599a Avoiding Process over-Control and Process Plant Debottlenecking

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When a pilot plant or commercial plant does not operate as smoothly as we think it should or does not produce product meeting sales specification, we generally identify a process variable that is not loop controlled. We then install a control loop for that process variable, expecting improved process performance. In this way, many such plants become over-specified; ie, too many degrees of freedom are controlled, resulting in poor performance and/or poor stream factor. When a process is over-specified, there are an infinite number of "solutions" at which it can operate. When a process is under-specified, there is no "solution" for its operation. Process plants are essentially analog computers and defining and specifying the appropriate degrees of freedom for them is just as important as when working with a digital simulation of the process. This paper discusses process over-specification, how to avoid it, and how its resolution can lead to a virtual plant debottleneck.