

Why process safety incidents still occur: a top ten...



“Creating a better world by making processes safer and more efficient”



Process Safety

make invisible process safety risk visible and implement corrective actions to minimize the risk



Technology Transfer

close the process engineering gap between technology providers and the process industry



Process Optimization

expose energy- and production losses and implement corrective actions to reduce energy consumption and/or optimize product yield

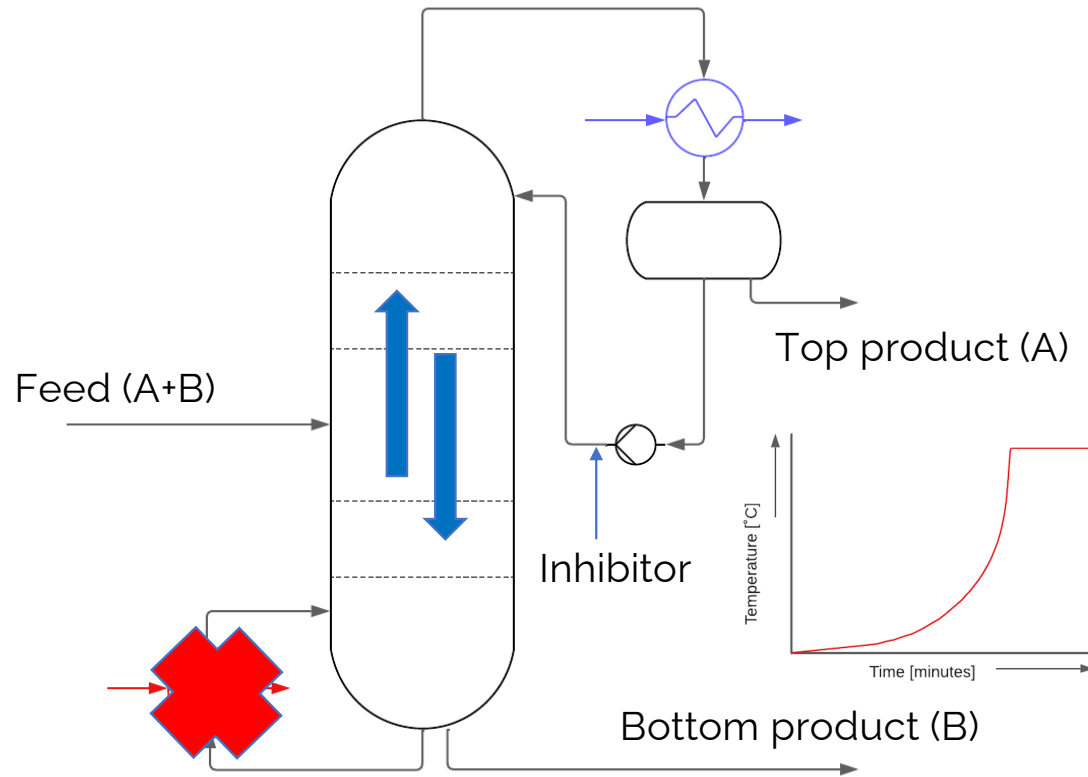
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why....



Enrico Lammers





Mission

We create value for our customers by making their invisible **process safety risks** and **energy or production losses** visible. This allows targeted actions to be taken to reduce these risks and optimize the plant performance



