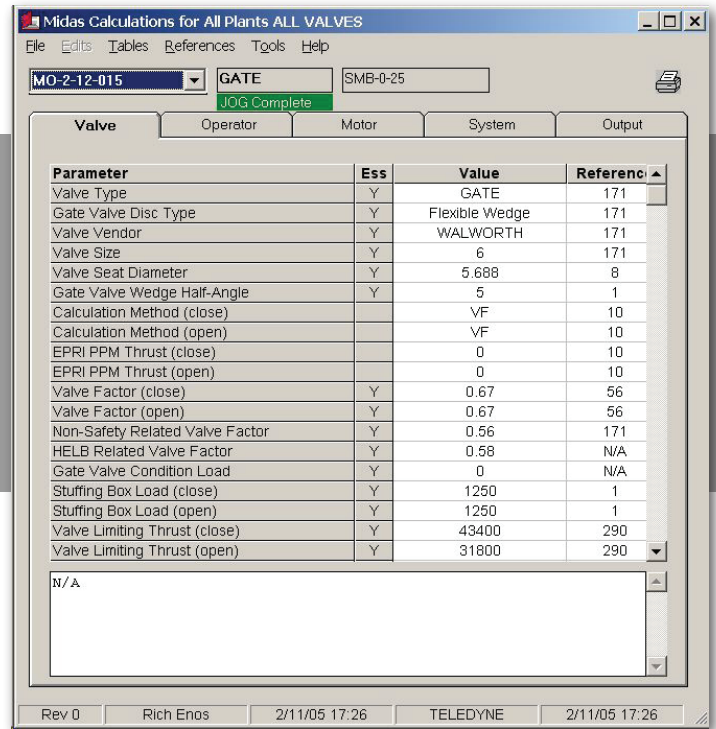


MOV Design & Test Database Software Midas & Midastest

*MIDAS MOV
Design Software*



MIDAS Calculations for All Plants ALL VALVES

MO-2-12-015 GATE SMB-0-25

JOG Complete

Parameter	Ess	Value	Referenc
Valve Type	Y	GATE	171
Gate Valve Disc Type	Y	Flexible Wedge	171
Valve Vendor	Y	WALWORTH	171
Valve Size	Y	6	171
Valve Seat Diameter	Y	5.688	8
Gate Valve Wedge Half-Angle	Y	5	1
Calculation Method (close)		VF	10
Calculation Method (open)		VF	10
EPRI PPM Thrust (close)		0	10
EPRI PPM Thrust (open)		0	10
Valve Factor (close)	Y	0.67	56
Valve Factor (open)	Y	0.67	56
Non-Safety Related Valve Factor	Y	0.56	171
HELB Related Valve Factor	Y	0.58	N/A
Gate Valve Condition Load	Y	0	N/A
Stuffing Box Load (close)	Y	1250	1
Stuffing Box Load (open)	Y	1250	1
Valve Limiting Thrust (close)	Y	43400	290
Valve Limiting Thrust (open)	Y	31800	290

Rev 0 Rich Enos 2/11/05 17:26 TELEDYNE 2/11/05 17:26

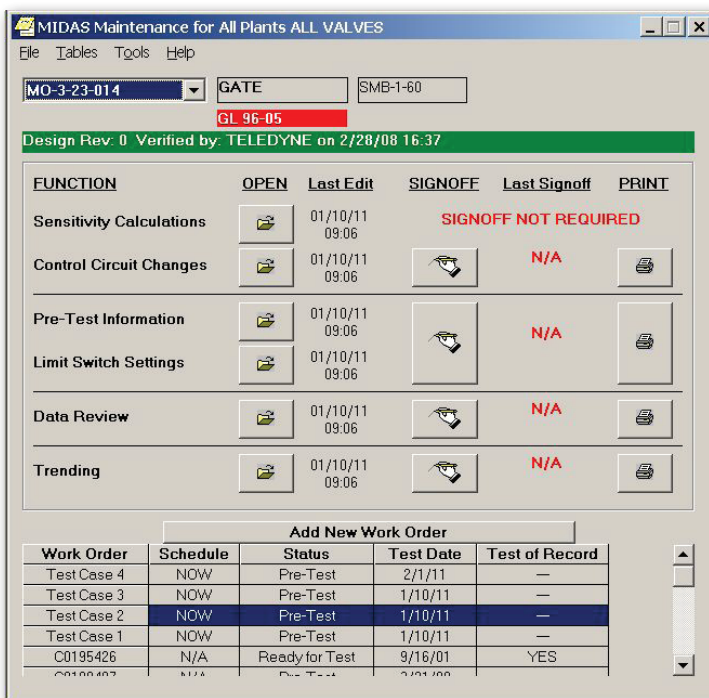
Teledyne Test Services, together with our clients, have developed the most comprehensive MOV Design (MIDAS) and Test (MIDATEST) Databases available to the industry for utility MOV program control.

