bar are three tabs: 'Accessories', 'Adjustment Factors', and 'Test Requirements'. The 'Test Requirements' tab is active, and within it, the 'Actuator' sub-tab is selected. The main area contains a table with the following data:

Parameter	Dir	Value
Actuator Drawing		Act Dwg ###
Stoke Time Adjustable (Needle) Valve		Yes
Handwheel Mounting		Top
Hide Setup Window		No
Minimum Lower Bench Set - Target		2.00
Maximum Lower Bench Set - Target		3.50
Lower Bench Set - Target		2.75
Lower Bench Set - Remarks		LBS Comment
Upper Bench Set - Target		15.00
Upper Bench Set - Remarks		UBS Comment

Below the table is a text area labeled 'Actuator Notes Tab 3'. At the bottom of the window, a status bar shows the user 'Eric Solla', the date and time '8/8/2012 10:52:25 AM', and the status 'NOT APPROVED'.

ACETest Basics

- Accessories
 - Imported from ACE
 - Additional Fields added

Pre-Test Setup for FCV-006-112A

Print Edits Tables Return Help

General Valve Actuator

Accessories Adjustment Factors Test Requirements

Positioner SOV I/P

Accumulator Air Regulator Booster Limit Switch

Add Air Regulator Delete Air Regulator

Parameter	Dir	Value
Equipment ID		Air Regulator 2
Manufacturer		Air reg Manuf
Model Number		Air reg Model
Shop Order Number		Air Reg Shop Order No
Serial Number		Air Reg SN
Current Air Regulator Setting (psig)		48.00
Maximum Rated Pressure (psig)		125.0
Air Pressure Min (psig)		42.00
Air Pressure Max (psig)		52.00
Air Pressure Target (psig)		47.00
Input Pressure (psig)		100.0
Supplies		Booster

Air Regulator Notes Tab 6

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ACETest Basics

- Accessories
 - I/P Added

Pre-Test Setup for RS-007-GL-B-O

Print Edits Tables Return Help

General Valve Actuator

Accessories Adjustment Factors Test Requirements

Accumulator Air Regulator Booster Limit Switch

Positioner SOV I/P

Add I/P Delete I/P

Parameter	Dir	Value
Equipment ID		I/P
Manufacturer		N/A
Model Number		N/A
Shop Order Number		N/A
Serial Number		N/A
Action		N/A
I/P Input Signal		N/A
I/P Output Signal		N/A
Minimum Signal I/P - Min (psig)		0.0
Minimum Signal I/P - Max (psig)		0.0
Maximum Signal I/P - Min (psig)		0.0
Maximum Signal I/P - Max (psig)		0.0
Linearity Error I/P - Min (%Decimal)		0.000
Linearity Error I/P - Max (%Decimal)		0.000

N/A

Rich Enos 2/10/2013 8:55:35 AM NOT APPROVED

ACETest Basics

- Adjustment Factors
 - Not same as ACE

Pre-Test Setup for FCV-006-112A

Print Edits Tables Return Help

General Valve Actuator

Accessories Adjustment Factors Test Requirements

Parameter	Dir	Value
Acquisition Module Reading Accuracy (%Decimal)		0.0100
Acquisition Module Full Scale Accuracy (%Decimal)		0.0000
Pressure Transducer		Pressure Transducer Model #
Pressure Trans Full Scale Reading		100.00
Pressure Transducer Reading Accuracy (%Decimal)		0.0100
Pressure Transducer Full Scale Accuracy (%Decimal)		0.0000
Recommended Device to Acquire Thrust		EDA
Thrust Device Full Scale Reading		5,000.00
Tq / Th Device Reading Accuracy (%Decimal)		0.0800
Tq / Th Device Full Scale Accuracy (%Decimal)		0.0000
PreAmp Reading Accuracy (%Decimal)		0.0100
PreAmp Full Scale Accuracy (%Decimal)		0.0000

Adjustment Factor Notes

Eric Solla 8/1/2012 10:00:22 AM NOT APPROVED

ACETest Basics

- Test Requirements

The screenshot shows the 'Pre-Test Setup for RS-007-GL-B-O' window. The 'Test Requirements' tab is active, displaying a table of parameters and their values. The table has three columns: 'Parameter', 'Dir', and 'Value'. The 'Dir' column is currently empty for all rows. The 'Value' column contains various values including 'N/A', 'No', and '0.0'. Below the table is a text area containing 'N/A'. The status bar at the bottom shows 'Rich Enos', '2/10/2013 8:55:35 AM', and 'NOT APPROVED'.

