Page	Location	Correction (changes in **bold**)
1	2nd para., last sent.	Preparation of this book by the **Center for Chemical Process Safety (CCPS)** was in response to this need.
6	2nd para., 1st sent.	…variety of pressure relief devices, such as… {omit components}
7	1st para., 2nd sent.	…in general in CCPS (1989c and 1992). {omit and in API Standard 750}
13	3rd para., 3rd line	…important is proper testing**,** maintenance**, and** effective management of change.
15-129	Chapter 2 odd numbered page headings	RELIEF DESIGN CRITERIA **AND** STRATEGY {move **and**}
17	Penultimate para.	In summary**,** engineering judgment…
31	Table 2.3-2, 'Both fire exposure and other overpressurization scenarios' row, 'Staged or Additional Devices' column	10**5**
32	4th bullet, last line	…such as SuperChems™ for DIERS {omit Lite}
32	2nd para., last line	…by documented industrial experience **(Fauske, 1984a)**.
34	Last para., 1st sent.	**Compensation** for the effect…
41	§2.4.2.2 2nd para., last line	…increase in the **disc contact area**. {omit relief area}
43	2nd sent.	**Variations in the forces acting on the disc may result in oscillations or instability of the disc. There are other factors that can contribute to oscillations or instability of the disc, resulting from the dynamic response of the damped spring-mass disc system.** {replace second sentence}
43	2nd para., 1st sent.	Excessive friction losses in the piping from the vessel to the valve (inlet loss) **may** cause chatter. {omit are a}
49	2nd para., 1st sent.	…high set pressures **(Van Boskirk, 1982)**.
51	Table 2.4-1, 5th column heading	{omit *}
51	Table 2.4-1, 7th column heading	Consolidated **Outlet Area to Nozzle Area** Ratio {omit *}
80	§2.5.3 7th para., Penultimate sentence	…minimal piping**,** restrictions do apply.
103	Item 3c	Plugging **or** fouling
103	Item 3	Blocked **or** closed outlet(s)
145	§3.2.3.5, 3rd para.	…represents the net **volumetric discharge rate** through the emergency vent,…
157	§3.2.7.2, 1st para., 5th line	Equations (3.2-1) and (3.2-17), the **constant volume criteria** Equation (3.2-23)…

Page	Location	Correction (changes in **bold**)
166	C_0	C_0 = **Best fit** correlating parameter given by ***Churn-Turbulent*** ***Bubbly*** ***Homogeneous*** 1.5 1.2 1.01
168	§3.2.9.4 penultimate paragraph	$X_m\left(A_v G - j'_{g\infty}\rho_g A_x\right)$ **is the weight rate of vapor entering the vent due to the net upward flow of aerated liquid which is in addition to the vapor flow relative to the liquid necessary to swell the liquid to the top of the vessel.**
168	§3.2.9.4 last paragraph	$A_v G - j'_{g\infty}\rho_g A_x$ **is the weight rate of swelled liquid or aerated, two-phase vapor-liquid mixture entering the vent in addition to the vapor which must pass up through the liquid to just swell the liquid to the top of the vessel.**
269	Last sentence in the penultimate para.	…actual relief system devices, can be found in the **literature.**
286	Eqn. 4.2-2	$G_{\mathbf{0}} = \rho_n \left(-2\int_{P_1}^{P_2} \frac{dP}{\rho}\right)^{1/2}$
286	2nd para., 4th line	…g_c (**32.17** (lb_m ft) / lb_f sec^2),…
290	2nd para., 3rd line	…set pressure (based on the rated capacity at **3 psi or 10% overpressure**); **commonly called the** API 3% Rule.
292	Eqn. 4.2-17	$G_c = \sqrt{kP_0\rho_0\left(\frac{2}{k+1}\right)^{\frac{k+1}{k-1}}}$ {entire equation under radical}
295	3rd para.	**Balanced Bellows Valves:** {omit Relief valve sizing:}
298	§4.2.2, 1st para., 2nd line	…homogeneous flow**,** meaning that…
298	§4.2.2, 2nd para., 6th line	…holdup**,** or mass fraction of liquid**,** within…
299	3rd para.	(Homogeneous – Non-Equilibrium Model – HNE) {omit Q}
303	Eqn. 4.2-41 Definitions	$\boldsymbol{v}_{f0}$ = stagnation liquid specific volume
303	Eqn. 4.2-41 Definitions	$\boldsymbol{v}_{fg_0}$ = stagnation specific volume difference = $v_{g0} - v_{f0}$
309	Below Eqn. 4.2-53	…choked flow gas/vapor mass flux: {omit equation}
310	§4.2.3 6th line	…flow regime**,** independent of…
312	Eqn. 4.2-17	$G_c = \sqrt{kP_0\rho_0\left(\frac{2}{k+1}\right)^{\frac{k+1}{k-1}}}$ {entire equation under radical}
312	1st para., last line	…friction loss, which is **not accounted for in the isentropic model)**.
312	§4.2.3.3, 3rd para., 2nd sent.	…values can **be as high as** 0.975 for a…
315	2nd para., 3rd sent.	…$P_e = P^*_e > P_b$**, where P_b** is the…
315	§4.2.4.1, 1st para., 2nd sent.	…discharge pipe to 10 percent **of the set pressure** (10% Rule)…
315	§4.2.4.1, 1st para., 3rd sent.	…backpressure of 12-13 percent **of the set pressure**.
316	*k* definition	$k = \boldsymbol{ideal\ gas}\ C_p/C_v\ ratio$