Many utilities, including Exelon, Entergy, NMC, Progress Energy, First Energy, FPL, PSE&G, and PPL have contracted with TTS to implement this software at their sites.

MIDAS and MIDATEST software are developed, maintained and documented using software Quality procedures developed by Teledyne. MIDAS and MIDATEST are delivered with a Certificate of Conformance attesting to this fact.

Teledyne has developed a client/server implementation for MIDAS and MIDATEST. This allows for a single installation on a server for the entire utility, including all remote sites. Teledyne provides an unlimited usage license for the entire utility.

See white paper 'Utility-wide MOV Database Software Implementation' for an example.



MIDAS Maintenance for All Plants ALL VALVES

MO-3-23-014 GATE SMB-1-60

GL 96-05

Design Rev: 0 Verified by: TELEDYNE on 2/28/08 16:37

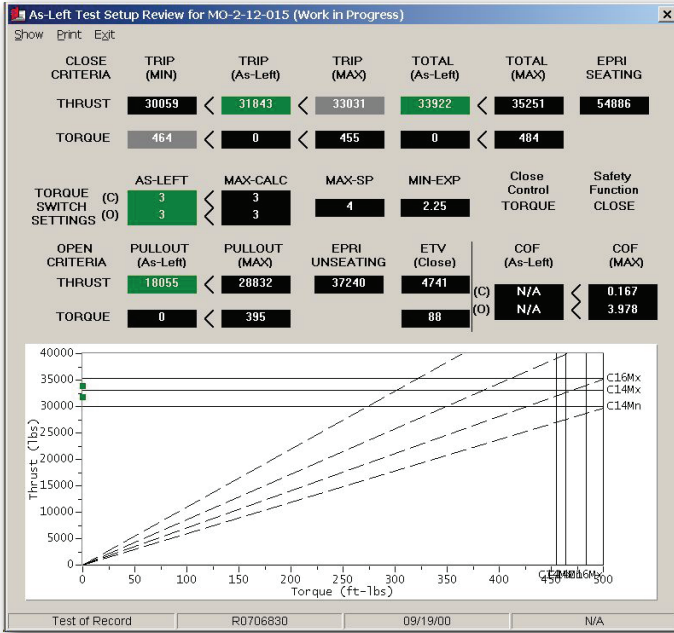
FUNCTION	OPEN	Last Edit	SIGNOFF	Last Signoff	PRINT
Sensitivity Calculations		01/10/11 09:06		SIGNOFF NOT REQUIRED	
Control Circuit Changes		01/10/11 09:06		N/A	
Pre-Test Information		01/10/11 09:06		N/A	
Limit Switch Settings		01/10/11 09:06		N/A	
Data Review		01/10/11 09:06		N/A	
Trending		01/10/11 09:06		N/A	

Add New Work Order

Work Order	Schedule	Status	Test Date	Test of Record
Test Case 4	NOW	Pre-Test	2/1/11	—
Test Case 3	NOW	Pre-Test	1/10/11	—
Test Case 2	NOW	Pre-Test	1/10/11	—
Test Case 1	NOW	Pre-Test	1/10/11	—
C0195426	N/A	Ready for Test	9/16/01	YES

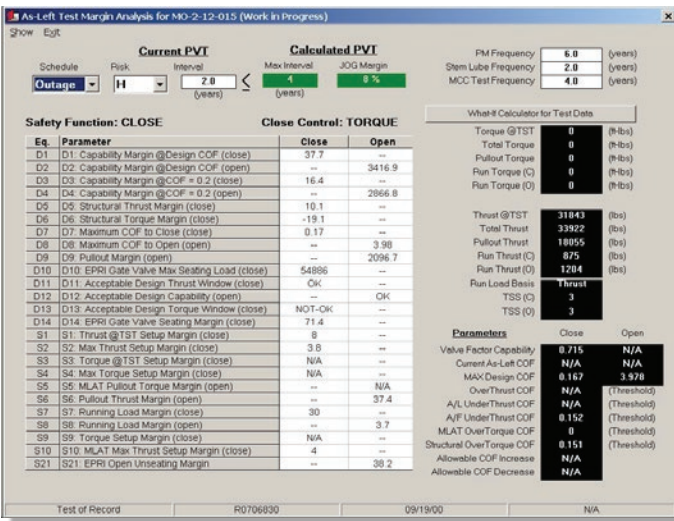
MIDATEST MOV Test Software

MOV Design & Test Database Software



MIDAS is the primary MOV engineering tool for a utility. It provides:

