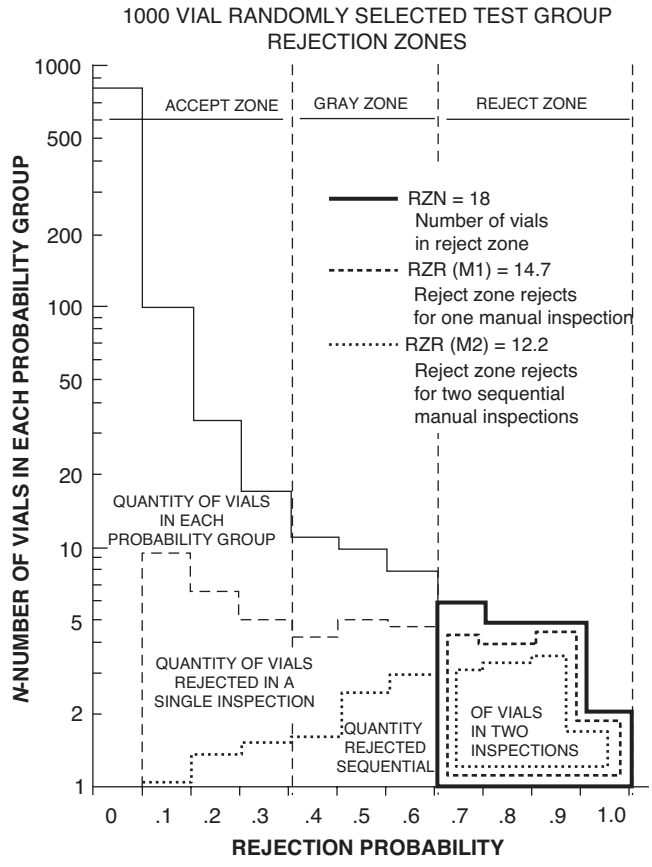

Figure 22-4 Histogram plotting number of vials per each probability of rejection group. *Source*: From Ref. 12.

Figure 22-4, Knapp and Kushner (12) defined three zones within the rejection probability limits of 0 and 1.

The accept zone contains all vials that have less than one chance in 10 of rejection in two sequential inspections. The reject zones contain all vials that have at least one chance in two of being rejected in two sequential inspections. The gray zone exists between the accept and reject zones. For single inspections, the probability limits for the three zones are seen in Figure 3.6 where

Accept zone $P \leq 0.3$
Gray zone $0.3 \leq P \leq 0.7$
Reject zone $P \geq 0.7$

Figure 22-4 also shows three terms abbreviated RZN, RZR (M1), and RZR (M2). The definitions of these terms are given in the figure (8). Using these terms a variety of parameters can be measured, including reject zone efficiency (RZE) and undesired reject rate (RAG). By definition, RZE = RZR/RZN. In the example given in Figure 22-4, the RZE after a single inspection is 81.7%. This means an 81.7% probability exists for a manual single inspection method to reject those vials known to exist in the reject zone. Matching or exceeding this objective measure of the security achieved by a manual parenteral inspection procedure should be the only GMP requirement for validation of any alternative inspection technique or process (13).