Page	Location	Correction (changes in **bold**)
316	1st para.	If (P_e – $P_{\mathbf{atm}}$) > 0.1 P_{set}…
319	1st para., 3rd sent.	…gas flow **(k = 1.4)**.
321	1st para., 4th line	…in a vessel at stagnation… {omit or vessel}
321	2nd para., 1st sent.	…from a process or storage vessel through the inlet… {omit or vessel}
326	3rd para., 1st sent.	The loss coefficient for **a square entrance** to a pipe…
326	5th para., last sent.	…as a fu**n**ction of Reynolds numbers…
327	Table 4.4-2 all N subscripts	N_{Re_l}
329	Para. Below Eqn. 4.4-12	…pipeline and *KE* (kinetic energy **correction factor**) = 1…
330	Line after Eqn. 4.4-17	…is needed to evaluate $\boldsymbol{\rho_1}$ and the average…
331	3rd para., 1st line	The effect of **the change in** kinetic energy…
331	4th para. Heading	**Adiabatic Compressible Choked Flow:** {omit Flow}
332	4th para. Heading	**Adiabatic Compressible Flow from Container or Vessel Through Pipe:**
336	4th para.	As well as Δv, the **increase in** specific volume…
339	2nd line after Eqn. 4.4-34	…is **calculated** using…
348	§4.4.9, 2nd para.	$H + \frac{\boldsymbol{u}^2}{2} + gz = const.$
349	Eqn. 4.4-73	$T_n = T_0 \eta_n^{\frac{k-1}{k}} + \frac{\sum K_f}{c_v} \int u du = T_0 \eta_n^{\frac{k-1}{k}} + \frac{\mathbf{1}}{\mathbf{2}} \frac{\sum K_f G^2}{c_v} (\boldsymbol{v_n^2} - \boldsymbol{v_0^2})$
356	1st para.	{omit last sentence}
369	Table 5.6-1 six instances	Best estimate of $K_{\boldsymbol{R}}$
387	1st para.	…class 150 flanges…class 300 flanges… {omit lb}
453	2nd para., 2nd line	…equal to 0.27 ft/s (0.0823 m/s)… {omit a zero following decimal}
454	Eqn. 7.4.2-2	$\boldsymbol{u}_e = K_g \left[\left(\mathbf{32.174} (2.2046E-3) \sigma (\rho_f - \rho_g) \right) / \left(\rho_g^2 \right) \right]^{1/4}$
454	Below Eqn. 7.4.2-2	$\boldsymbol{u}_e = ft/sec$
454	2nd line	g = the **acceleration due to** gravity; 9.8 m/s² {omit constant}
454	Dimensionless viscosity number equation	$N_\mu = \frac{\mu_f}{\left(\rho_f \sigma \sqrt{\frac{\sigma}{g(\rho_f - \rho_g)}} \right)^{\mathbf{1/2}}}$
556	Table B.3-1	Insert table shown below
664	Figure D.5.3-1	Reverse direction of Force arrowheads
666	Figure D.5.3-2	Reverse direction of Force arrowheads
667	Figure D.5.4-1	Reverse direction of Force arrowheads
669	Figure D.5.4-3, Row 5, ES	0.0**0**18 (See Figure Below)
669	Figure D.5.4-4, Row 5, ES	0.0**0**18 (See Figure Below)

