



**cicda**  
COMBUSTIÓN INDUSTRIAL Y CONTROL S.A. DE C.V.

# LAR Training

Series 8000 Pneumatic Safety Shut Off Valves

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May, 18 2015

**Honeywell**

  
**MAXON**  
A Honeywell Company

# Series 8000 Pneumatic Valve

- ▶ Unique vertical space saving design
  - Maintenance free gas and fluid seal that eliminates packing around the stem
  - Quick exhaust and powerful spring closure in less than 1 second
- ▶ Large top mounted open/shut indicator for highly visible valve open/close status
  - Valve is easily rotated in 90° increments to fit specific mounting requirements
- ▶ Valve is field replaceable without breaking wet pipe
- ▶ Offered in a wide range of sizes and materials
  - 3/4" – 8" sizes with a range of mounting flanges
  - Cast iron, carbon steel, low temperature carbon steel, stainless steel
  - Trim options for clean and corrosive gas, oxygen, and liquids



# Series 8000 Pneumatic SSOV

## ► The Maxon Series 8000 Pneumatic Safety Shut-off Valve

- Combines an integral solenoid in a unique, space-saving design featuring a maintenance-free gas and fluid seal
- Eliminates packing adjustments around the stem, reduces maintenance, and minimizes drag on opening and closing.
- The Series 8000 SSOV well suited for use in the most demanding industrial heat, general process control, and oil and gas installations.

## ► Application Flexibility

- Available in a wide range of sizes from  $\frac{3}{4}$ " to 8"
- Different materials of construction including cast iron, carbon steel, low temperature carbon steel and stainless steel body assemblies
- Internal trim options to accommodate general purpose gases, corrosive gases, oxygen, and liquids such as oil.



# Valve Status Indicator

- ▶ Highly visible indication valve position indicator
- ▶ Valve position color contrast is easily visible and distinguishable to the user
- ▶ New visual indicator provides color contrast to identify valve position and flow
  - Red – indicates no flow, or valve closed position; Green – indicates flow, or valve open position
  - Red – indicates flow, or valve open position; Green – indicates no flow, or valve closed position
  - Black – indicates no flow, or valve closed position; Yellow – indicates flow, or valve open position
- ▶ Varying color schemes offer flexibility to meet needs in all production areas



# Temperature Range

- ▶ High temperature - Fire Safe Rated Series 8000 is validated to API-6FA (6A/6D) or to API 607, both standards are based on BS6755
  - The test involves exposing the valve to flame temperatures of 760°- 980°C
  - API-6FA and 607 both require burn period of 30 minutes, which is among the most stringent of the various tests performed

API 607 is “Fire Safe for Soft-Seated Quarter Turn Valves”  
API-6FA is designated “Specification for Fire Test for Valves”



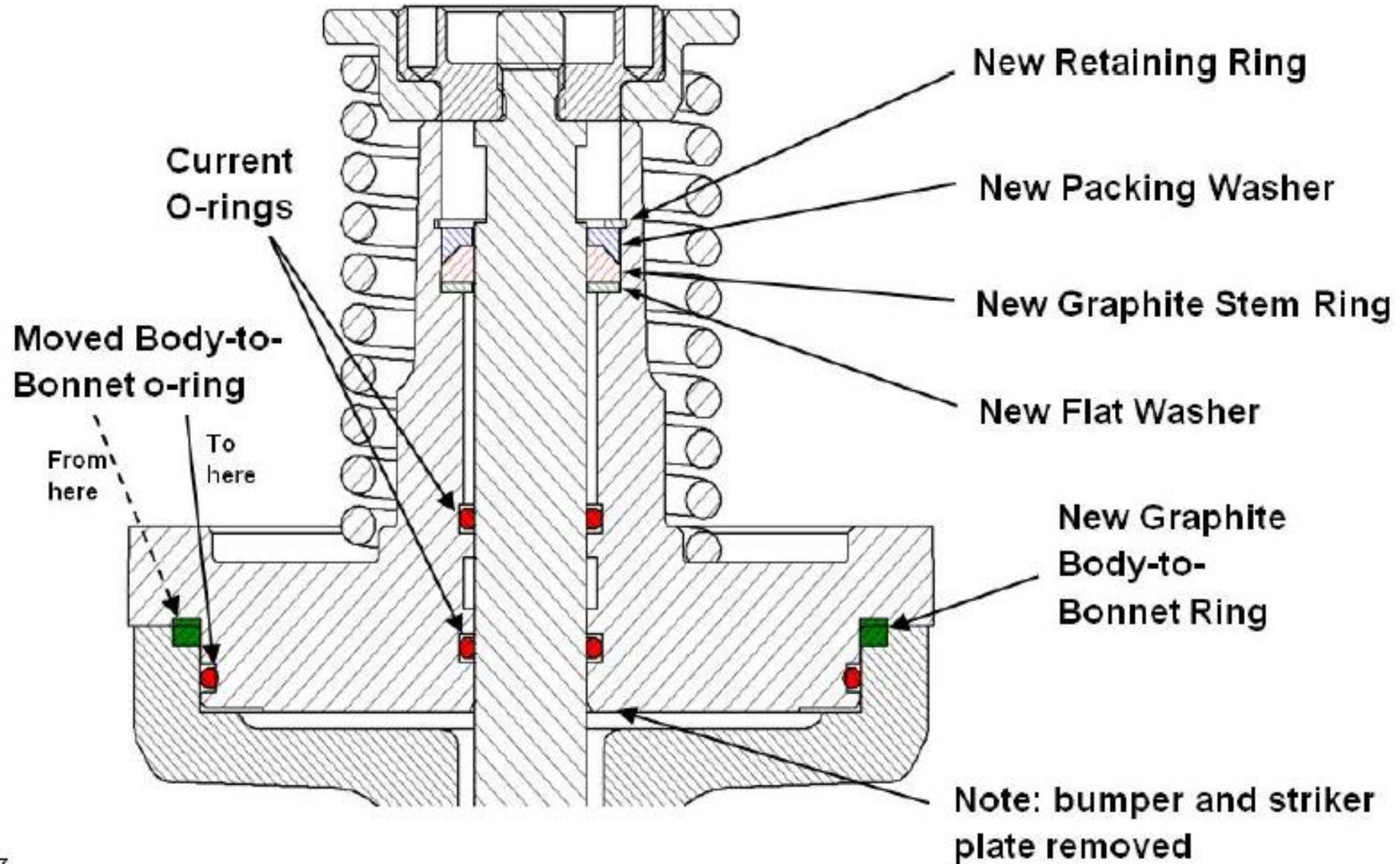


# Temperature Range

- **Low Temperature Option to -50°C**
  - **Solenoid valves and cylinders modified to include low temperature seals**
    - ◆ Low temp solenoids available in all currently available voltages (24VDC, 24VDC IS, 120VAC 50/60 Hz, 240VAC 50/60 Hz)
    - ◆ Low temp cylinders available in NEMA 4 or NEMA 4X type actuators
  - **Utilize Omniflex o-rings in Maxon valve body assembly**
    - ◆ Supplying the highest quality seals available for aggressive fuels
    - ◆ Rated for low temperature service to -56°C (-70°F)
  - **CSA, FM, AGA, and European approvals maintained**
    - ◆ Closing time within requirements of all standards (<1 second)
    - ◆ Seat and external leakage within allowable limits
    - ◆ Low temperature valves also meet FCI 70-2 Class VI seat leakage requirements



# 8000 Valve Performance



# Allowable Leakage

- Agencies subject valves to rigorous test addressing construction, mechanical and electrical performance.

Cycling and leakage requirements for a typical 3-inch gas valve from various agencies.

Shut-Off Valve Standard	No. of Cycles at Rated Pressure			Allowable Leakage (ccm)
	Maximum Published Temp	Minimum Published Temp	Ambient Temp	
FM 7400	0	0	20,000	6.67
CSA 6.5 C/I	90,000	10,000	0	10.81
EN 161	25,000	25,000	50,000	1.00





# Metal on Metal Seating

► What does this really mean?

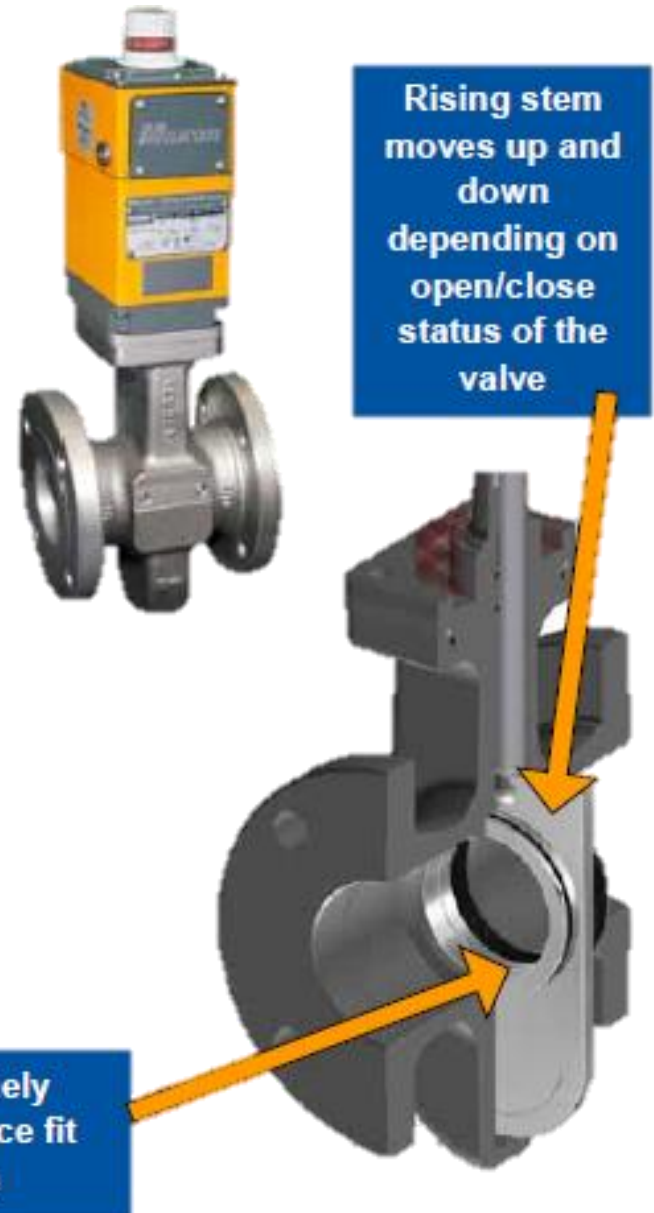
**“Wear in, not out”**

- **Proper trim selection** for the application will allow 10+ years of operation
- **Precision ground and polished** – combination of surface finish, hardness, material selection
- **Increased cycle rate ( partial or full)** will improve seating surface; i.e. **“wear in”** function
- **Self-cleaning** the seating surfaces of the disc and seat remain in contact throughout valve stroke
- **Self-correction** cycle the valve to tighten seat leakage.



# Shut-off Sealing Mechanism

- ▶ Unique metal-to-metal shut off valve mechanism
  - Meets FCI 70-2 control valve standard for Class VI seat leakage
  - Uses a matched set of finely ground shut-off rings mated with a rising stem.
  - Provides a complete, tight seal that does not rely on soft seals (that tends to wear out with repeated movement)
- ▶ Cycling the valve provides a self-cleaning, corrective action
  - Keeps the valve's performance consistent over longer periods of time
  - Actually improves seal with repeated use
  - Valve's performance is fully enhanced by using Partial Stroke technology
  - Valve wears in, not out!



# Seat Leakage Compliance

Seat leakage: Installation codes such as NFPA, 85, 86 and 87 calls for listed valves.

Maxon  
Specific  
Sizes

**Maxon 8000 valves meet FCI 70-2 for Class VI seat leakage**  
(comparatively most stringent)



Nominal Size	Bore	FCI 70-2 (Class VI)		ANSI Z21.21/CSA 6.5, & CGA 3.9			FM7400			EN 161		
		ml/min cc/min	Bubbles/ Minute	cc/Hr	ml/min cc/min	Bubbles/ Minute	cc/hr	ml/min cc/min	Bubbles/ Minute	ml/Hr cc/Hr	ml/min cc/min	Bubbles/ Minute
0.75	0.69	0.15	1	235.00	3.92	26	400	6.67	44	40	0.667	4
1	0.69	0.15	1	235.00	3.92	26	400	6.67	44	40	0.667	4
1.25	0.971	0.15	1	235.00	3.92	26	400	6.67	44	60	1.000	7
1.5	1.127	0.19	2	264.85	4.41	29	400	6.67	44	60	1.000	7
2	1.443	0.3	2	339.11	5.65	38	400	6.67	44	60	1.000	7
2.5 Rec Port	2.216	0.52	4	520.76	8.68	58	400	6.67	44	60	1.000	7
3 Rec Port	3.103	0.9	6	729.21	12.15	81	400	6.67	44	60	1.000	7
2.5CP	2.26	0.525	4	531.10	8.85	59	400	6.67	44	60	1.000	7
3CP	2.76	0.75	5	648.60	10.81	72	400	6.67	44	60	1.000	7
4CP	2.76	0.75	5	648.60	10.81	72	400	6.67	44	100	1.667	11
6"	4.5	2.275	16	1057.50	17.63	118	400	6.67	44	100	1.667	11



