

## How to Put ACE 3T Mistake Proofing into Your Standard Operating Procedures (SOP) to Optimise Your Taguchi Loss Function

### Abstract

*How to Put ACE 3T Mistake Proofing into SOPs to Optimise Your Taguchi Loss Function:* The least wasteful and maximum profit-making outcome of an activity can be described by the optimised region of its Taguchi Loss Function. By identifying the optimal outcome of a task and setting it as the target to be achieved in standard operating procedures (SOPs) you force innovation and continual improvement towards maximum operating profits. The Accuracy Controlled Enterprise (ACE) 3T error proof method of writing SOPs sets the optimal Taguchi Function Loss zone as the target you need to meet to control work to the optimal performance for maximum business profit.

**Keywords:** Taguchi Loss Function, Mistake Proof, Error Proof, Work Quality Assurance

The Taguchi Loss Function is a concept describing the loss to our societies and the world when a system or process is not operated at optimum performance. When any process or system operates it produces a range of outcomes. The distribution of the outcomes is termed the process variation. We want processes and systems that are centred on the optimal zone of their loss function while also producing the least variation. If we can achieve minimum loss in a process we automatically get maximum value from it.

Figure 1 shows the characteristics of a symmetrical loss function and how it is used to identify the losses and wastes that a system or process causes at different values of an adjustable parameter. Producing on either side of the optimal region leads to rapidly rising losses from such things as scrap and waste, rework, plant and machinery breakdowns, workplace stress, fatigue and many other unwanted outcomes.

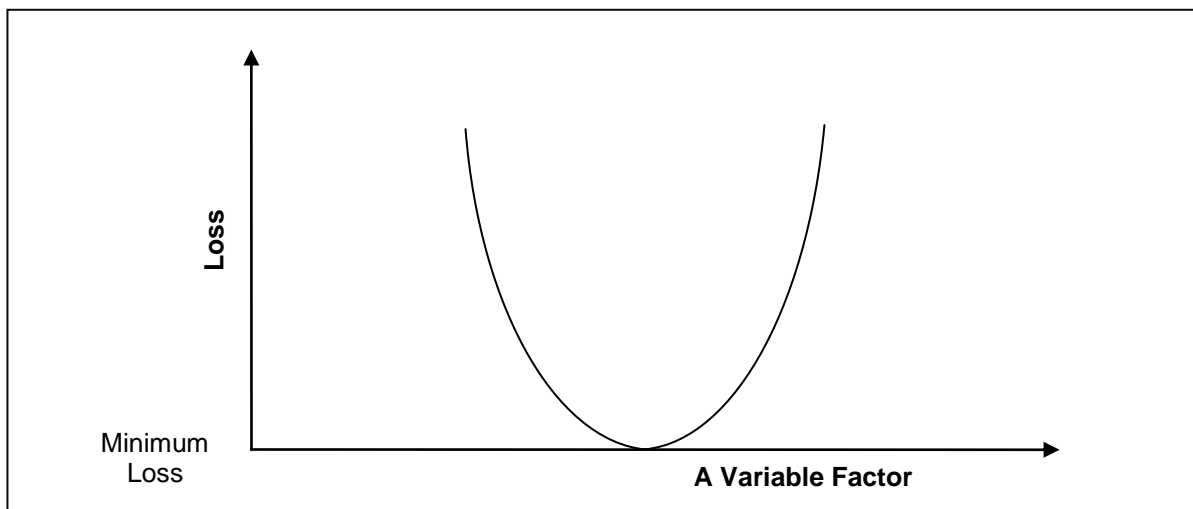


Figure 1 A Symmetrical Loss Function (often they are not symmetric)

When a process is away from its optimal operating zone it may still perform satisfactorily but it will not be its best possible results—value is left behind and forever lost. Figure 2 shows the range of a process' outcomes taking the form of a normal distribution. There are several other forms of distribution but a normal distribution is often found. In Figure 2 the process outputs are well off-centre and the business is suffering great losses and missing much profit because the process performance is far from the optimum.