Parameter	Dir	Value
Reason for Diagnostic Test		N/A
As Found Testing Required		No
Baseline Test		No
As Found LLRT Required		No
Actuator Maintenance Required		No
Accessory Maint / Calibration		No
Packing Adjustment Required		No
Control Room Stroke Time Required		No
Minimum Close Stroke Time		0.0
Maximum Close Stroke Time		0.0
Minimum Open Stroke Time		0.0
Maximum Open Stroke Time		0.0
Strain Gauge for Thrust Data		No
Use Installed IP		N/A
High Pressure IP Used		No
Test Ramp Time		0
Close Margin (%)		0.0
Open Margin (%)		0.0

N/A

Rich Enos 2/10/2013 8:55:35 AM NOT APPROVED

ACETest Basics

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

Device to Acquire Thrust: QSS

Thrust Device Full Scale Reading: 0.00

Accuracies

Acquisition Module Reading: 0.0000 % Decimal

Acquisition Module Full Scale: 0.0000 % Decimal

Tq / Th Device Reading: 0.0000 % Decimal

Tq / Th Device Full Scale: 0.0000 % Decimal

PreAmp Reading: 0.0000 % Decimal

PreAmp Full Scale: 0.0000 % Decimal

	Close	Open
Min. Required Thrust:	1,754 lbf	629 lbf
Max Average Friction:	500 lbf	500 lbf
Desired Thrust Limit (Seat Load Only):	1,254 lbf	129 lbf
Min Required Seat Load:	1,254 lbf	129 lbf
Remark (N/A if Not Applicable)	N/A	N/A
Max Actuator Rating (Weak Link):	12,000 lbf	11,000 lbf
Adjusted Max Allowable Thrust:	12,000 lbf	11,000 lbf
Remark (N/A if Not Applicable)	N/A	N/A