- Thrust/torque set-up window criteria
- Design margins, setup margins, and stem COF analysis
- PVT margin and interval analysis
- What-if margin analysis
- Configuration control
- Stem nut wear methodology
- Powerful export to Excel reporting tool
- Global parameter evaluating tool



Status for MO-2-12-015

Ready For Check

Yes No

Design Change Type

Type 1 - Design Input Change Only

Type 2 - Design Input/Output Change

Type 3 - Configuration Document Change Only

Type 4 - Physical Design Change

Design Change Control

Reason: N/A

Calc: MO-2-12-015

Rev: 0 Existing Rev (0)

MOV Design & Test Database Software

AC Voltage Drop Calculation for MO-2-12-015

Print Exit

Voltage Drop Methodology: **STD**

RELIANCE 25 ft-lbs., 1700 RPM, 460V, (M1480)

Cable Terms

Calculate Input

Cable Resistance	0.361	Cable Reactance	0.018	TOL Resistance	0.20425
------------------	-------	-----------------	-------	----------------	---------

Voltage Divider Terminology (STD)

Power Factor	0.830	Locked Rotor Amps	25.10	Current Loss	0.231000
--------------	-------	-------------------	-------	--------------	----------

	CLOSE SAFETY	OPEN NON-SAFETY	
Ambient Temperature	76.00	76.00	(°C)
Voltage at MCC	427.2	427.2	(Volts)
Motor Impedance	11.181	11.181	(ohms)
Motor Resistance	9.496	9.496	(ohms)
Motor Reactance	5.902	5.902	(ohms)
Total Reactance	5.92	5.92	(ohms)
Total Resistance	10.061	10.061	(ohms)
Voltage at Motor	409.2	409.2	(Volts)
Voltage Ratio	0.89	0.89	

Other MIDAS technical capabilities include:

- Voltage drop analysis using ComED or voltage divider methods
- AC motor torque analysis using ComED, Limitorque, or Rotork methods
- DC motor torque analysis and stroke time analysis using BWROG methodology
- EPRI butterfly torque methodology
- EPRI unwedging analysis for gate valves
- JOG Classification and CAI Rating using JOG methodology
- Pressure Locking analysis using ComED methodology (WOG)

BWROG DC Methodology for BWROG-19

Print Exit

General Information | Valve Information | Detailed Results

Parameters

Valve Type: **GLOBE**

Load Profile Method: **Input Stem Thrust**

User Defined Stem Thrust:

Use FAC for position controlled strokes? Yes No

	CLOSE NON-SAFETY	OPEN SAFETY
Degraded Voltage at Motor (VDC)	120.8	120.8
Instantaneous Actuator Torque (ft-lbs)	175.5	175.5
FAC: Functional Actuator Capability (ft-lbs)	0	0
Predicted Stroke Time (sec)	24.17	24.17

Calculation Feedback

FAC not calculated for Load Profile Method=Input Stem Thrust
 FAC not calculated for Load Profile Method=Input Stem Thrust
 Maximum D-P (close) = 0
 Maximum D-P (open) = 0
 DC Valve Pressure at Full Open (close) = 0
 DC Valve Pressure at Full Open (open) = 0
 System Flow Rate = 0
 DC Fluid Density (lbs/ft³) = 0
 DC Length of Upstream Piping, diameters = 0
 DC Additional Stroke Time (close) = 0

JOG PV Methodology for MO-2-12-015

Print Exit

JOG Class: **D** | CAI Rating: **1** | Valve Family: **1** | Schedule: **Outage** | Risk: **H** | Interval: **2.0** (years) | Max Interval: **4** (years) | Margin: **6%**