This process is a candidate for improvement and it is well worth doing improvements if the process performance can be economically brought across to the minimum loss zone. There might be some very serious money to be made with some very simple changes.

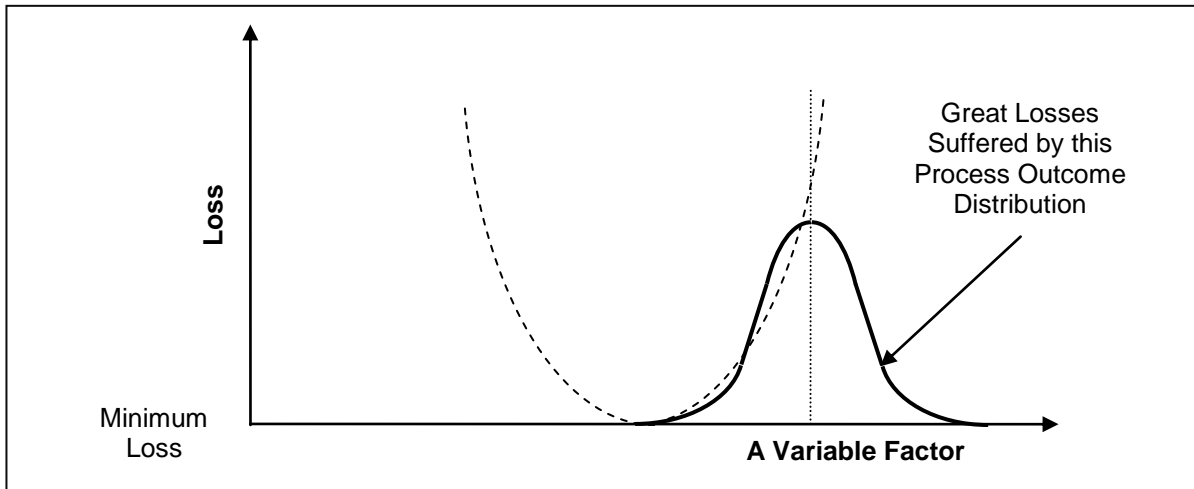


Figure 2 Distribution of Process Variation not Centred on the Minimal Loss

Figure 3 shows the process variation has been moved to the optimal zone by tuning the operating factor and improving the process control so as to cause the process outcomes to distribute around the loss optima.

This can be accomplished by use of Accuracy Controlled Enterprise (ACE) 3T error proofing standard operating procedures. The 3Ts are **Target – Tolerance – Test**. ACE 3T mistake proof procedures require you to specify the optimal loss zone as the Target outcome for each activity in a process task. By setting the Target as the optimal loss zone you create momentum and energy in the job to achieve those results.

