<h3>The Need</h3> A process developed by Scientific Design USA and used globally on Ethylene Oxide Plants. Huntsman chemical Corp, were in need of replacing 40 year old obsolete quick acting piston valves on Ethylene Oxide & Nitrogen process with Oxy cleaned St.St and Monel actuated ball valves. Paramount for the successful execution of the project and process, the selected actuated valve packages "must" achieve fail action times of sub 200 milliseconds (0.2sec) and air operating times of 1 second, including additional criteria for reliability and on time delivery. Cycle times were to be inspected by Huntsman and approved prior to release. <h3>The Solution</h3> Due to the critical nature of the process and specification, Pinnacle Valve Solutions P/L had performed a preliminary review and calculation process to ensure cycle times were achievable. Knowing the cycle times could be met, Pinnacle Valve Solutions then set about liaising with its O/S manufacturers Dafram Valves Italia and QTRCO Actuators USA, to ensure material compatibility at these cycle rates. Understanding the process and criteria, Dafram engineers recommended and offered their standard floating ball design ball valve model 300T & 600T with an upgrade (higher tensile strength) in material specification to the shaft only, all other materials in the design and manufacture of the valves where standard. Secondly, QTRCO USA reknown for its reliability and high cyclic actuators and compact design, where asked to evaluate this process and cycle times and recommend a suitable actuator to adapt to Dafram valves. QTRCO similarly to Dafram recommended its standard design QS series St.St Spring return Rack and Gear actuators with 17.7 St.St springs, however with larger ports. After manufacture and assembly of the actuators, QTRCO performed its own in house cycle test prior to shipment and the actuators alone achieved cycle times between 20-100 milliseconds. QTRCO were also asked to provide St.St mounting brackets & St.St drive couplings accordingly to ensure proper fit between valve/actuator. On arrival of valves and actuators, Pinnacle Valve Solutions set about assembling the complete package including the balance of equipment (solenoid valves, switchboxes and accessories). Once Assembly had taken place, Pinnacle valve Solutions set about cycle testing (with electronic timers) the complete valve assemblies. The cycle times achieved were on par and exceeded the theoretical calculated times undertaken prior to award. The result is as follows. - DN25 Class 300# Dafram / QTRCO actuated valve package = 26 – 41 milliseconds (0.026 - 0.041 sec). - DN25 Class 600# Dafram / QTRCO actuated valve package = 41 milliseconds (0.041 sec) - DN80 Class 300# Dafram / QTRCO actuated valve package = 117 milliseconds (0.117 sec) Final Inspection was performed by Huntsman Corp Engineers and approved for release. <h3>Conclusion</h3> Pinnacle Valve Solutions in conjunction with

its manufacturers Dafram and QTRCO delivered a valve/actuator and accessory package that met and exceeded client requirements and specifications. For any critical or general valve requirements, please do not hesitate to contact Pinnacle Valve Solutions for unsurpassed quality of service and products.