Include Detailed Seat Load Calc in Report Calculate Open Force Settings

ACETest Basics

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

Edit Accuracies - Seat Load - RS-007-GL-B-O

Edits Print Return

Device to Acquire Thrust: EDA

Fail Mode: Close

Act Eff Area @ Seating: 78.10 sq in

Act Eff Area @ Seating Tol: 0.00000 % Decimal

Pressure Transducer: N/A

Pres Trans Full Scale Reading: 0.00 psig

Accuracies

Acquisition Module Reading: 0.00000 % Decimal

Acquisition Module Full Scale: 0.00000 % Decimal

Pressure Transducer Reading: 0.00000 % Decimal

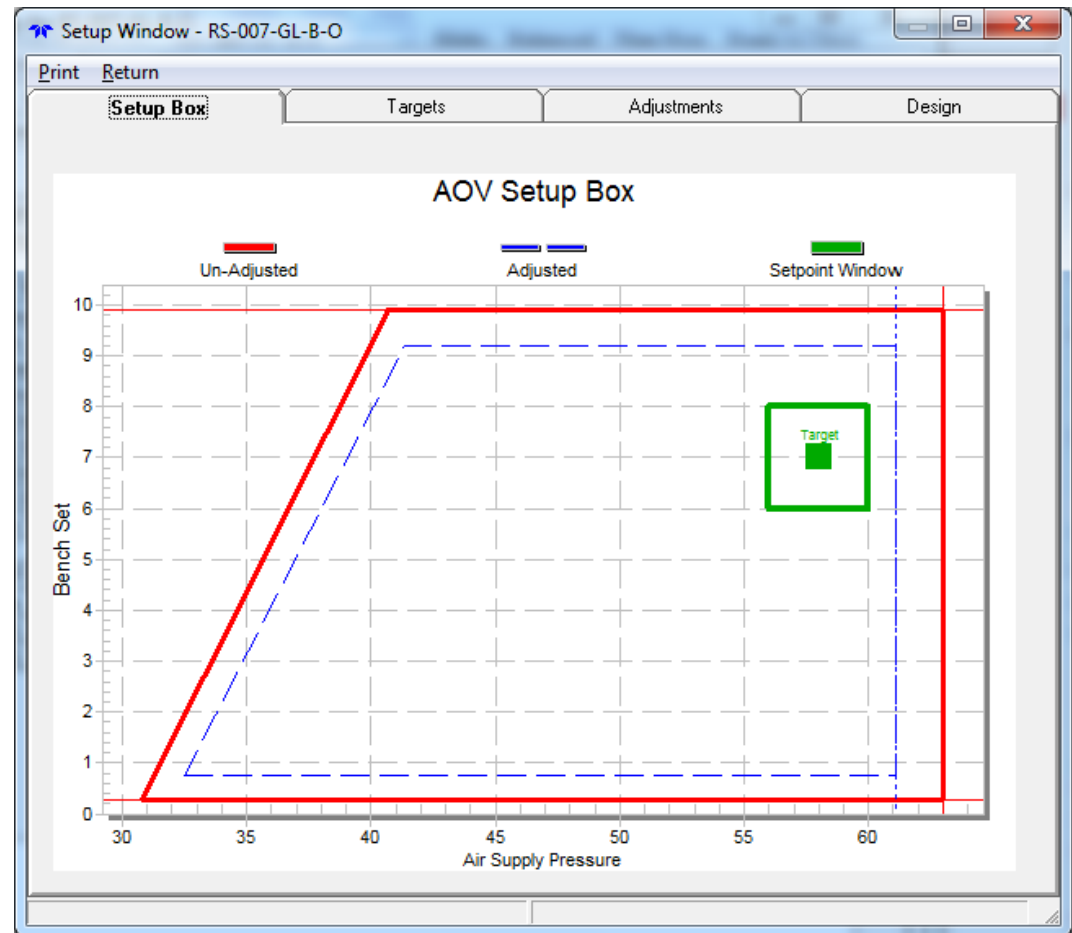
Pressure Transducer Full Scale: 0.00000 % Decimal

	Close	Open
Min. Required Thrust:	1,754 lbf	629 lbf
Max Average Friction:	500 lbf	500 lbf
Desired Thrust Limit (Seat Load Only):	1,254 lbf	129 lbf
Min Required Seat Load:	1,254 lbf	129 lbf
Remark (N/A if Not Applicable):	N/A	N/A
Max Actuator Rating (Weak Link):	12,000 lbf	11,000 lbf
Adjusted Max Allowable Thrust:	12,000 lbf	11,000 lbf
Remark (N/A if Not Applicable):	N/A	N/A