# Series 8000 Feature Upgrades

**New features and enhancements** to improve compatibility in the general combustion and O&G markets



## ► 8" Size 8000 Safety Shut-off Valve

- 150# and 300# ANSI as well as DIN flanges in carbon steel, low temperature carbon steel and stainless steel body assemblies
- Offered with the same fluid and pressure specifications as the 6" version with internal trim options to handle general purpose or corrosive gases and oxygen compatibility
- The 8" valve is fully NACE compliant, and conforms to Fire Safe code API 6FA

## ► 3/4" Size 8000 Safety Shut-off Valve

- ANSI/ISO threaded, socket welded nipple, socket welded nipple, and socket welded nipple with #150 and 300# flange mountings
- Available in carbon steel, low temperature carbon steel, and stainless steel





# Series 8000 Feature Upgrades

## ► External Redundant Solenoids

- Dual shut-off solenoids provide additional SIL2 certification levels to offer a higher level of protection against potential solenoid failure.
- The redundant solenoid acts in series with the internal solenoid. If either solenoid trips, the valve will close/open (STO).

## ► External Redundant Solenoids with Manual Reset

- Combination of both external redundant solenoids with manual reset option.
- If either solenoid trips, the valve will close/open (STO) and must be reset manually at the site of the valve before operations can resume.



# Series 8000 Feature Upgrades

## ► Material Certifications

- Material certification paperwork for full compliance can now be ordered directly through the configurator.

## ► NDE (non-destructive engineering tests)

- Visual inspection (VI)
- Liquid Penetrate (PT)
- Positive Material Identifications (PMI)
- Magnetic Particle testing (MT)
  - Additional tests that are available with as specials
- wUltrasonic (UT), Radiography (RT)

## ► PED (pressure equipment directive)

- Certification for EMEA compliance (Mid 2015)



# Series 8000 Feature Upgrades

## ► Non-Destructive Engineering (NDE)

- Certified testing certificates are now available as a stock offering
- On bonnet and valve castings as well as valve weld
  - Each is priced per valve
  - For larger lot pricing, call for quote on
- Liquid Penetrate (PT), Positive Material Identifications (PMI), Magnetic Particle testing (MT)
- By special request - Ultrasonic (UT), Radiography (RT)



# SIL - Safety Integrity Level

Valves are part of a safety instrumented system/function

Can be arranged to meet SIL performance levels potentially as high as SIL-3

## ► SIL Approvals for Maxon Valves

- Third party reviews valve design, application details as well as quality systems, returns, production data, etc.
- FMEDA developed - Includes failure rate data and sample calculation on PFD (probability of failure on demand), calculates proof test intervals (i.e. maintenance Schedule)

*\*Available customers upon request*

- Certification to IEC 61508 – evaluates mechanical performance of valves – Reliability data can be used in assessments per IEC 61508 and 61511 for SIL verification.








*\*Available customers upon request*





# Agency Approvals

## ❖ Agency approvals and certifications

	General Purpose Valves R111, R121, R011, R021 Series		Non-Inductive/Non-Sparking Valves R112, R122, R012, R022 Series [3]		Intrinsically Safe Valves R113, R123, R013, R023 Series [4]	
	Standards	Markings	Standards	Markings	Standards	Markings
FM Approvals	FM 740D		FM 740D FM 3611 FM 360D FM 381D	Class I, Div 2, Groups ABCD, T4 Class II, Div 2, Groups FG, T4 Class III, Div 2, T4 	FM 740D FM 361D FM 360D FM 381D	Class I, Div 1, Groups ABCD, T5 Class II, Div 1, Groups EFG, T5 Class III, Div 1, T5 
CSA International	CSA 6.5		CSA 6.5 CSA 22.2 No. 213 CSA 22.2 101D.1 CSA E60079-0 CSA E60079-15	Class I, Div 2, Groups ABCD, T4 Class II, Div 2, Groups FG, T4 Class III, Div 2, T4 Ex. nA IIC T4 Ta - 60C (per standard calculation) (Zone 2 approval) Ex. nA IIC T5 Ta - 50C (per standard calculation) (Zone 2 approval)  C/I UL 143, 3037	CSA 6.5 CSA 22.2 No. 157 CSA 22.2 101D.1 CSA E60079-0 CSA E60079-15	Class I, Div 1, Groups ABCD, T5 Class II, Div 1, Groups EFG, T5 Class III, Div 1, T5 Ex. nA IIC T5 Ta - 60C (Zone D Approval)  C/I UL 143, 3037 UL 143
European Approvals [1]	EN 161 EN 13774	CLASS: A, BR 2 EC PN: C08C045	EN 161 EN 13774	CLASS: A, BR 2 EC PN: C08C045	EN 161 EN 13774	CLASS: A, BR 2 EC PN: C08C045
European Approvals [2] (Hazardous Locations)	Not Applicable		Not Applicable		EN 60079-0: 2006 EN 60079-1: 2007 EN 60528: 1999 EN 61241-1: 2006 EN 13463-1: 2004 EN 13463-5: 2003	 II 2 G c Ex. nA IIC T5 Ta - 50C to +50C IP65 II 2 D c Ex. nA IIC T5 Ta - 50C to +50C FM 3611, 360D and 381D standards
IEC Approvals	IEC 61010-1 IEC 61508		IEC 61010-1 IEC 61508		IEC 61010-1 IEC 61508	

[1] Product certified to meet the following: Gas Appliance Directive (2009/24/EC); Low Voltage Directive (2006/95/EC); EMC Directive (2004/108/EC)

[2] Product certified to meet the following: ATEX Directive (2002/95/EC)

[3] Valves used with a customer-supplied, externally mounted solenoid, MAGNUM R112, R122, R012, R022 valves will only carry FM Approval to FM 3611, 360D and 381D standards.

[4] Valves used with a customer-supplied, externally mounted solenoid, MAGNUM R113, R123, R013, R023 valves will only carry FM Approval to FM 3611, 360D and 381D standards.



# Assembly Number Pages

To determine the configured item number:

Select one choice from each of the following five categories

Configured Item Number				
Valve Size	Flow Capacity	Pressure Rating	Normal Position	Area Classification

Valve Size

075 - 3/4" (DN 20)  
100 - 1" (DN 25)  
125 - 1-1/4" (DN 32)  
150 - 1-1/2" (DN 40)  
200 - 2" (DN 50)  
250 - 2-1/2" (DN 65)  
300 - 3" (DN 80)  
400 - 4" (DN 100)  
600 - 6" (DN 150)  
800 - 8" (DN 200)

Flow Capacity

S - Standard  
C - CP Body Construction

Pressure Rating

80 - Pneumatic Standard Pressure  
81 - Pneumatic High Pressure

Normal Position

1 - Normally-Closed Shut Off Valve  
2 - Normally-Open Vent Valve

Area Classification

1 - General Purpose  
2 - Non-incendive, Class I, II and III Division 2  
3 - Intrinsically Safe, Class I, II and III Division 1  
(and ATEX Zone 1/21 when ordered with the ATEX  
IS solenoid) [1]  
4 - Valve body only

[1]122°F maximum ambient temperature limit

*Example:*

To order a 3" CP body, high pressure rating, normally-closed shut-off valve for general purpose use, make the following selections:

Valve Size.....300  
Flow Capacity..... C  
Pressure Rating.....81  
Normal Position .....1  
Area Classification.....1

The configured item number for this valve is: **300 C 8111**

Segment choices for Series 8000 Pneumatic Gas Valves are shown on the following pages.



# What Keeps You Awake at Night?



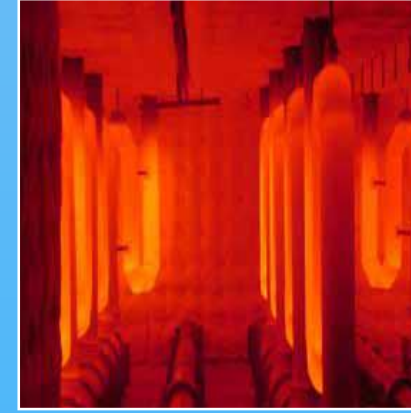
## Safety

- Protect people, assets, and process
- Billions lost per year in Industry



## Reliability

- Improve Availability  
Reduce Downtime
- Revenue lost each year due to unplanned production losses



## Environmental

- Improve Emissions and Compliance
- Automate and control more efficient thermal processes & emissions



# Maximize Safety and Reliability

- ▶ Safety is the number one concern
- ▶ There are Prescriptive and Directive Standards to Consider like NFPA86 and IEC61508/11
- ▶ Code compliance is complicated, complex and ever-changing
- ▶ Are the existing standards sufficient?

**DON'T OPERATE  
UNAWA!RE**





## FUNCTIONAL SAFETY LIFE CYCLE

Management of  
Change

**STEP 5**  
MAINTAIN & IMPROVE  
SAFETY SYSTEM



**STEP 1**  
RISK OR HAZARD  
ASSESSMENT

LOPA/HAZOP



**Safety Life  
Cycle**

**STEP 2**  
SAFETY SYSTEM  
FUNCTIONAL  
REQUIREMENTS

Functional  
Requirements  
Specification



**STEP 3**  
SAFETY SYSTEM  
DESIGN & VERIFICATION

Detailed Design  
Debug FAT

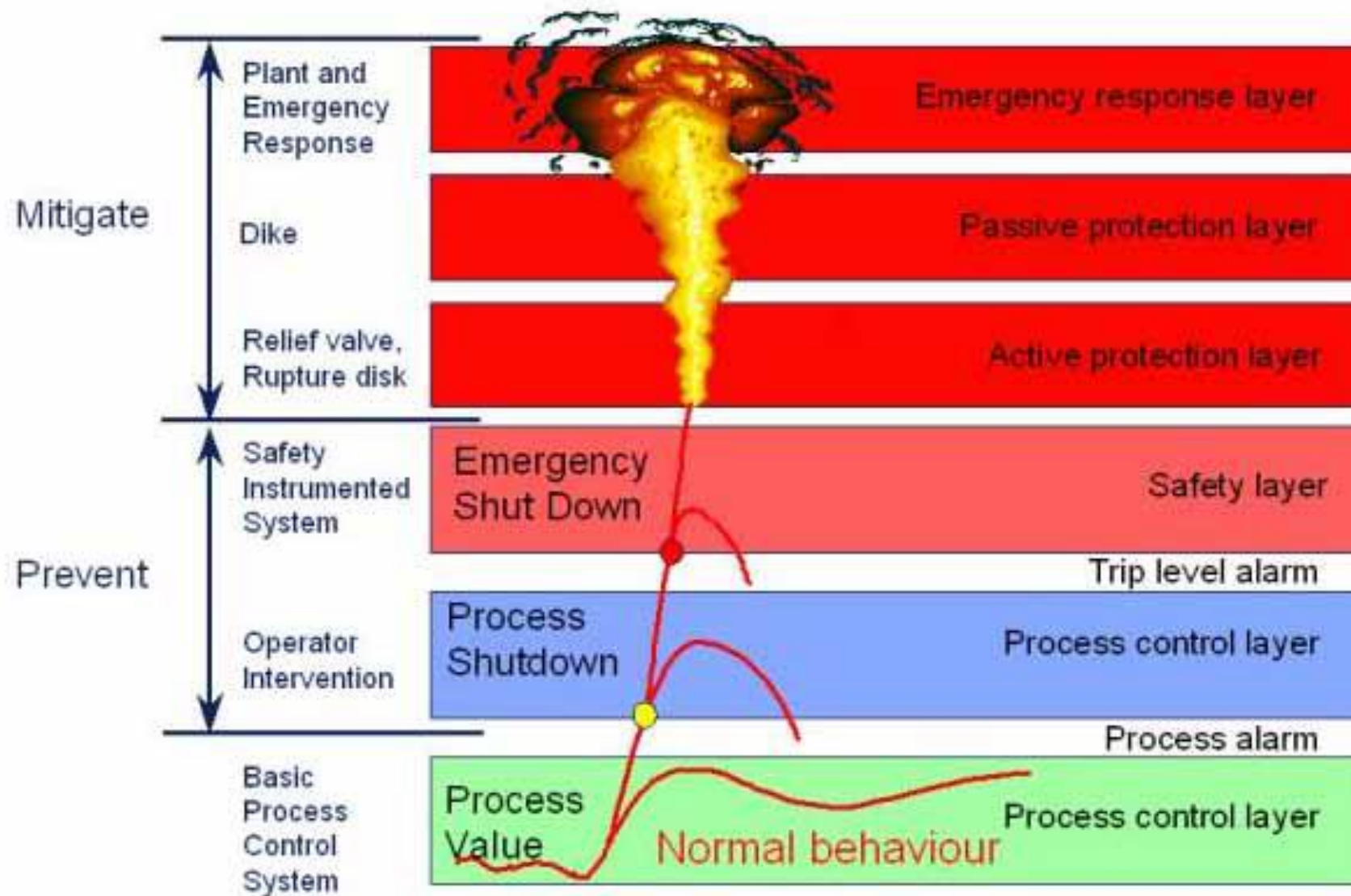


**STEP 4**  
SAFETY SYSTEM  
INSTALLATION &  
VALIDATION

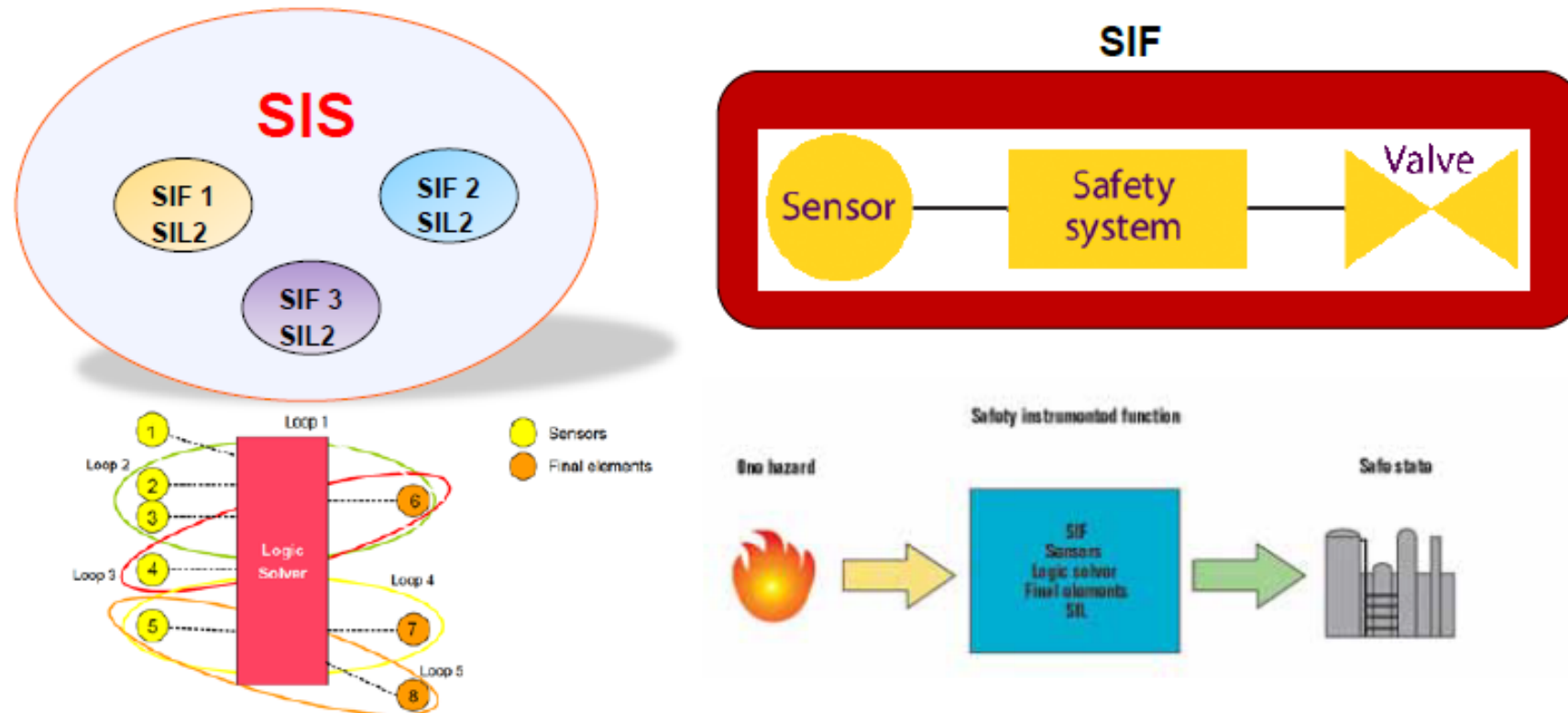
Installation  
Commissioning  
Start-Up



# Role of a SIS



# Relation Between SIS, SIF, SIL



SIF: A Safety Instrumented Function (SIF) is a safety function with a specified Safety Integrity Level (SIL) which is implemented by a SIS in order to achieve or maintain a safe state.

**A SIS CONTAINS MULTIPLE SIF'S**



# A BMS System

A Burner Management Systems comprises of Various Safety Instrumented Functions

## Fuel Train

- Pressure Relief Valve
- Shut- Off Valves



## Control Panel/PLC

- PLC
- High Temp Limit Control



## Sensors

- Flame Detector
- Pressure Switch





# Prescriptive Standards/Guidelines

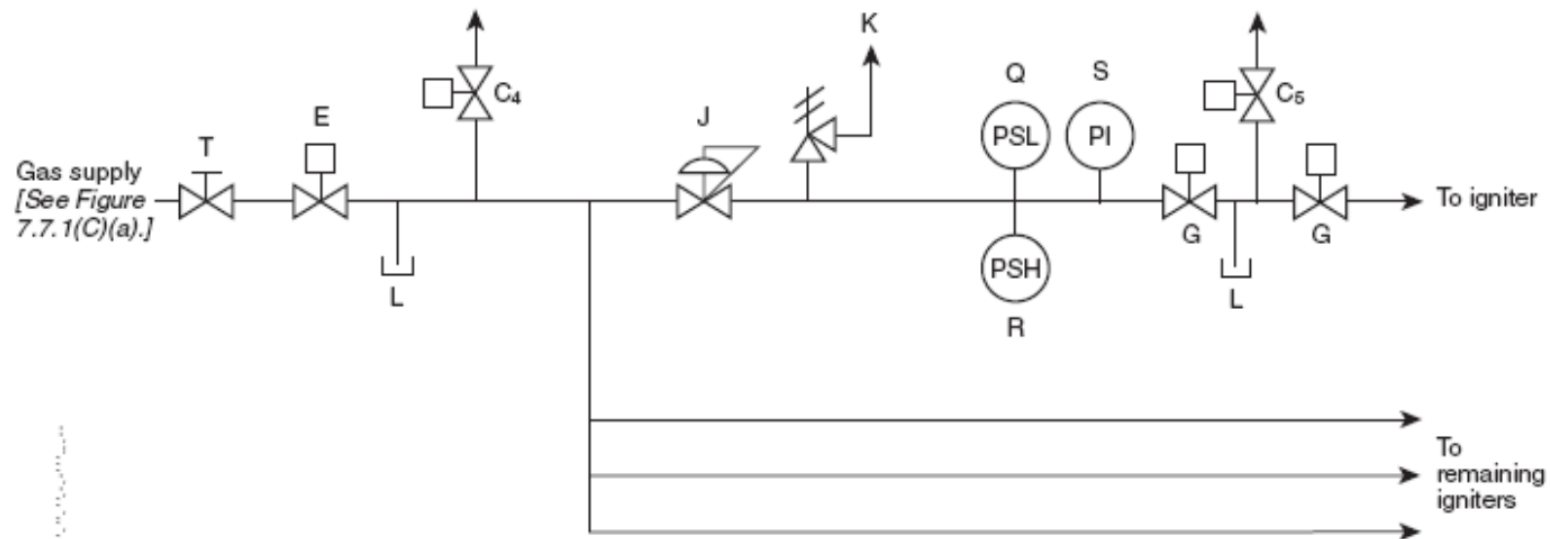
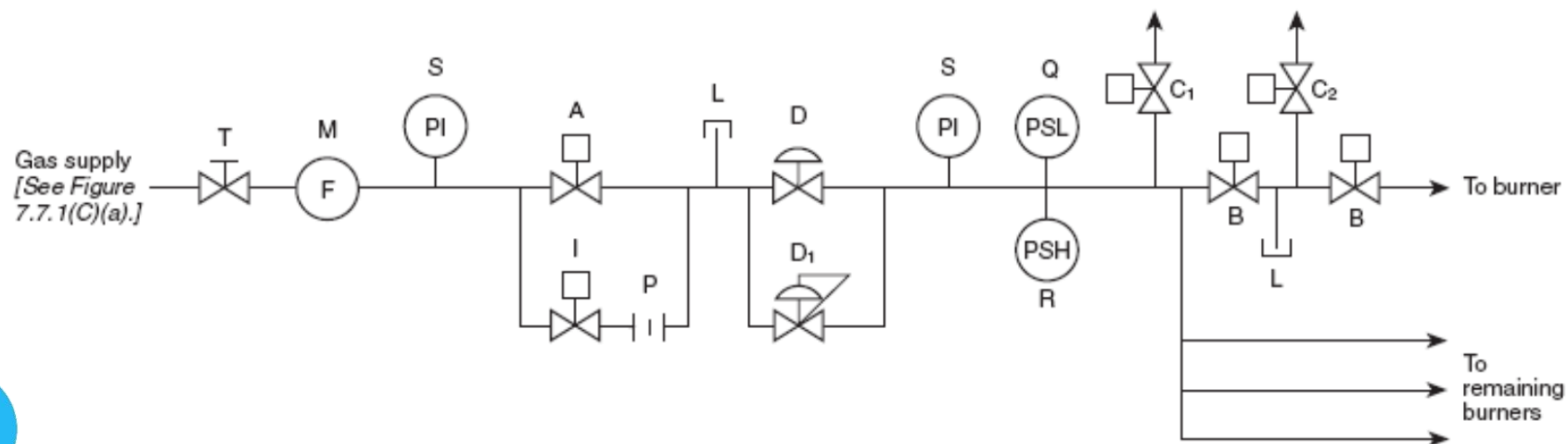


FIGURE 7.7.1(C)(c) Fuel Gas Ignition System — Individually Controlled Igniters (Automatic).







# Directive Standards (Performance Based)

IEC 61508


**SAFETY: FREEDOM FROM UNACCEPTABLE RISK**




Boiling Liquid Expanding Vapor Explosion (BLEVE)




Flash Fire



Jet Fire



Ball Fire




Fireball


## UNDERSTANDING SAFETY INTEGRITY LEVELS

IEC 61511

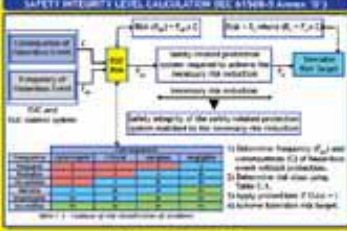
### TOLERABLE RISK AND ALARP (IEC 61508-3 Annex 10)



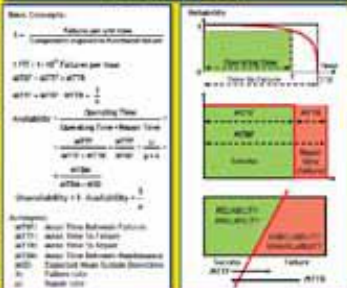
**RISK REDUCTION (IEC 61508-3 Annex 10)**



### SAFETY INTEGRITY LEVEL CALCULATION (IEC 61508-3 Annex 10.2)



### AVAILABILITY AND RELIABILITY




### SIL LEVELS ACCORDING (IEC 61508 / IEC 61511)

SIL	Failure rate per hour (λ)	Failure rate per hour (λ)	Failure rate per hour (λ)
SIL 4	< 10 <sup>-9</sup> and < 10 <sup>-7</sup>	< 10 <sup>-9</sup> and < 10 <sup>-7</sup>	< 10 <sup>-9</sup> and < 10 <sup>-7</sup>
SIL 3	< 10 <sup>-8</sup> and < 10 <sup>-6</sup>	< 10 <sup>-8</sup> and < 10 <sup>-6</sup>	< 10 <sup>-8</sup> and < 10 <sup>-6</sup>
SIL 2	< 10 <sup>-7</sup> and < 10 <sup>-5</sup>	< 10 <sup>-7</sup> and < 10 <sup>-5</sup>	< 10 <sup>-7</sup> and < 10 <sup>-5</sup>
SIL 1	< 10 <sup>-6</sup> and < 10 <sup>-4</sup>	< 10 <sup>-6</sup> and < 10 <sup>-4</sup>	< 10 <sup>-6</sup> and < 10 <sup>-4</sup>


### AVERAGE PROBABILITY OF FAILURE ON DEMAND

**PF Davg**




### SAFE FAILURE FRACTION (IEC 61508-3 Clause 7.4)

**SFF**




### MEAN TIME TO SPURIOUS FAILURE

**MTTFs**

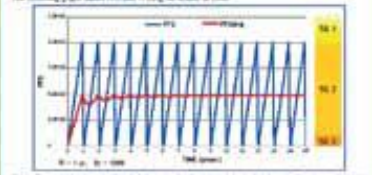


### SYSTEM ARCHITECTURES




### A PRACTICAL APPLICATION


Considerable effort is required to achieve the level of the following SIL, which involves a sequence of steps: a safety SIL, a SIL for the SIL, and a SIL for the SIL.



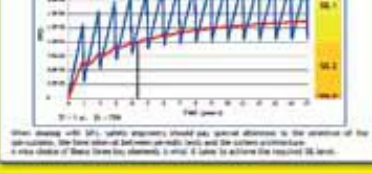
The following graph shows PF Davg vs Time (hours).



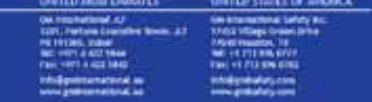
The following graph shows PF Davg vs Time (hours).



The following graph shows PF Davg vs Time (hours).



The following graph shows PF Davg vs Time (hours).



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**INTERNATIONAL TECHNOLOGY FOR SAFETY**

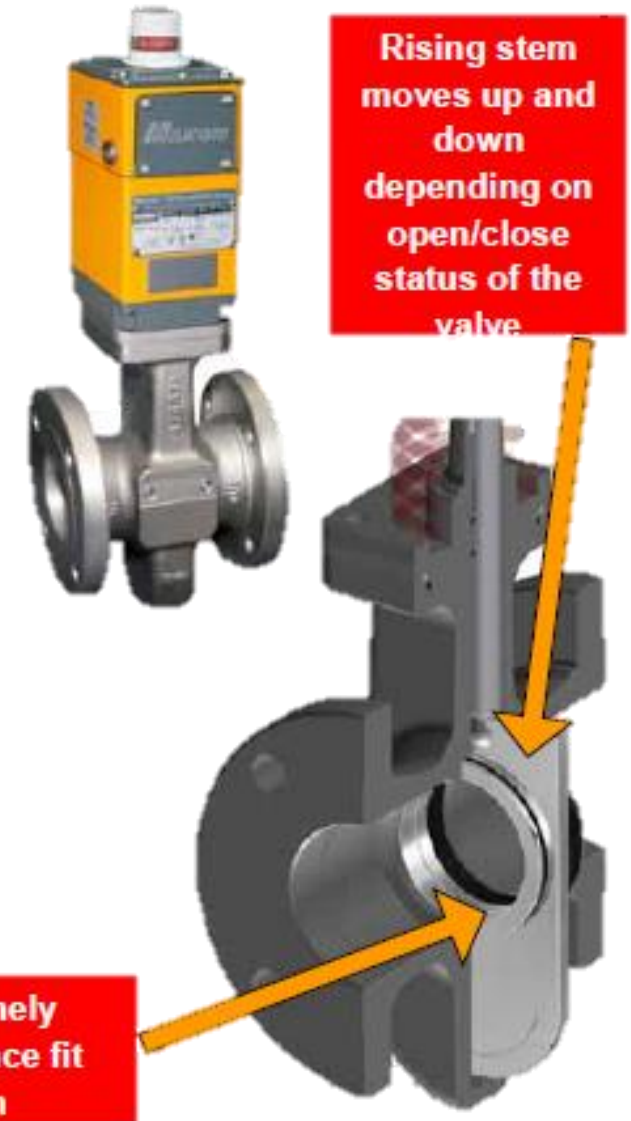
# Common Cause Failures

AVERAGE PROBABILITY OF FAILURE ON DEMAND		
PFDavg	$= \frac{\text{Tolerable accident frequency (F}_T\text{)}}{\text{Frequency of accidents without protection (F}_{NP}\text{)}} = \frac{1}{\text{RRF}}$	
	Simplified equations	
	Without common causes	With common causes (Beta factor)
1001	$\lambda_{DU} \times \frac{TI}{2}$	<i>not applicable</i>
1002 1002D	$\lambda_{DU_1} \times \lambda_{DU_2} \times \frac{TI^2}{3}$	$\frac{[(1-\beta) \times (\lambda_{DU} \times TI)]^2}{3} + \frac{(\beta \times \lambda_{DU} \times TI)}{2}$
1003	$\lambda_{DU_1} \times \lambda_{DU_2} \times \lambda_{DU_3} \times \frac{TI^3}{4}$	$\frac{[(1-\beta) \times (\lambda_{DU} \times TI)]^3}{4} + \frac{(\beta \times \lambda_{DU} \times TI)}{2}$
2002	$(\lambda_{DU_1} + \lambda_{DU_2}) \times \frac{TI}{2}$	$[(1-\beta) \times (\lambda_{DU} \times TI)] + \frac{(\beta \times \lambda_{DU} \times TI)}{2}$
2003	$\left[ (\lambda_{DU_1} \times \lambda_{DU_2}) + (\lambda_{DU_1} \times \lambda_{DU_3}) + (\lambda_{DU_2} \times \lambda_{DU_3}) \right] \times \frac{TI^2}{3}$	$[(1-\beta) \times (\lambda_{DU} \times TI)]^2 + \frac{(\beta \times \lambda_{DU} \times TI)}{2}$
1001 (Et < 100%)	$\lambda_{DU} \left[ \left( Et \times \frac{TI}{2} \right) + (1-Et) \frac{SL}{2} \right]$	TI: Proof Test Time Interval Et: Test Effectiveness λ <sub>DU</sub> : Dangerous Undetected Failures



# Shut-off Sealing Mechanism

- ▶ Unique metal to metal shut off valve mechanism
  - Meets FCI 70-2 control valve standard for Class VI seat leakage
  - Uses a matched set of finely ground shut-off rings mated with a rising stem.
  - Provides a complete, tight seal that does not rely on soft seals (that tends to wear out with repeated movement)
- ▶ Cycling the valve provides a self-cleaning, corrective action
  - Keeps the valve's performance consistent over longer periods of time
  - Actually improves seal with repeated use
  - Valve's performance is fully enhanced by using Partial Stroke technology
  - Valve wears in, not out!





# PST Assessment by Exida

Table 2 Failure Rates Series 8000 Valve

Failure category	Failure rate (FIT)			Failure rate w/PVST (FIT)		
	Close on Trip		FO-F/SR	Close on Trip		FO-F/SR
	FC-F/SR	FC-D/SR		FC-F/SR	FC-D/SR	
Fail Safe Detected	0	0	0	890	890	947
Fail Safe Undetected	890	890	947	0	0	0
Fail Dangerous Detected	0	0	0	422	422	422
Fail Dangerous Undetected	834	1389	777	412	967	355
No Effect	1366	811	1366	1366	811	1366

Table 3 Failure Rates Series 8000 Valve according to IEC 61508 ed2, 2010 (FIT).

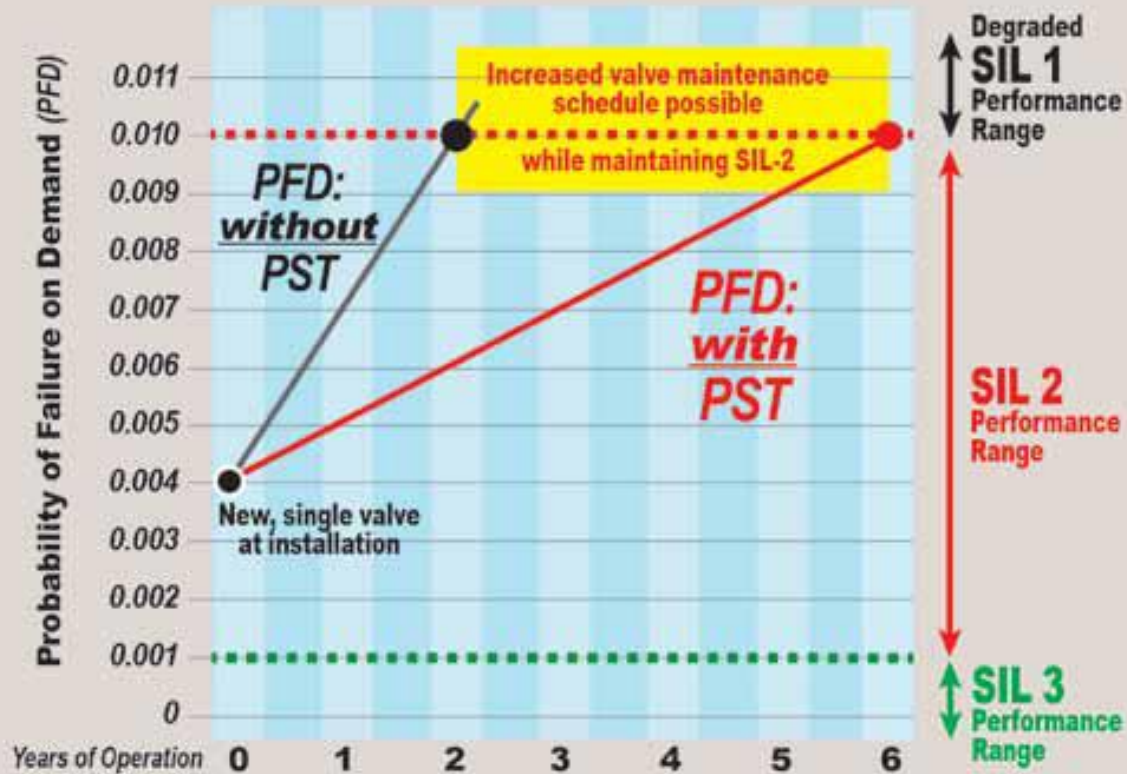
Application	$\lambda_{SD}$	$\lambda_{SU}^2$	$\lambda_{DD}$	$\lambda_{DU}$	SFF <sup>3</sup>
FC-F/SR	0	890	0	834	51.6%
FC-F/DS	0	890	0	1389	39.0%
FO-F/SR	0	947	0	777	55.0%
FC-F/SR with PVST	890	0	422	412	76.1%
FC-F/DS with PVST	890	0	422	967	57.6%
FO-F/SR with PVST	947	0	422	355	79.4%

PST Reduces the Dangerous Undetected Failure Rate by 50 %

# Max Uptime Effect

## Potential increased uptime with PSTrend

*This graph suggests that maintenance would be required within 2 years for an untested valve versus 6 years for one with monthly PST testing.*



A Certain SIL Level Must be Maintained between Maintenance Intervals





# Partial Stroke Test (PST)

A solution for a SIL3 compliant safety combustion system requires SIL2 PSCHECK



- ▶ The PSCHECK Technology with Partial Stroke Test is SIL2 compliant
- ▶ The Series 8000 pneumatic safety shut-off valve is SIL3 capable
- ▶ PSCHECK when combined with the 8000 valve is able to achieve a SIL3 rating for the complete system

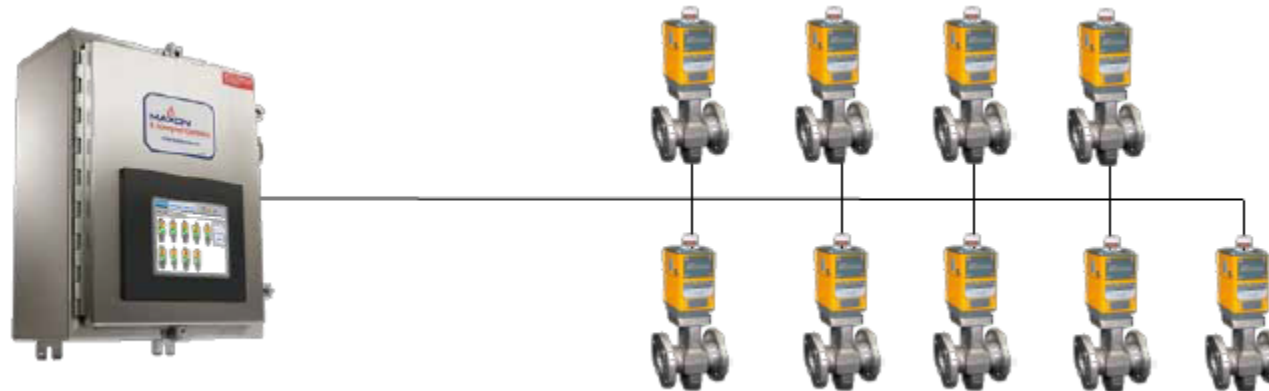


Will not interrupt any of the process flow nor will it impact the performance of the burner management system



# MAXON PSHECK Advantage

- ▶ Installation and maintenance on the PSCHECK System is substantially simplified
- ▶ Use of industry proven 8000 pneumatic safety shut off valves
  - Up to 9 valves per panel (panel sizes vary)
  - Can mix different valve sizes, MOC, trim options
- ▶ Wiring directly from a panel to the valve
- ▶ No additional hardware, software, or communication links required
- ▶ Lowers installation time, maintenance, total cost for system ownership



# MAXON PSHECK Features



- ▶ The valve is operating properly



- ▶ A customizable lower limit soft alarm
  - Will identify potential valve degradation and show health trending information over the life of the valve.
  - This alarm will prompt an alert that identifies a need for valve repair or replacement during future scheduled maintenance or process shut-downs.



- ▶ A factory set hard alarm limit to identify when the valve does not pass the partial stroke test
  - Prompts an alert that the valve failed the PST test and is not likely to close when needed.



# MAXON PSHECK Features

- ▶ Maxon's PST test will identify a potential degradation or a hard failure of the 8000 pneumatic valve
  - Uses patented Maxon technology
  - Checks the amount of time required for the valve to 'trip' signaling a capability to either open or close.
- ▶ See valve trending and history relative to soft and hard alarm settings
  - Three different settings to optimize the view
  - Change the vertical axis to better see the short and long-term trending
  - Trend data against initial valve health signature
- ▶ View test schedule
- ▶ Date of last PST test
- ▶ Launch a manual test



# MAXON PSCHECK Features

- ▶ Panels can be certified to
  - Class I - Div I (Z-purge)
  - Class I - Div 2
- ▶ Hazardous locations
- ▶ General purpose type 12X or 4X enclosure rating
- ▶ Additional features are available as special order:
  - Panel heating and cooling
  - Air line pressure tests
- ▶ Demo Units
  - Demo unit is fully functional single valve system showcasing the software capabilities
  - Limited quantity available for sales presentations