PS incidents still occur

FIGURE 1 DISTRIBUTION OF THE 100 LARGEST LOSSES BY YEAR
Source: Marsh Research

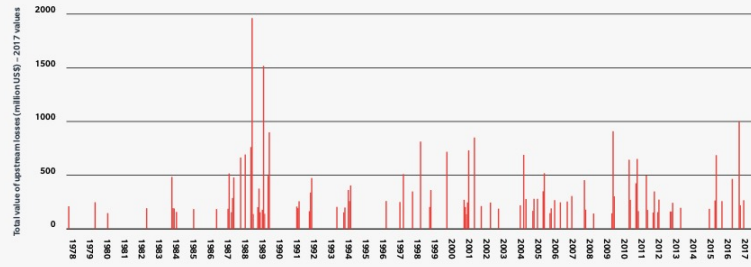
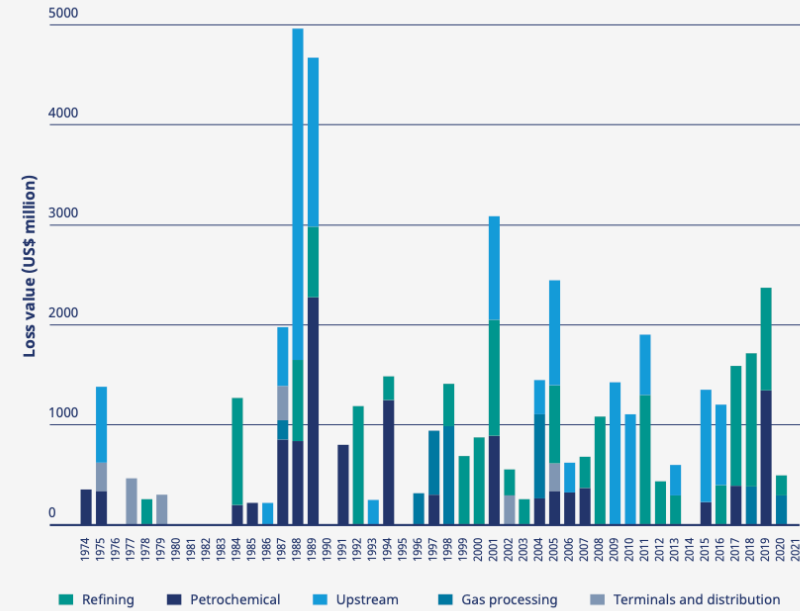
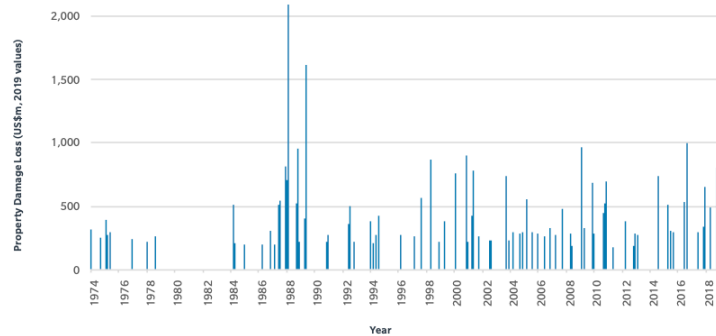
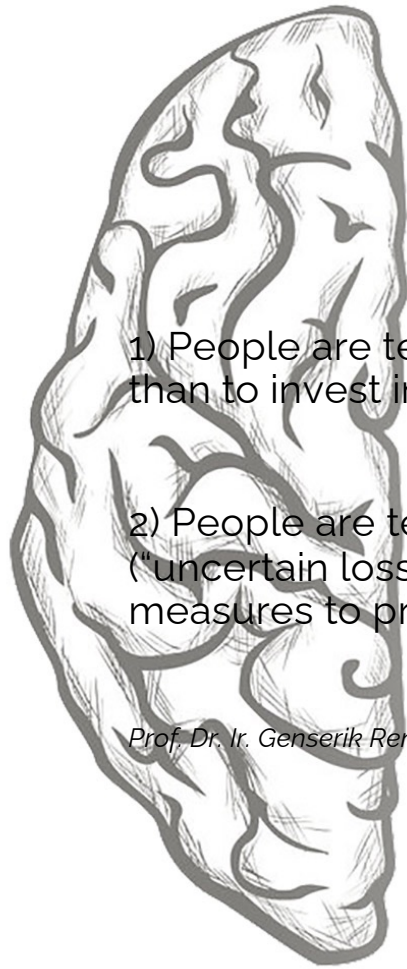


FIGURE 14 The two largest-ever losses still date from the period 1988-89.
SOURCE: MARSH



Source: Marsh Ltd.





