

PRESSURE LOCKING EVALUATION FOR REQUIRED PULLOUT FORCE (for Double Disc Split Wedge)

= INPUTS

MOV 1-FCV-63-25Valve type = DD Split WedgeARK No. 8801BVALVE DWG 93-12859

EPRI NP-6516 Calc Meth

VALVE DESIGN DATA $u =$ 0.4theta (A) = 0 dega = 1.8438 inchesro = 0.625 inchesb = 0.625 inchesv = 0.3(D) Mean Seat Dia $(D1+E1)/2 =$ 3.6875 in

(d) Stem Dia =

1.625 in(S2) Valve Seat Area $((D)^2 \cdot \pi / 4 =$ 10.68 (in)²(Vf) $\mu / (\cos A + \mu \sin A) =$ 0.4000(St3) Stem Area $((d)^2 \cdot \pi / 4 =$ 2.07 (in)²

(PI) Packing Load (Calculated) =

1625 lbs

(PI) Packing Load (Actual, average) =

0 lbs

EPRI MOV PPP INTERNAL DESIGN INFO. Ref. _____

D1 E1 M1

4.5 2.875 1.25a = $((D1 + E1) / 2) / 2 =$ 1.84375b = $M1 / 2 =$ 0.625 = rov = Poisson's Ratio = 0.3 $u =$ seating surfaces friction coef
based on Calc method. & EPRI resultstheta = 1/2 total valve
disk angleValve Seat Area Based on:
D1, E1PRESSURE and TEMPERATURE DATA

(Pb) Pbon =

2735 psi

(Pu) P up =

2600 psi

(Pd) P down =

0 psi

DP =

2600 psidPRESSURE INDUCED, PRESSURE LOCKING THRUST REQUIREMENT:

$$\text{THRUST} = [\{ (Pb - Pu) + (Pb - Pd) \} \cdot \{ S2 \} \cdot \{ Vf \}] - \{ (St3) \cdot (Pb) \} + PI] + \text{UNWEDGING}$$

WHERE: Pb = Pressure in valve Bonnet
Pu = Pressure upstream of Valve
Pd = Pressure downstream of Valve

UNWEDGING = 0 lbs

S2 = Valve Seat Area
Vf = Valve Friction Factor
St3 = Stem Area
PI = Packing load (maximum value)

THRUST = 8213 lbsPRESSURE INDUCED, P L - MAXIMUM BONNET PRESSURE @ ACT/VALVE LIMITING CAP

$$\text{PRESSURE} = \{ A/VLIMTH + (S2 \cdot Vf \cdot (Pu + Pd)) - PI \} / \{ (2 \cdot S2 \cdot Vf) - St3 \}$$

PRESSURE = 3879 psi

Rev

Prepared: R. J. [Signature]Checked: [Signature]

9608130248 960806
PDR AD0CK 05000327
P PDR

PRESSURE LOCKING REQUIREMENT =

8213 lbs

ACTUATOR OR VALVE CAPABILITY EVALUATION

CALCULATION:

1-FCV-63-25

Actuator Model

SMB-0

Motor Start Torque (MT)

15 flbs

Overall Gear Ratio (OGR)

87.2

Pullout Efficiency (PE)

40 %

Application Factor (AF)

0.9 or 1.0

1

Valve Factor (VF)

1.0 or (VF/460)**2

0.6100

359.3VAC

Stem Factor (SF)

0.0187

Max Temperature (Temp)

215 F

Loss Percentage (elevated temp)

21.4 %

Note 1

Torque Loss Factor = $1 - \text{Loss\%} \cdot (\text{Temp} - 104) / (356 - 77)$

0.9149

Actuator Torque Capability = $(\text{MT} \cdot \text{OGR} \cdot \text{PE} \cdot \text{AF} \cdot \text{TLF} \cdot \text{VF})$

291.98 flbs

SF =

Actuator Thrust Capability = Torque/Stem Factor

15614 lbs

0.0187

Actuator Thrust /Torque Rating

33600 lbs

500.00 flbs

Valve Weak Link Thrust/Torque Rating

49870 lbs

SF =

932.57 flbs

0.0187

Seismic Thrust/Torque Rating

33600 lbs

SF =

628.32 flbs

0.0187

Note 1: Reference: Limitorque Technical Update 93-03

RESULTS:

PRESSURE LOCKING REQUIREMENT =

8213 lbs

ACTUATOR / VALVE LIMITING CAPABILITY =

15614 lbs

1 CUT = MOTOR CAP

COMMENTS:

Rev.

Prepared:

Checked: