

## FMEA Severity Ratings

On an American Society for Quality site, a member posted the following question: "In FMEA, can severity change after recommended action has been taken? In my opinion it should because if the earlier score was higher due to a lethal life hazard then after counter action it should decline."

The post generated a large number of responses, most of which correctly advised that severity ratings can only change via change in design. One member wrote that "to mitigate risk does not alter the situation; only the possibility of occurrence." Other respondents, however, seemed to be confused about what FMEA's are all about and risk mitigation. They claimed that if you can mitigate or reduce the likelihood of a risk, it lowers the severity. I decided to add my two cents and posted:

I have always taught my clients that a severity rating can be reduced only through a change in design. Reducing the likelihood of occurrence of the failure mode does not eliminate the failure mode. After all, the severity of being shot in the head is the same whether it can happen in the next 24 hours or once in the next half-century. Only error-proofing the design and making the cause of the failure mode impossible to occur will result in a lower severity rating.

In a Machinery Design FMEA, one cause-failure mechanism was putting a tray of parts into an assembly machine with the parts in the wrong orientation (i.e., leaning forward instead of leaning back). This would result in an assembly jam, damage to the robot, and substantial downtime. The team reduced its occurrence rating via training and labeling, but the potential (and severity) of the failure mode remained.

Next, we added a "nub" to the side of the tray and a slot at the right side of the opening. It is impossible to insert the tray unless you mate the "nub" to the slot; impossible to have the parts in the wrong orientation; prevention of the cause-failure mechanism by design. Cause eliminated by design = lower severity rating.