Current PVI: **2.0** | Calculated PVI: **4**

Safety Function: **CLOSE** | Close Control: **TORQUE**

Parameter	CLOSE SAFETY VF	OPEN NON-SAFETY VF	Reference
Valve Factor (Design Input)	0.70	0.70	56
Valve Factor (Effective)	0.57	0.57	56
Valve Factor based on COF Threshold	0.75	0.56	
Valve Factor Effective + Allowance	0.74	0.53	
Valve Factor Capability	0.715	0	
COF based on Effective Valve Factor	0.53	0.71	
COF based on Effective Valve Factor + Allowance	0.55	0.73	
COF based on Valve Factor Capability	0.57	0	

Implementation / Evaluation Details: **37.4**

EPRI Butterfly Methodology for EPRI-BF-03

Print Exit

General Information | DP Information | Detailed Results

Valve | System | Coefficients

Parameter	Value	Reference
Valve Disc Configuration	Symmetric	N/A
Valve Disc Shaft Location	Centered	N/A
Valve Disc Aspect Ratio (thick/dia)	0.220	N/A
Valve Nominal Diameter (in)	30.000	N/A
Valve Stem Orientation	HORIZONTAL	N/A
Valve Stem Diameter (in)	3.480	N/A
Packing Torque (CLOSE) (ft-lbs)	350.0	N/A
Packing Torque (OPEN) (ft-lbs)	350.0	N/A

	@VALVE	@ACTUATOR
Total Unseating Torque	2061.8	114.54
Total Seating Torque	2061.8	114.54
Total Dynamic Opening Torque	144	8
Total Dynamic Closing Torque	2116.6	117.59
Required Opening Torque	2061.8	114.54
Required Closing Torque	2116.6	117.59

Calculation Feedback

Kv_min Calculated using BF Valve Flow Coefficient (Full Open)
 BF Double Offset Dimension (in) = 0
 BF Pressure Dependent Seal TQ Coef = 0

MOV Design & Test Database Software

Pre-Test Setup for MO-2-12-015 WO# C0222222

Close Control Scheme: TORQUE Safety Function: CLOSE

Setup Setup (cont'd) As-Found As-Left Previous Test

Reason For Diagnostic Test: GL96-05 PVT

Recommended Diagnostic Test System: Quiklook

Test Criteria Selection Basis: Thrust & Torque

Recommended Device to Acquire Thrust: QSS

Recommended Device to Acquire Torque: QSS

Running Load Criteria Selection Basis: Thrust Torque Handwheel

Packing Adjustment Method (select one): N/A Wrench Tight Maximum Packing Gland Torque and Expected Running Load Range

Maximum Allowable Running Current: 28.00

Maximum CLOSE Stroke Time: 32 seconds

Maximum OPEN Stroke Time: 31 seconds

Maximum Handwheel Run Torque: 66.00 ft-lbs

Rich Enos 1/13/11 16:06:15

NOT APPROVED 1/13/11 16:06:15

Exit Cancel

Trending for MO-3-23-014 WO# OLD 97 Test

Parameter	Previous Test Data		Interval	Current Test Data		PM	
	AF Test Data	AL Test Data		%Change	AF Test Data		AL Test Data
Work Order Number	OLD 92 Test		*	OLD 97 Test		*	
Test Type	N/A		*	Thrust & Torque		*	
Test Date	8/17/92		*	4/17/97		*	
Test Number	92aqrnj	92aqrnp	*	970trxe	970tryr0	*	
Close TSS	1.5	1.5	*	1.5	1.5	*	
C14	Thrust (lb)	12883	37424	-10	33700	37378	10.9
	Torque (ft-lb)	32	88	2403.4	2203	2187	-0.7
	Current (amps)	30.04	30.53	-16	25.64	24.18	-5.7
	Power (KW)	2.64	2.81	75.1	4.92	4.16	-15.4
C16	Power Factor	0.75	0.51	78.4	0.91	0.79	-13.2
	Thrust (lb)	16010	39978	*	39803	44599	*
09	Torque (ft-lb)	38	93	*	2558	2598	*
	Thrust (lb)	12883	37424	-47.6	19613	18142	-7.5
C14	Torque (ft-lb)	32	88	-92	7	10	42.9
	Current (amps)	30.04	30.53	*	13.43	8.55	*
	Power (KW)	2.64	2.81	*	1.65	2.12	*
Power Factor	0.75	0.51	*	0.8	0.04	*	

Current Test Data --> OLD 97 Test N/A Complete 4/17/97 ...