Page	Location	Correction (changes in **bold**)
670	Figure D.5.5-1	Reverse direction of Force arrowheads
670	3rd para., last line	Equation (D.5.3-**2**)
671	2nd eqn., below figure	$\frac{3.4\mathbf{47}}{1.3}\sqrt{2(1.3+1)} = 5.687$
673	Figure D.5.6-1	Reverse direction of Force arrowheads
675	Figure D.5.7-1	Reverse direction of Force arrowheads
675	2nd para.	The relief piping discharge line friction loss in velocity heads is calculated below **using the Darcy-Weissbach friction factor of 0.015**.
678	Figure D.5.8-1	Reverse direction of Force arrowheads
678	1st para. Insert second sentence	**The upstream pressure is 124.7 psia, which exceeds the saturation pressure of 109.0 psia, making the stream slightly subcooled.**
678	2nd para.	The relief piping discharge line friction loss in velocity heads is calculated below **using the Darcy-Weissbach friction factor of 0.015**.
743	Index	Page numbers revised (See Pages Below)

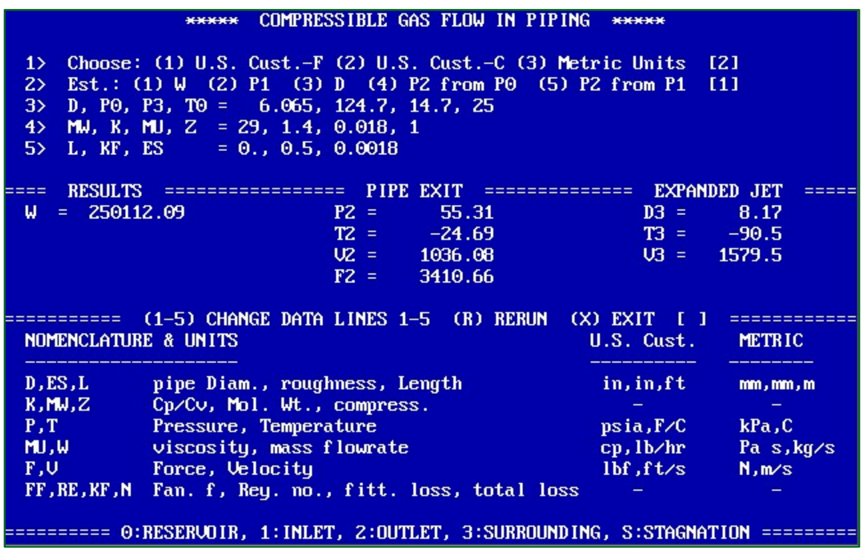

FIGURE D.5.4-3. Transient Force from COMFLOW (Correct **ES**)

