


PROJECT :			DATE :	3/4/2011
PROJ. NO. :			BY :	SRM
CLIENT :			REV :	A
UNIT :			DOC NO.:	

**PRESSURE SAFETY VALVE CALCULATION SHEET (STEAM)**

General Data	
PSV Tag No.	RV-0301 A/B
P&ID No.	DWG-0400-FSO-068
Protected Equipment	V-319
Cause of Overpressure	B. D.

Steam Option

Saturated Steam

Superheated Steam

Operating Condition		
Maximum Operating Pressure	barg	70.00
Maximum Operating Temperature	°C	50.00
Max. Allowable Working Pressure	barg	80.00

Combination


Without Rupture Disk

With Rupture Disk

Relieving Condition		
Required Relieving Capacity	Kg/hr	3000.0
Set Pressure	barg	80.00
Allowable Overpressure	%	10.0
Superimposed Back Pressure (Constant)	barg	0.20
Superimposed Back Pressure (Variable)	bar	0.30
Built Up Back Pressure	bar	0.00
Relieving Temperature	°C	600.0

Calculation Results		
Flow Regime	<b>CRITICAL</b>	
Recommended Type (Conv./Bellows/Pilot)	<b>PILOT OPERATED</b>	
Total Back Pressure	barg	<b>0.50</b>
Relieving Pressure	bara	<b>89.00</b>
Combination Correction Factor ( $K_c$ )	----	<b>1.000</b>
Capacity Correction Factor ( $K_b$ )	----	<b>1.000</b>
Napier Equation Correction Factor ( $K_N$ )	----	<b>1.000</b>
Superheat Steam Correction Factor ( $K_{SH}$ )	----	<b>1.000</b>
Minimum Required Discharge Area	mm <sup>2</sup>	<b>64.83</b>
Selected Discharge Area	mm <sup>2</sup>	<b>70.97</b>
Orifice Designation	----	<b>D</b>
Inlet Size	in	<b>1.0</b>
Outlet Size	in	<b>2.0</b>
Actual Relieving Capacity	kg/hr	<b>3283.8</b>
No. of PSVs Required	----	<b>1</b>

General Notes

PROJECT :	0		DATE :	40606
PROJ. NO. :	0		BY :	SRM
CLIENT :	0		REV :	A
UNIT :	0		DOC NO.:	

**PSV SUCTION LINE SIZING CALCULATION FORM**

<b>PSV Tag No. :</b>	RV-0301 A/B	
<b>P&amp;ID No.</b>	DWG-0400-FSO-068	
<b>Cause of Overpressure</b>	B. D.	
Fluid phase (Liquid/Vapor)	----	STEAM
Actual Flow Rate	kg/hr	3000.00
Molecular Weight	kg/kgmol	18.02
Relieving Temperature	°C	600.00
Set Pressure	barg	80.00
Flowing Density	kg/m <sup>3</sup>	5.20
Flowing Viscosity	Cp	0.0100

Sizing Flow Rate

Required Flow Rate

Actual Flow Rate

<b>Inlet Line Fitting Data</b>		
Pipe Length	m	100
Nominal Pipe Size	inch	6
Pipe Schedule No.	-----	40
Pipe Roughness (DEF.)	inch	0.00180
<b>Fittings Quantity</b>		
* tee flow thru	no.	0
* tee branch	no.	0
* elbow 90 deg LR	no.	0
* elbow 90 deg screwed	no.	0
* elbow 45 deg LR	no.	0
* elbow 45 deg screwed	no.	0
* close pattern return bend	no.	0
* gate valve	no.	0
* ball valve	no.	0
* globe valve	no.	0
* angle valve	no.	0
* butterfly valve (2" - 8")	no.	0
* butterfly valve (10" - 14")	no.	0
* butterfly valve (16" - 24")	no.	0
* check valve swing	no.	0
* check valve lift	no.	0
* check valve stop lift	no.	0
* check valve tilting disk	no.	0
* foot valve hinged disc	no.	0
* foot valve poppet disc	no.	0
* reducer / expander	no.	0
* entrance (projecting)	no.	0
* entrance (sharp-edged)	no.	0
* entrance (flush)	no.	0
* exit (projecting)	no.	0
* exit (sharp-edged)	no.	0
* exit (rounded)	no.	0

<b>Calculation Results</b>		
Pipe Internal Diameter	mm	154.05
Velocity	m/s	8.60
Reynolds No.	----	688720
Friction Factor	----	0.0157
Pipe Pressuer Loss	bar	0.019
Fitting Pressure Loss	bar	0.000
<b>Calcalatyed ΔP</b>	<b>bar</b>	<b>0.019</b>
<b>Allowable ΔP</b>	<b>bar</b>	<b>2.400</b>
<b>Statement</b>	<b>OK</b>	

<b>General Notes</b>