



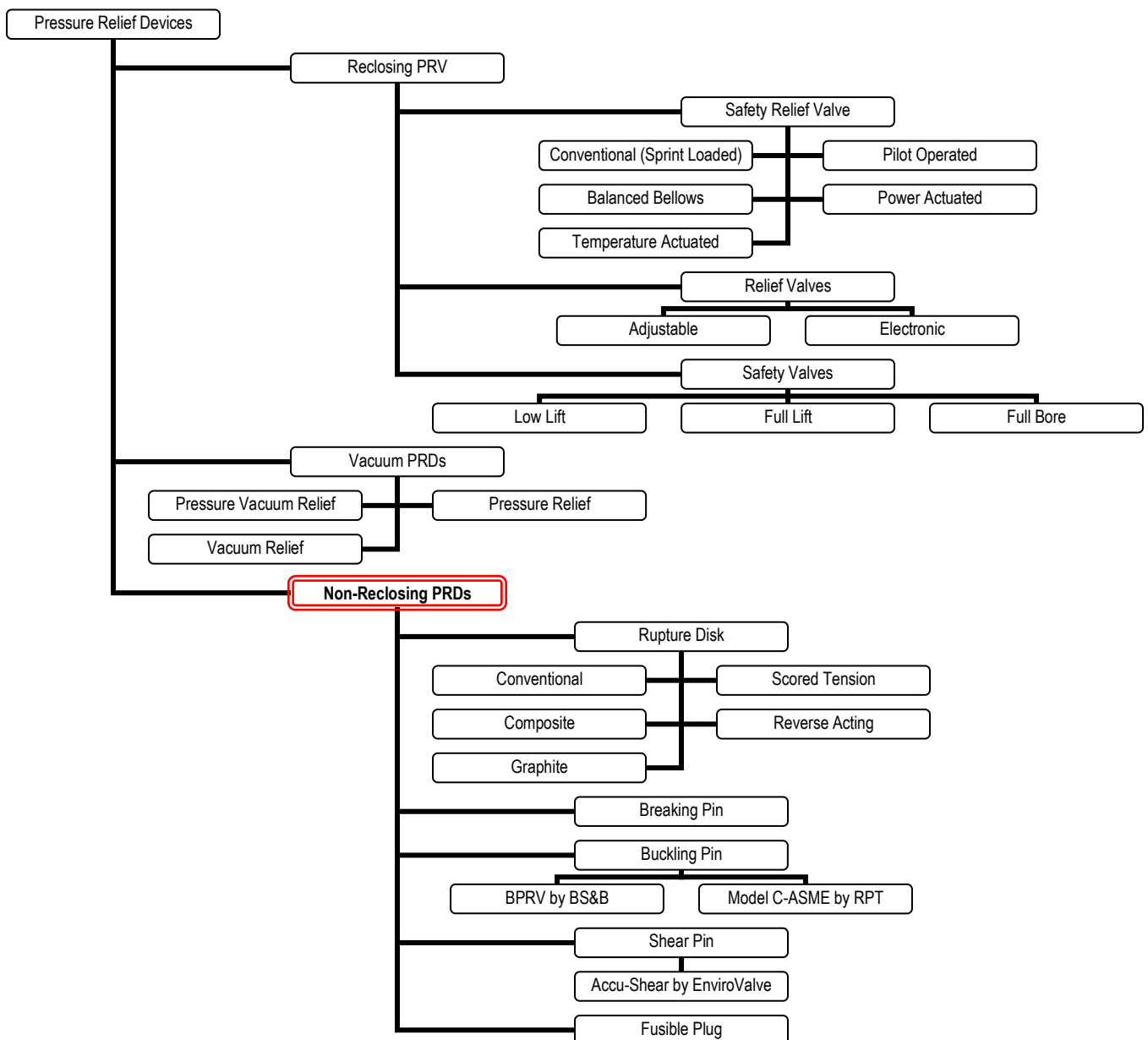
## Accuracy of ASME Non-Reclosing Pressure Relief Devices (PRDs)

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### BACKGROUND

Many types of pressure relieving devices (PRDs) and pressure relieving valves (PRVs) exist beyond the non-reclosing type, all of which are outlined in the figure below.





This paper will take a detailed look at the accuracy required of certified (ASME UD Stamped) devices in the non-reclosing sub-group of pressure relief devices. A nonreclosing pressure relief device is a pressure relief device which remains open after operation. A manual means of resetting is usually provided. (Ref. *Pressure Relief Devices* by Malek p. 14). These type of devices typically provide an immediate relief capability and the ability to operate close to their set pressure with minimal to no leakage and are often chosen for applications with relatively low pressure.

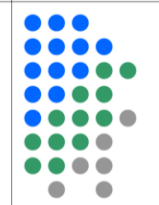
There are two broad categories of these devices, rupture discs and pin devices. The rupture discs operate by having a disc obstructing the flow until a set differential pressure is reached at which point the disc 'ruptures' allowing pressure to be relieved. Alternatively pin devices operate by using a pin to hold a valve style device closed. When pressure reaches the set pressure the pin buckles, shears or breaks allowing the device to open.

Though more economical up front, resetting a rupture disc can be cost and time intensive requiring the opening of the line and the purchase of a new disc whereas the use of pin devices, while more costly up front, can be rather quick and inexpensive to reset due to their design.

