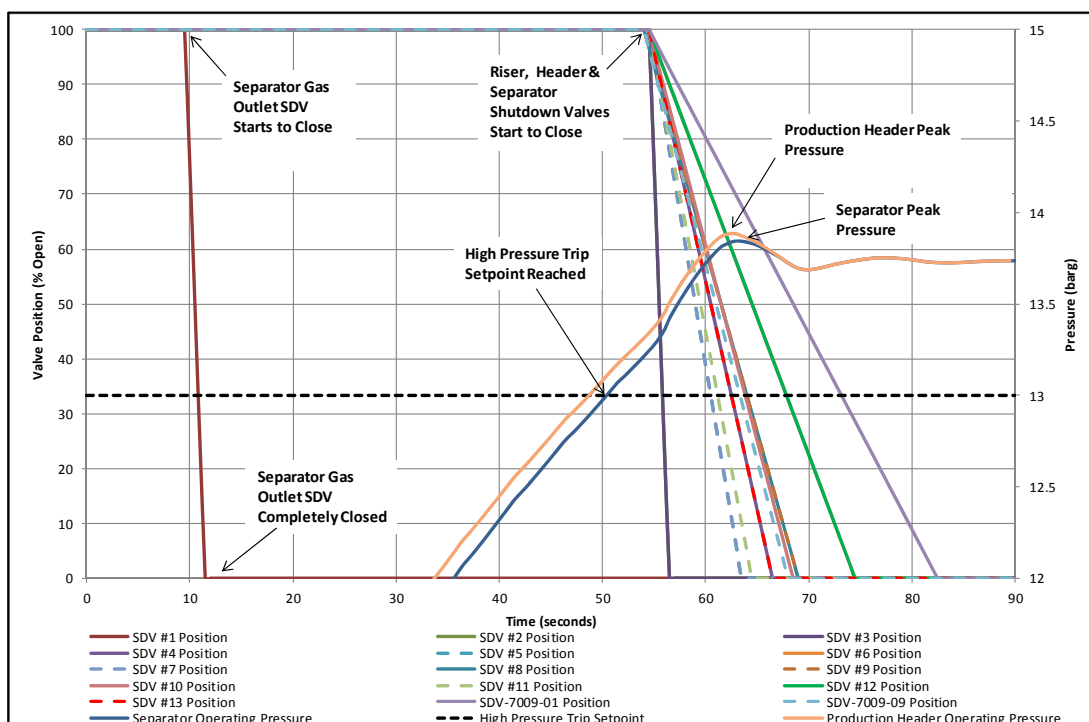


## Dynamic Simulation – Process Safety Time

**Challenge** To determine if the high pressure trip on an offshore production separator will protect the system from overpressure in the event of a blocked discharge when the separator is operating at an increased design rate.

**Assessment** A high pressure trip has been provided on an offshore production separator to detect high pressure in the system (i.e. due to blocked gas outlet line) and to initiate a platform shutdown. The platform shutdown will close the flowline and separator shut down valves, isolating the system. The time taken to detect the high pressure and return the system to a safe state is the required Process Safety Time (PST) of the high pressure trip.



During initial design the PST of the high pressure trip was determined for the system design rate. The operator now wishes to increase the design rate of fluid entering the separator and hence the ability of the high pressure trip to protect against overpressure may be compromised.

A review of the high pressure trip performance was conducted using Aspen HYSYS Dynamics™. The separator, flowlines, headers and shutdown valves were modelled in Aspen HYSYS Dynamics™ and the sudden closure of the separator gas outlet isolation valve was simulated to determine the peak pressure in the system and duration of any overpressure scenario. These values were compared to the applicable design codes and facility design philosophies to determine if the high pressure trip PST was acceptable at the increased rate or if the system required modification.

**Results** This study enabled the client to assess the performance of their existing system, to define the integrity limits of the system based on performance of available production wells. The results provided detailed input for production purposes and to define opportunities for system debottlenecking.

For more information on this type of assessment please contact us.