Include Detailed Seat Load Calc in Report Calculate Open Force Settings

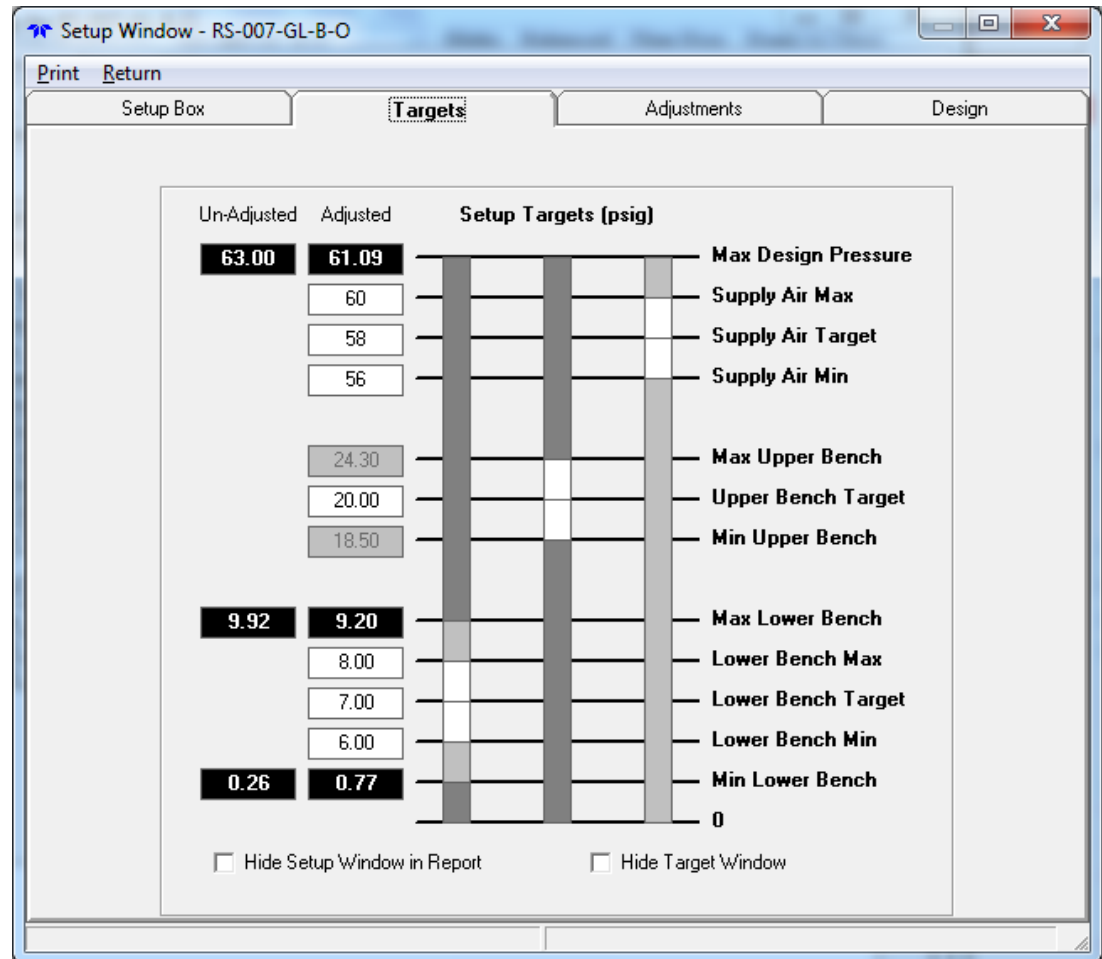
ACETest Basics

- AOV Setup Box



ACETest Basics

- AOV Setup Box Targets



ACETest Basics

- AOV Setup Box Adjustments

Setup Window - RS-007-GL-B-O

Print Return

Setup Box Targets **Adjustments** Design

Transducer

Pressure Transducer: N/A

Pres Trans Full Scale Reading: 100.00 psig

Accuracies

Acquisition Module Reading: 0.0200 % Decimal

Acquisition Module Full Scale: 0.0050 % Decimal

Pressure Transducer Reading: 0.0100 % Decimal

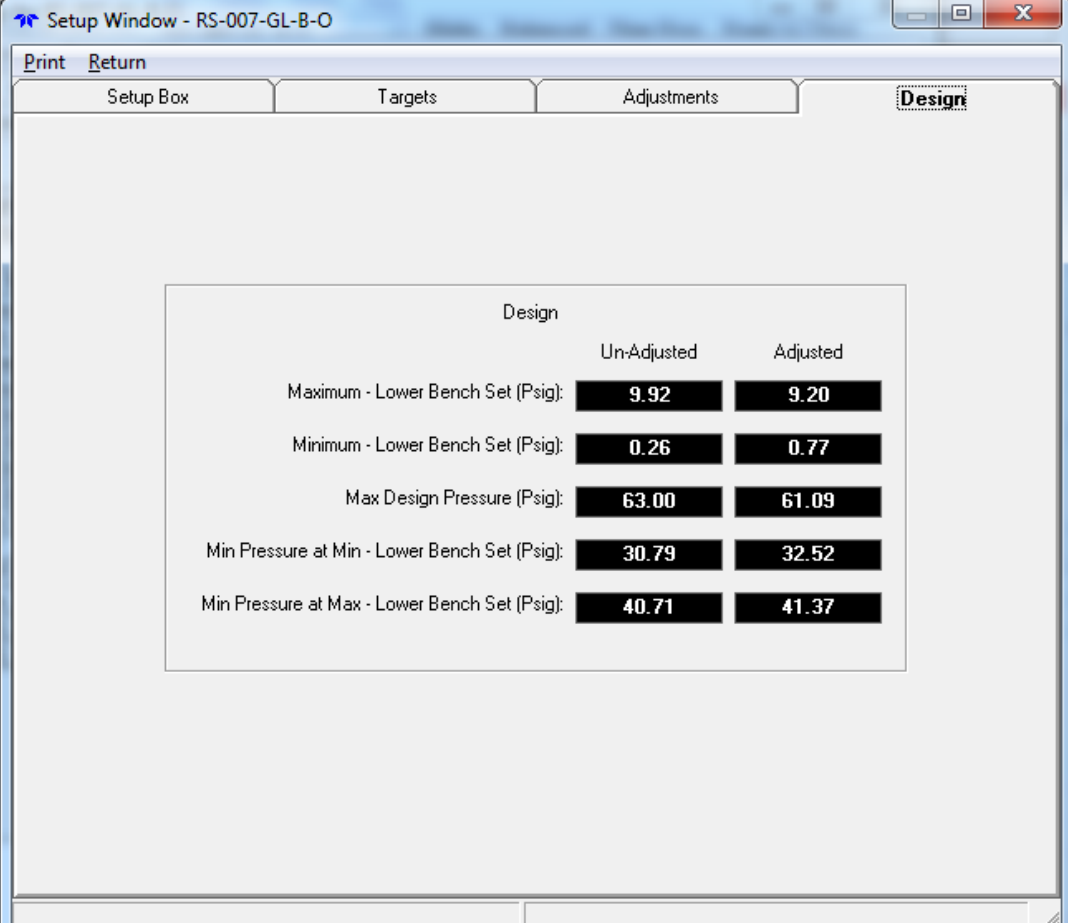
Pressure Transducer Full Scale: 0.0000 % Decimal