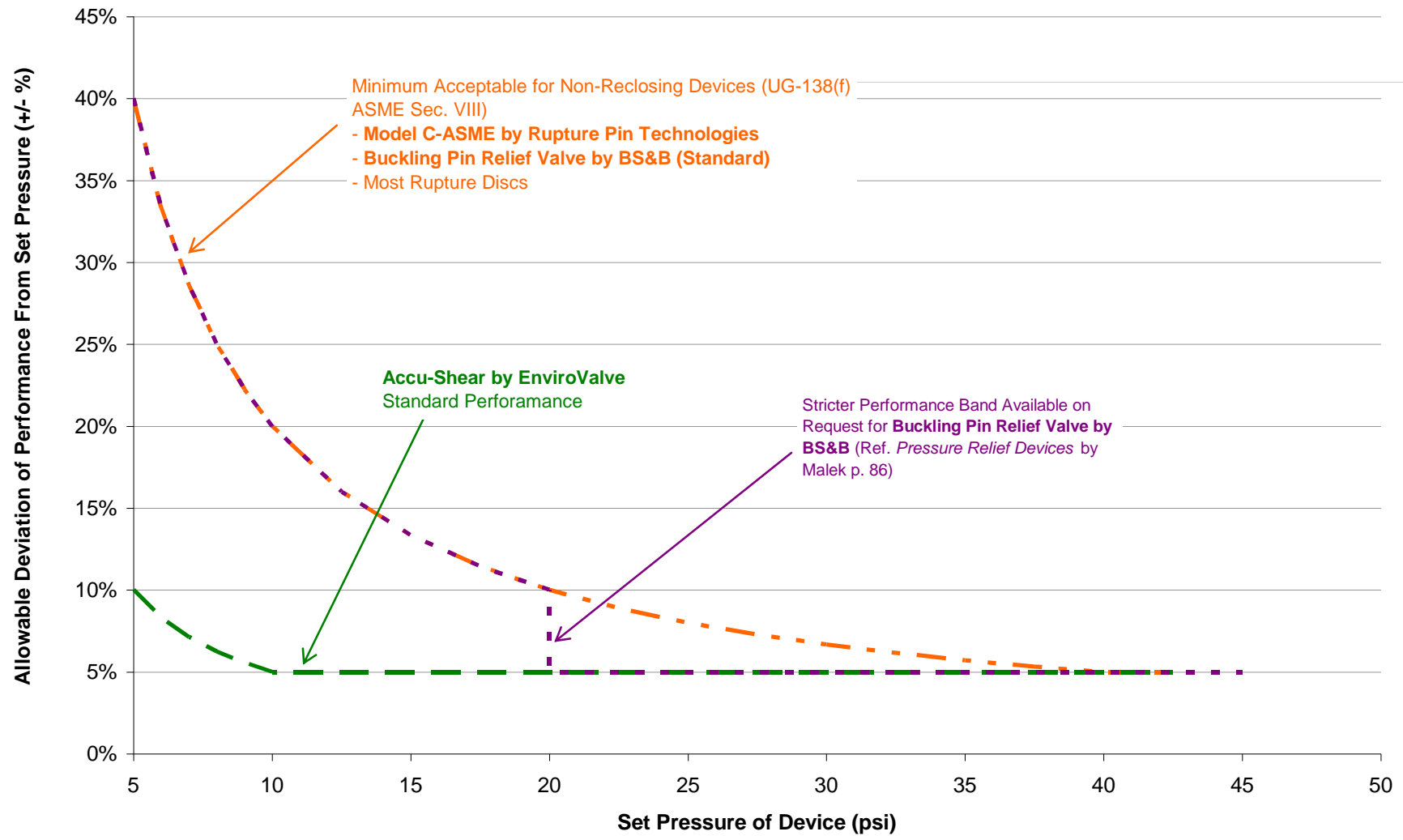
## ACCURACY ANALYSIS

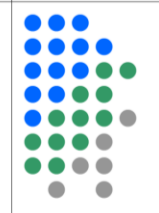
There are three widely available ASME certified pin devices on the American market along with a variety of rupture discs. The pin devices are the *Model C-ASME™* manufactured by Rupture Pin Technologies (RPT), the *Buckling Pin Relief Valve™* manufactured by BS&B and the *Accu-Shear®* manufactured by EnviroValve. All of these devices can receive a ASME UD designation by their respective manufacture upon shipping. The ASME UD designation means, among other things, that the device has been certified by the National board to meet a performance accuracy of +/- 2psi for set pressures below 40 psi and +/- 5% for pressure above 40 psi (Ref. ASME Sec. VIII UG-138(f)). Each product can be manufactured to this accuracy requirement or something stricter. Rupture Pin Technologies provides products with performance equal to the ASME requirement for all of their UD stamped products, BS&B matches the ASME standards as well for their standard product allowing consumers to select a stricter requirement of +/-5% for set pressures between 20 psi and 40 psi rather than the more generous +/- 2 psi required by ASME, EnviroValve also chooses a stricter performance requirement than ASME by holding their Accu-Shear product to a +/- 5% for set pressures above 10 psi and +/- 0.5 psi for pressure between 5 & 10 psi.

It should be noted for customers that accuracy (performance bands) stricter than those of the ASME requirements have not been certified by the 3rd party national board - only that the products meet the requirements of Section VIII of the ASME code. For performance above and beyond that of the code customers are encouraged to ask for test data to substantiate these claims from the manufactures. The charts on the following page outline what the different accuracy claims associated with the different products mean in real terms for different set pressures.



## Minimum Accuracy Required of Set Pressure for ASME UD-Stamped Devices vs Accu-Shear Stricter Specifications





## Acceptable Performance Band of Various Non-Reclosing Pressure Relief Devices versus Set Pressure