1) People are tending more to invest in production (“certain profits”) than to invest in prevention (“uncertain profits”)

2) People are tending more to accept highly uncertain accidents (“uncertain losses”) than to make large investments (“certain losses”) in measures to prevent such accidents

1 Pre-occupied mindset

Prof. Dr. Ir. Genserik Reniers, Full Professor Safety of Hazardous Materials, Delft University



The inspection team inspected **19.000** piping points and **21.000** equipment points!



TRUE



Fig.1 Defecte drainafsluiter

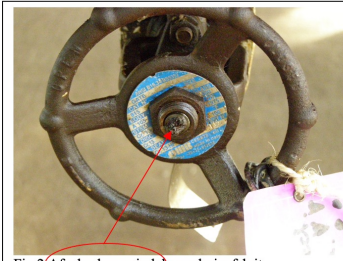
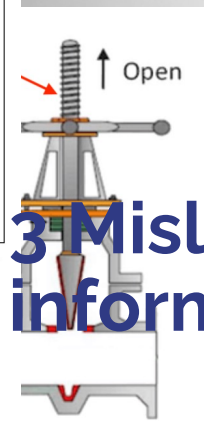


Fig.2 (Afgebroken spindel) van drainafsluiter



3 Misleading information

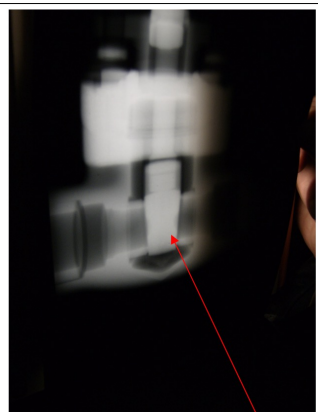


Fig. 3 Normale 1'' drainafsluiter, met gesloten schuif

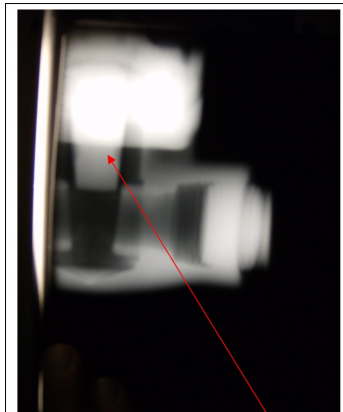


Fig. 4 Defecte 1'' drainafsluiter, met geopende schuif

FALSE

FALSE



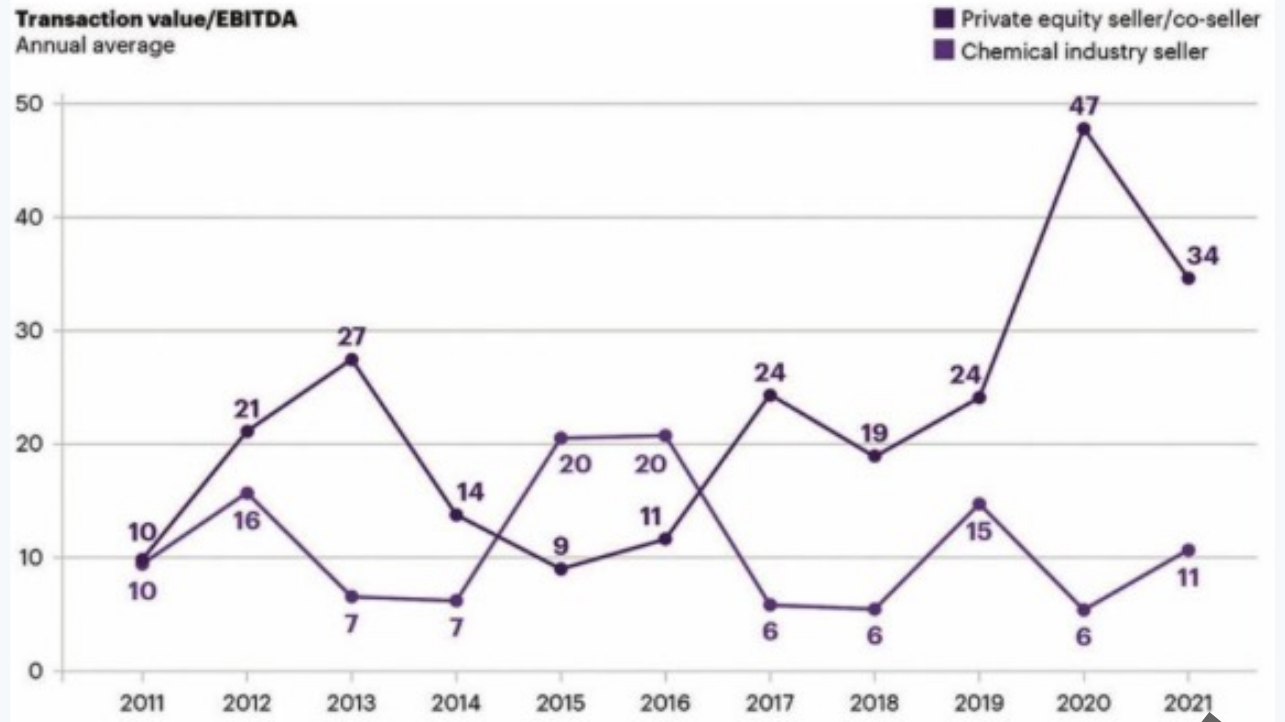


**4 (re)modification
of standards
without MOC**



5 private equity

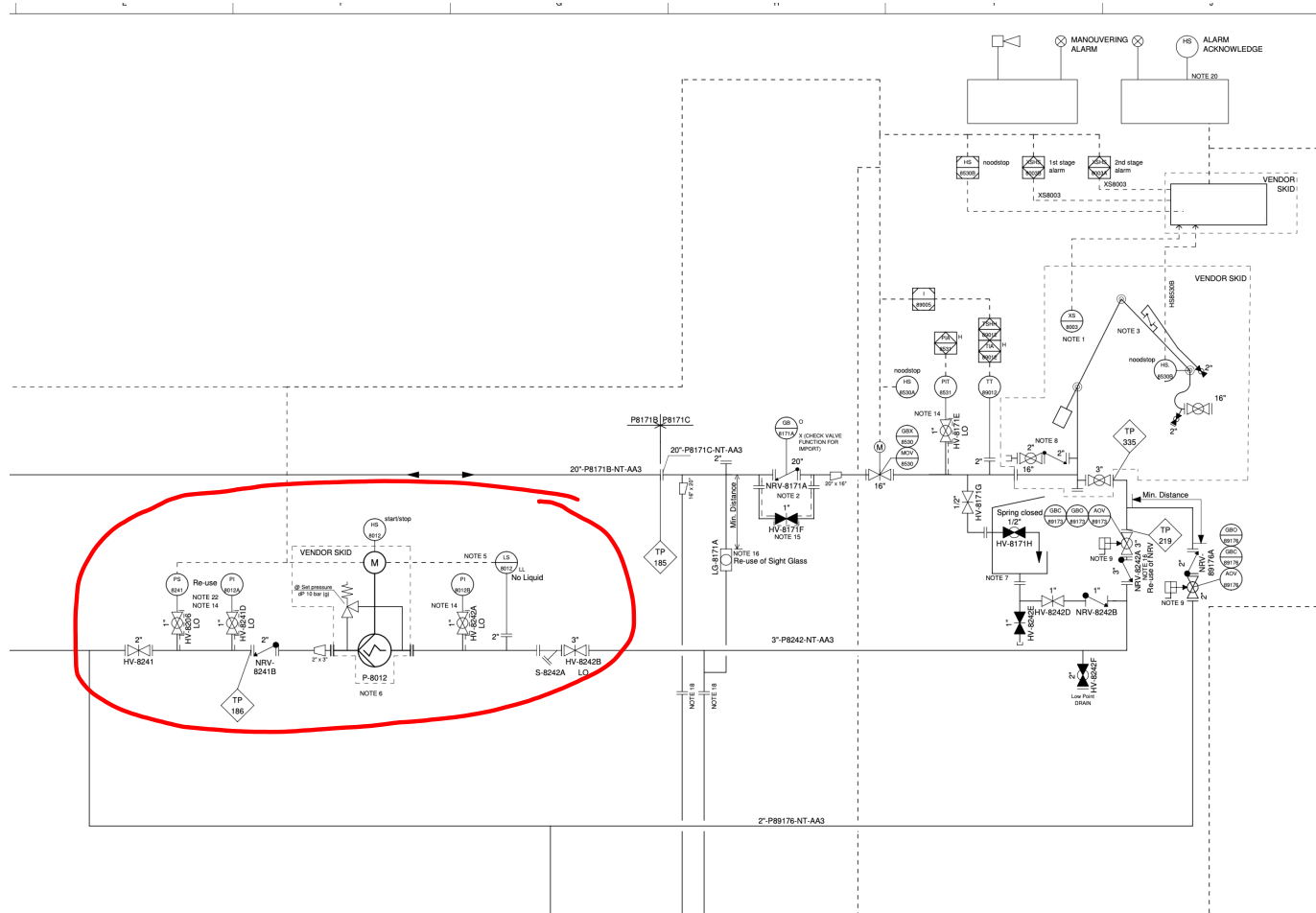
Transaction value/EBITDA
Annual average



Source: Accenture Research analysis based on S&P Capital IQ Pro data; includes chemical industry M&A transactions ≥ US\$200 million completed 2011-2021