Previous Test Data --> (Highlight Row to Select)

Work Order	Schedule	Status	Test Date	Test of Record
C0195426	N/A	Complete	9/16/01	YES
C0180487	N/A	Legacy	3/21/98	...
OLD 97 Test	N/A	Complete	4/17/97	...
OLD 92 Test	N/A	Legacy	8/17/92	...
Review V&V	2005	Pre-Test	12/3/91	...

Rich Enos 1/5/07 13:03

TELEDYNE 1/5/07 13:19

Exit Cancel

MIDASTEST is the primary MOV maintenance tool for a utility. It provides:

- MOV diagnostic test preparation
- Powerful export to Excel reporting tool
- Diagnostic test and PM data review

- Comparison of as-found to as-left performance
- MOV data analysis and trending
- Direct import of as-found and as-left test data and results

Data Review for MO-3-12-068 WO# R0546205

Parameter	Marker	Thrust	Torque	Disp	Current	Power	PF
Torque Switch Trip	C14	18501	166.0	0.000	2.80	0.00	0.00
CLOSE Maximum	C16	21556	189.0	0.000			
Disk Pullout	09	0	0.0	0.000	0.00	0.00	0.00
CLOSE Run	ARO	2272	29.0	0.000	2.80	0.00	0.00
OPEN Run	ARO	2180	28.0	0.000	2.90	0.00	0.00
CLOSE InRush	C1				18.80	0.00	0.00
OPEN InRush	O1				17.10	0.00	0.00
Flow Cutoff (DP)	C10	0	0.0	0.000	0.00	0.00	0.00
Hard Seat	C11	0	0.0	0.000	0.00	0.00	0.00

Direction

Direction	C to C (Time)	CDO (Time)	TS Bypass (Time)	MSTT (Time)
CLOSE	19914	0.014	0.000	0.000
OPEN	19563	0.000	0.000	0.000

TELEDYNE 12/21/06 11:19:53

NOT APPROVED 12/21/06 11:19:53

OK Cancel

Import Test Data from 98D0dtkp

Parameter	Name	Marker	Time	Thrust votes fo	Torque cart cap	Spring Pack worm dis	DC Current raw moto	Power	Power Factor
Motor Start (C)	c0	c0	22.963	2147	2.4	0.001	0.81		
Peak Inrush (C)	c1	c1	22.906	2001	0.0	0.001	31.62		
Thread Transition Star	c3a	c3a	23.431	1127	19.3	0.002	2.56		
Zero Transition (C)	c3	c3	23.433	1127	21.7	0.002	2.56		
Thread Transition End	c3b	c3b	23.434	1127	130.3	0.002	2.56		
Close Bypass (C)	c7	N/A	*	*	*	*	*		
Flow Cutoff (C)	c10	N/A	*	*	*	*	*		
CST (C)	c14	c14	39.810	31025	3200.4	0.099	15.02		
Motor Stop (C)	c15	c15	39.865	33878	2417.5	0.118	1.10		
Max Sealing Current	c15	c15	39.865	33878	2417.5	0.118	1.10		
Max Thrust	c16	c16	39.909	34957	2449.9	0.122	0.86		
Max Torque	c16	c16	39.909	34957	2449.9	0.122	0.86		
Max Displacement	c16	c16	39.909	34957	2449.9	0.122	0.86		
Motor Start (O)	o0	o0	2.870	33027	2439.2	0.124	0.81		
Peak Inrush (O)	o1	o1	2.895	32387	2439.2	0.124	30.40		
Thread Transition Star	o4a	o4a	2.540	2439	2.4	0.001	2.01		
Zero Transition (O)	o4	o4	3.540	2439	2.4	0.001	2.81		
Thread Transition End	o4b	o4b	3.554	2439	7.3	0.001	2.81		
Unseating (O)	o8	o8	4.091	8995	53.1	0.001	3.79		
Open Bypass (O)	o12	N/A	*	*	*	*	*		
Open Light (O)	o16	o16	19.545	2505	12.0	0.001	2.56		
Motor Stop (O)	o17	o17	19.592	2585	16.9	0.001	0.86		
Average (C)	c4-c5	*	*	400	75.2	0.002	2.83		
Average (O)	o13-o14	*	*	2872	20.1	0.001	2.84		

Import Import Mechanical Properties Import Limits Import Power

Cancel



508-748-0103
www.valvetest.com

For more information, please visit our website or email
sales_testservices@teledyne.com