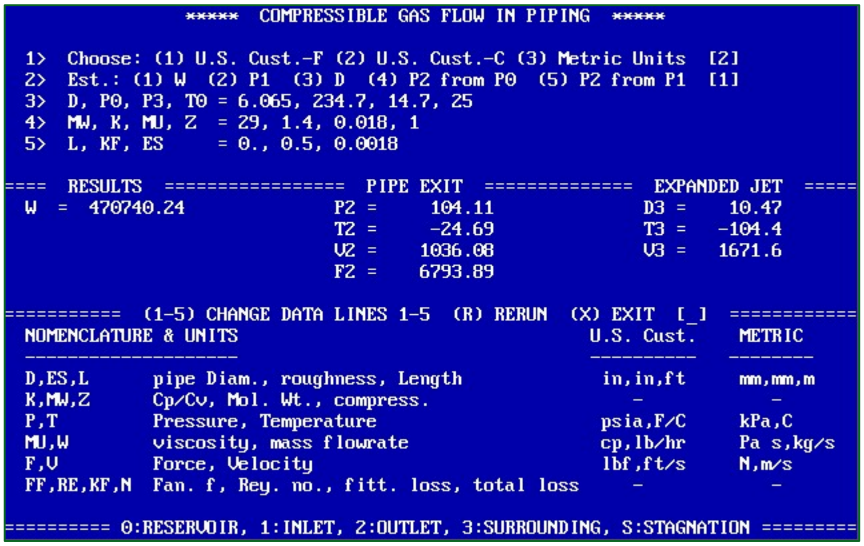

FIGURE D.5.4-4. Tension Force from COMFLOW (Correct **ES**)

TABLE B.3-1. Input/Output Variables: Nomenclature and Units

Input or Output	Variables		English-1	English-2	Metric-3
I	AN	Nozzle area	in²	in²	mm²
I	CPL	Liquid specific heat	Btu/lb/°F	Btu/lb/°F	J/kg/K
I	D	Diameter	in	in	mm
I	dH	Elevation difference	ft	ft	m
I	ES	Sand roughness	in	in	mm
O	G	Mass velocity	lb/s/ft²	lb/hr/in²	kg/s/m²
I	HFG	Heat of vaporization	Btu/lb	Btu/lb	J/kg
I	K	Nozzle flow coefficient	-	-	-
I	L	Length of pipe	ft	ft	m
I	MF	Laminar loss coefficient	-	-	-
I	KF	Fitting and pipe loss coefficient	-	-	-
I,O	N	Total loss coefficient	-	-	-
I,O	P	Pressure, thrust/area	psia	psia	kPa
I	R	Fluid density	lb/ft³	lb/ft³	kg/m³
I,O	T	Temperature	°F	°F	°C
O	V	Velocity	ft/s	ft/s	m/s
I,O	W	Mass flow rate	lb/s	lb/hr	kg/s
I,O	X	Weight fraction gas	-	-	-
I	Z	Viscosity	cp	cp	Pa·s
SUBSCRIPTS					
0	Reservoir				
1	Entrance				
2	Exit Plane of Pipe or Nozzle				
3	Surrounding, I.E., Downstream of Pipe or Nozzle				
A-C	Property Data Set				
G	Gas				
L	Liquid				
FILE INPUT SWITCHES (OPTIONS)					
IC	Problem Type: 1 = Find Flow Rate, 2 = Find Back Pressure, 3 = Advanced User				
IPTS	Choice of Property Model				
IU	Choice of Above Units: 1,2 = English, 3=SI				
IV	Options: 1 = Simple Non-viscous Input 2 = Nozzle Input: Area, Flow Coefficient, and Viscosities -2 = Same as IV = 2, but no viscosity entry (1) 3 = Pipe Input: Diameter, Length, Fitting Losses, and Viscosities -3 = Same as IV = 3, but no viscosity entry (1)				

(1) When IV = -2 or -3, no viscosity data are entered. HEM defaults to a value of 1 cP (0.001 Pa·s) for the liquid and 0.018 cP (0.000018 Pa·s) for the gas

Options 2 and 3 available with data file input option (but not with option of keyboard input during program execution)

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