6 Normalisation of deviation



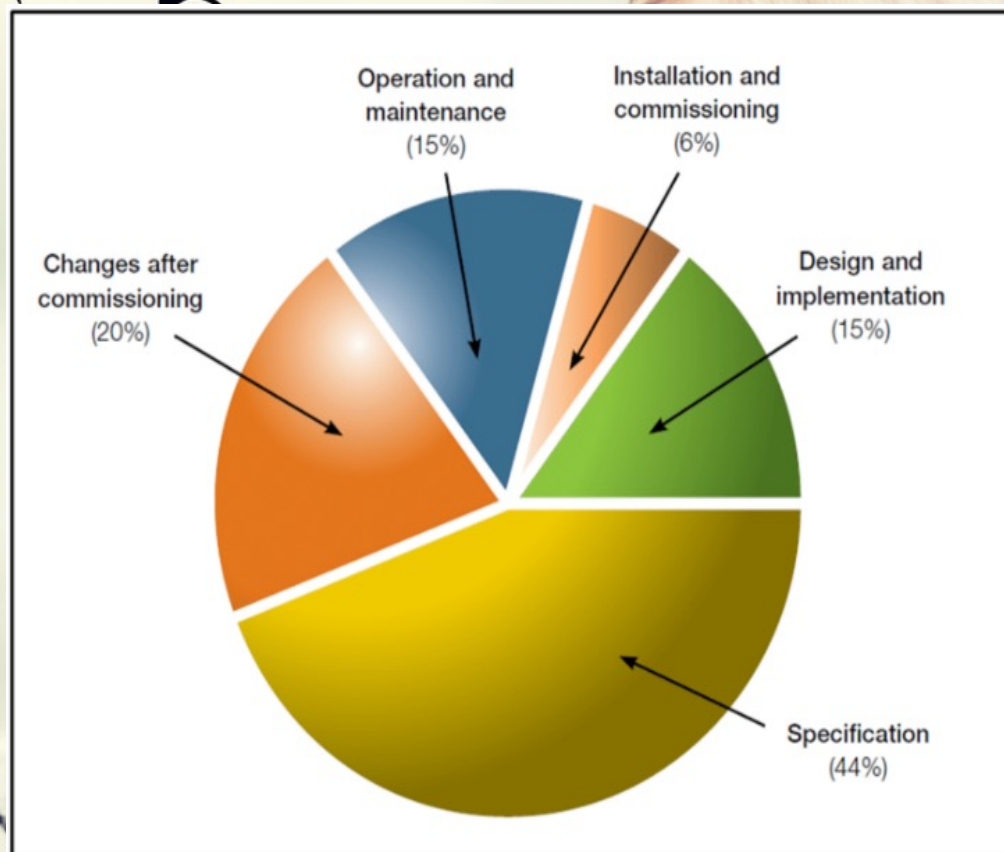
WATER, RELATIVE LOW PRESSURE, AMBIENT TEMPERATURE

54,982



ed
on
AZOP's



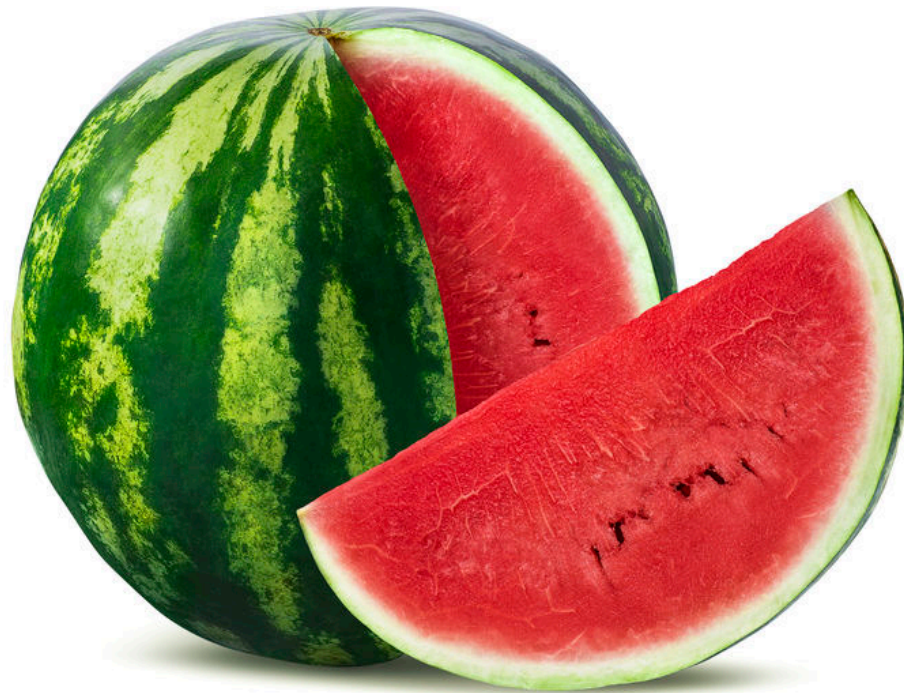


8 Incorrect specification

*Health and Safety Executive,
Out of Control – Why Control
System go wrong and how to
prevent Failure – 2nd Edition
2003 – Page 31*



9 Watermelon effect





	5100
AANTAL DAGEN SINDS LAATSTE	
ONGEVAL MET VERZUIM	541
ONGEVAL MET LETSEL	1285
MELDING GEVAARLIJKE SITUATIE	322
KEER NIET DRAGEN VAN JUISTE PBM'S	977
PERSONAL SAFETY	

	5100
AANTAL DAGEN SINDS LAATSTE	
LEKKAGE	541
TE LAAT GETESTE INTERLOCK	1285
TE LAAT AFGEMELDE PHE AANBEVELINGEN	322
TE LAAT UITGEVOERDE ONDERHOUDSTAAK	977
PROCESS SAFETY	



You were a wonderful audience,
Actually you were the most
wonderful audience I've ever
had...

Hans Liberg