Combined Accuracy Reading: **0.0224** % Decimal

Combined Accuracy Full Scale: **0.0050** % Decimal

ACETest Basics

- **AOV Setup Box**
Design Calculated Outputs



The screenshot shows a software window titled "Setup Window - RS-007-GL-B-O". It has a menu bar with "Print" and "Return". Below the menu bar are three tabs: "Setup Box", "Targets", and "Adjustments". The "Design" tab is active, and a "Design" button is visible in the top right corner. The main content area displays a table of design outputs.

Design		
	Un-Adjusted	Adjusted
Maximum - Lower Bench Set (Psig):	9.92	9.20
Minimum - Lower Bench Set (Psig):	0.26	0.77
Max Design Pressure (Psig):	63.00	61.09
Min Pressure at Min - Lower Bench Set (Psig):	30.79	32.52
Min Pressure at Max - Lower Bench Set (Psig):	40.71	41.37

ACETest Basics

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


Edit Set Points - RS-007-GL-B-O

Edits Print Return

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 Pressure Lift Off (psig)		0.00	0.00	0.00	
Signal Pressure Seat (psig)		0.00		0.00	
Signal Pressure Full Open (psig)		0.00		0.00	
Signal Pressure 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	Quality Related	
	Limerick Unit 1	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	IST:	No
Calculation Reference:	TR-00089-1 Rev 0	LLRT:	No
Misc References:	DBR	Thermal Perf:	No
Flow Diagram / P&ID:	94.16162-1	Category:	1
System:	Main Steam	Primary AOV Function:	Control Valve
Description:	MSL Downstream drain line header 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 (ν):	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	Stroke 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		

ACETest Basics

- Pre-Test Report
 - Only Accessories chosen are shown

	NUCLEAR MANAGEMENT Browns Ferry Unit 1	Quality Related	
		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	N/A	
Contacts Close Decrease Pressure	10.0	8.0	14.0		
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	N/A	
Contacts Open Decrease Pressure	10.0	8.0	14.0		
Reset	0.0	0.0	0.0		

ACETest Basics

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

	Exelon Nuclear	Quality Related	
	Limerick Unit 1	Informational Use	Sheet 3 of 4

AOV Data Record Form

AOVID: **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 Req'd:	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

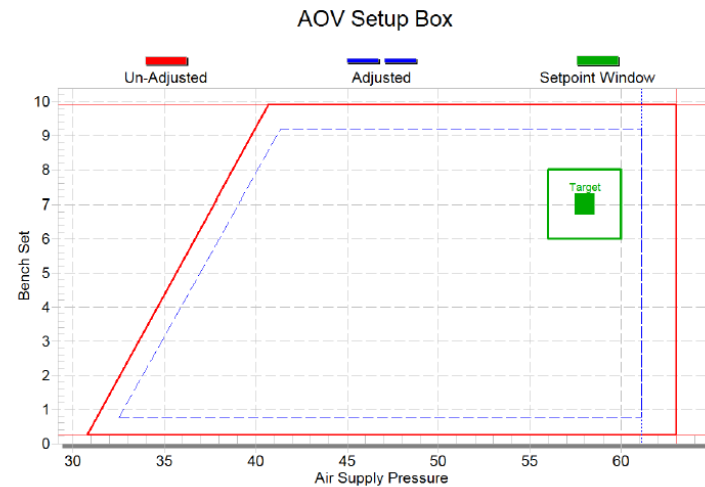
- Pre-Test Report
 - Setup Window
 - Optional

