Static Head – The Unrecognized Hazard in Relief System Design

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Allowable accumulation of pressure over the Maximum Allowable Working Pressure (MAWP) in relief system design is established in ASME Boiler and Pressure Vessel Code (BPVC) Section VIII, Division 1 and followed in API STD 520. This requirement is frequently simplified to a required relief rate at allowable relieving conditions, and the effect of liquid static head is often overlooked. Overfilling scenarios and overpressure scenarios for equipment operating liquid full can result in vessel pressure exceeding code allowable accumulation if relief valves are not set appropriately. This paper will address various but common static head problems from actual experience, ranging from the fairly obvious to the more subtle, and potential mitigation options will be presented.