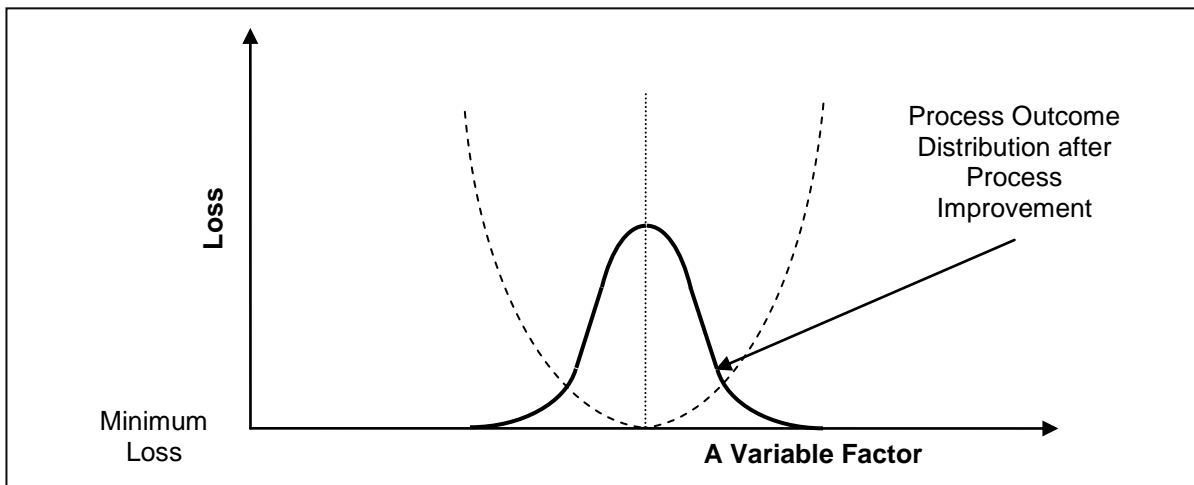


Figure 3 Distribution of Process Variation now Centred on the Minimal Loss

Figure 4 shows how the **Target** outcome is set in ACE 3T Mistake Proof SOPs to straddle the optimal loss area. The Target is called the ‘Best’ result to differentiate it from an acceptable result within Tolerance but not ideal. The **Tolerance** values are set at the maximum acceptable specification limits. Provided an outcome is within Tolerance it is ‘Good’ enough. Between Best and Good zones we define a ‘Better’ result as a stepping stone to guide people towards our optimal intent. The third ‘T’ is a proof **Test** to confirm where you are on the loss function. The further away from Best that you are the more loss in value and quality. If the proof Test shows that you are outside the Tolerance zone you must correct the problem and be within Tolerance as a minimum before continuing the job. The Test is the vital quality control step where error proofing occurs. If you are not within Tolerance it is an error and must be corrected before continuing.

Finally you squeeze every last bit of value out of the process by doing what is shown in Figure 5—reducing the process variations to always be within the optimal zone for maximum profit. The 3Ts error proof work and ensure a job is done optimally to maximise the benefits to the business, our society and the planet.