 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



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: _____

ACETest Basics

- Post Test Evaluation
 - Work Done

The screenshot displays the 'ACE Test Evaluation - FCV-006-112A' window. The interface includes a menu bar with 'Import Data', 'Edit', 'Print', and 'Return'. Below the menu is a tabbed interface with four tabs: 'Work Done' (selected), 'Summary', 'Evaluation', and 'Test Log'. The 'Work Done' tab contains the following fields and options:

- Work Order:
- Test of Record
- Date:
- Work Performed**
 - Actuator Maintenance / Overhaul
 - Positioner Calibrated
 - I/P Calibrated
 - Accessories Replaced - (List Accessories Replaced Below in Comments)
 - Packing Replaced
 - Packing Gland Retorqued
- Torque:
- Testing Comments:
 - Work Done Comments
 - Line 1
 - Line 2

The bottom status bar shows: Rev 0 | Eric Solla | 07/30/2012 12:47 | NOT APPROVED

ACETest Basics

- **Post Test Evaluation**

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

ACE Test Evaluation - RS-007-GL-B-O

Import Data Edit Print Return

Work Done Summary Evaluation Test Log

Parameters	As-Found	Min Setpoint	Max Setpoint	As-Left	Pass/Fail [As-Left]	Adjusted
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 Pressure Lift Off (psig)	0.00	0.00	0.00	0.00		
Signal Pressure Seat (psig)	0.00	0.00	0.00	0.00		
Signal Pressure Full Open (psig)	0.00	0.00	0.00	0.00		
Signal Pressure Start to Close (psig)	0.00	0.00	0.00	0.00		
Linearity Error Positioner (%Decimal)	0.000	0.000	0.000	0.000		
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 (%)	N/A	0.0		0.0	Pass	
Open Margin (%)	N/A	0.0		0.0	Pass	

Disposition for Out of Tolerance Condition:
N/A

Rev 0 Eric Solla 07/17/2013 16:47 NOT APPROVED

ACETest Basics

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

ACE Test Evaluation - FCV-006-112A

Import Data Edit Print Return

Work Done Summary **Evaluation** Test Log

	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 AOVDV 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 AOVDV 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	
Justification for Any No Answers:			
Eval Comments			
Line 1			
Line 2			

Rev 0 Eric Solla 07/30/2012 12:47 NOT APPROVED

ACETest Basics

- Post Test Evaluation
 - Test Log


The screenshot displays the 'ACE Test Evaluation - FCV-006-112A' application window. The 'Test Log' tab is active, showing a table of test results. The table has four columns: 'AF / AL', 'Test Type / Description', 'Test Date', and 'Test Time'. There are two data rows and two header rows. Below the table are three buttons: 'Add Test', 'Edit Test', and 'Delete Test'. The status bar at the bottom shows 'Rev 0', 'Eric Solla', '07/30/2012 12:47', and 'NOT APPROVED'.

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
AF / AL	Test Type / Description	Test Date	Test Time
As-Left	Step Open / Step Close	3/3/33	33:33

Rev 0 | Eric Solla | 07/30/2012 12:47 | NOT APPROVED

ACETest Basics

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

	Exelon Nuclear	Quality Related		
	Limerick Unit 1	Informational Use	Sheet 1 of 4	

AOV Data Record Form

AOVID: 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 - Accessories 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 MRNE NPC34.E ric Page 1 of 4 8/1/2012 1:26:17 PM

ACETest Basics

- Post Test Report
 - Summary

	NUCLEAR MANAGEMENT Test Station Unit 1	Quality Related	
		Informational Use	Sheet 2 of 4

AOV Data Record Form

AOVID: 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 Pressure Lift Off (psig)	0.00	0.00	0.00	0.00		
Signal Pressure Seat (psig)	0.00	0.00	0.00	0.00		
Signal Pressure Full Open (psig)	0.00	0.00	0.00	0.00		
Signal Pressure 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

ACETest Basics

- Post Test Report
 - Evaluation

	Exelon Nuclear	Quality Related	
	Limerick Unit 1	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	Quality Related		
	Limerick Unit 1	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: _____



ACETest Software

Thank you

USER FEEDBACK?