

## Case Study 9: Quality control

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A production line engineer, Shane, checks every chip for quality control (QC). His workers find errors approximately every 150 chips. Either the defective chips must be sent back for repair or they must be thrown away. The manager, Rob, has mandated that workers must throw away all defective chips. Rob walks over to Shane's line and declares, "Why some lines sink more dollars into a chip that's failed, I don't understand. We only make 25 cents off each chip anyway! Spending an additional \$2.00 per chip will only be more money down the drain. Shane, in our line of work we can't afford to flush money down the toilet."

The following afternoon, Rob calls a meeting in his office. Rob informs Shane, that Shane's line is throwing away too many chips. "One chip every hundred and fifty is unacceptable! This is becoming a substantial cost to the company. I believe that it would be more beneficial to allow defective chips to go out the door." Shane asks, "What about the defective chips? Won't customers complain?" Rob replies, "Yeah, yeah, but that's not your problem, the company has a return department that will replace them as customers complain." Rob further estimates that allowing defective chips on the market will yield a \$416,000 profit for the company.

Questions:

1. What issues are involved in following Rob's recommendation?
2. Is it acceptable to follow Rob's suggested course of action?
3. If Shane has a differing opinion, how could he present his case to Rob?

Author's commentary

1. One major issue in the narrative above is deceiving the public, because the public is sold chips with no precautions taken to ensure their correct assembly. A second issue involved here could be public safety: what if the part is used to build a critical device such as a navigation computer for missiles or airplanes?
2. This answer depends is on the assumption made by the student. If the student perceives this issue as a safety issue, then it would clearly not be acceptable to follow the superior's suggested course of action. Moreover, this answer hinges on whether or not the student perceives this as a management

decision or an engineering decision. Again, this is decided by the assessment made by the student: Is this a safety issue? If the welfare of the public will not be compromised then this is decisively an economic decision which falls in the domain of a management. If however, the assumption is made that the chips involve public safety, this falls in the domain of engineering.

3. To present a differing opinion to a manager, it may be necessary to compromise. In this situation, economics can be powerful aid to the engineer. As demonstrated by the above calculations, the manager's estimates were for a best case scenario. Therefore, it can be asserted that actual profits should be less, especially if there is a return cost involved with the defective chips in terms of personnel, paper trails, and loss of reputation. It can be further asserted that by repairing the chips, the loss is significantly minimized in comparison to axing chips: the line is still profitable and the company's reputation for quality could help increase the overall corporate value. So, one creative middle way would be for the engineer to suggest the repair of all chips, and present his calculations to his boss in doing so. This solves the problem of the line losing money, turns a reasonable profit, and establishes a tradition of quality within the company.