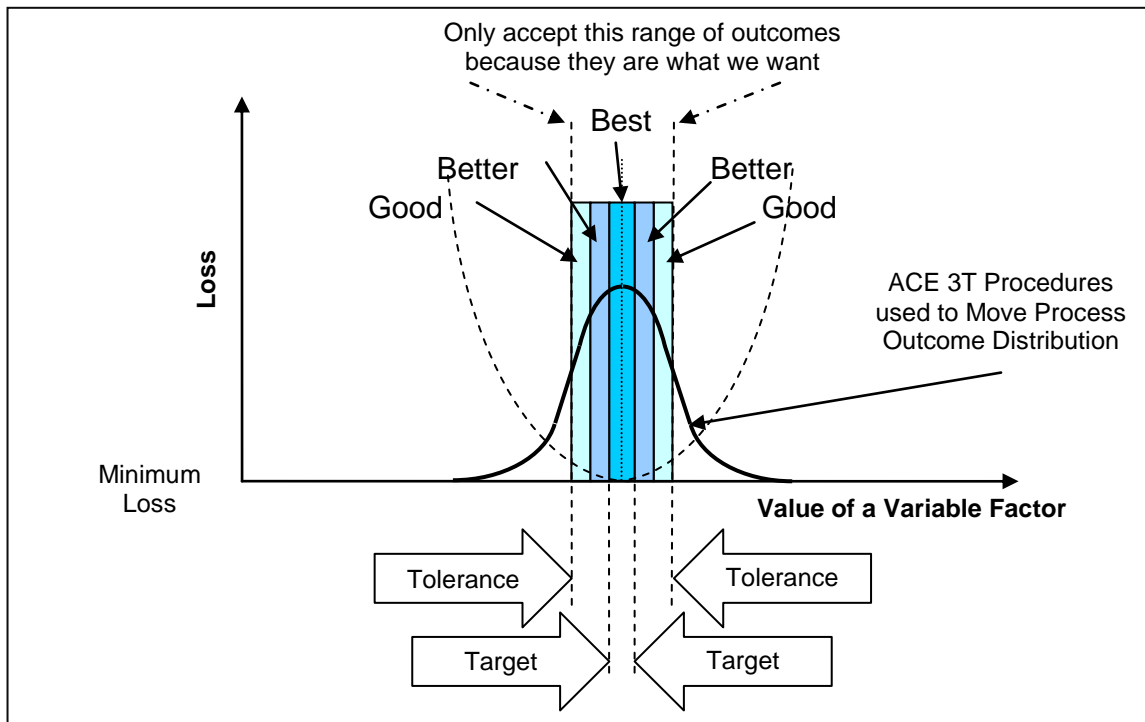


Figure 4 ACE 3T Procedure Sets the Minimal Loss Zone as the Target Outcome

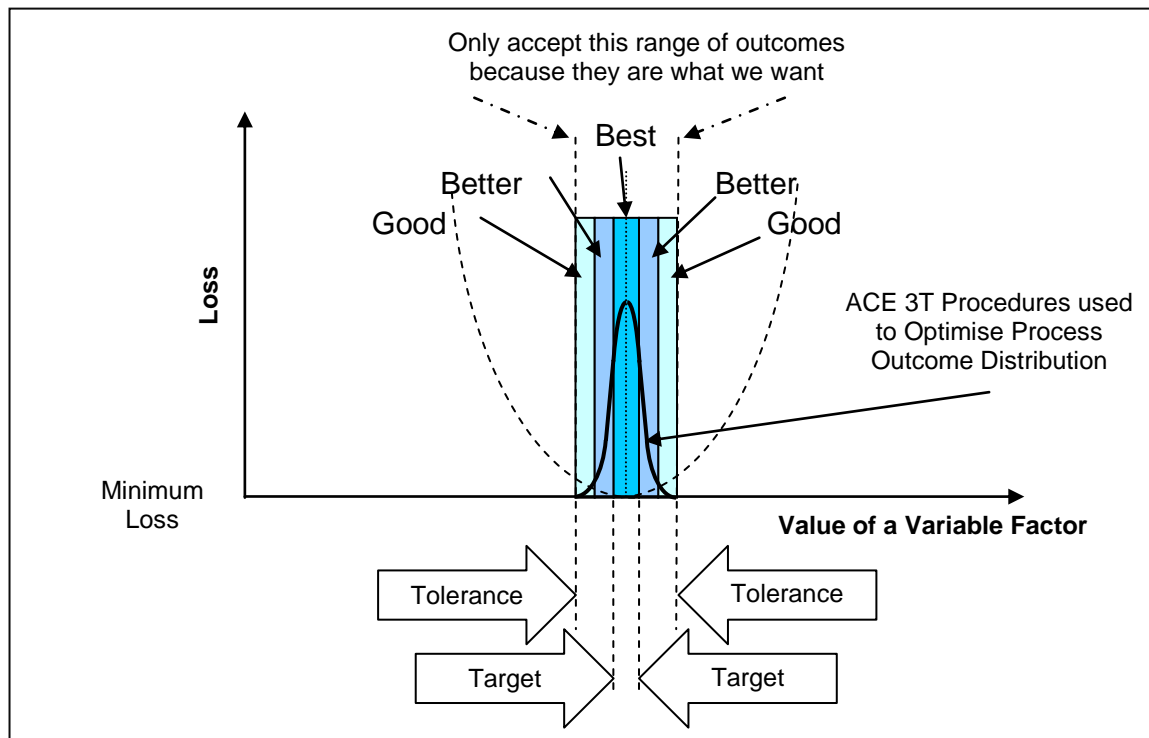


Figure 5 Reduce Process Variation so all Distribution is in the Minimal Loss Zone

Read more about 3T error proofing at [Moving to Quality Accuracy in Production and Maintenance](#) and see an example 3T mistake proof SOP at [ACE 3T Error Proof Procedure Plummer Block Example](#).

My best regards to you,

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