



TurboChyll TCO Optimizer Control System

From a position of design, a compressor's capacity control vane assembly will pre-rotate the inlet gas entering the varying downstream stages into a very efficient and dynamically optimized gas shape-affording control offering a significant capacity range. This feature is a highly efficient means to control over a great energy benefit however is limited to a region of about 60-100% vane opening. ***This optimized region of vane position is referred to as compressor pre-swirling.*** While the vane assembly can and will close further, regions below 45-50% present a significant impact to energy and stability. As the vanes are demanded to further close, a gas dampening rather than preswirling condition becomes ever more influential. These lower vane positions are simply not desirable to energy savings. Therefore a more efficient approach that will maintain the vanes in a region of pre-swirl, yet afford the turndown requirements would be considered highly favorable. The TurboChyll logic, via VST-OCP affords this feature.

When compressor lift (head) obligations are reduced, mostly through lower than design entering condenser water, gas flow can be afforded through the compressor with far less energy requirements. As a result, the VST functions via the compressor's turbine drive to a lesser more optimized output demand-conserving unnecessary HP and energy.

As the turbines continued intentful optimization and rerating occurs, the chillers water temperature logic is now obligated to maintain the leaving chilled fluid setpoint (LFS) by preswirling the vanes opened into the desirable region of optimization.. If however requirement (higher ECWT) or abnormally low capacity loads are encountered, both the compressors vanes and turbine output will correct with a priority to presented load.

