ABSTRACT. The problem considered is that of characterizing the best approximation, to a given x in a Hilbert space, from a set which is the intersection of a closed convex cone and a closed linear variety. This problem is shown to be equivalent to the (generally much simpler) problem of characterizing best approximations to a certain perturbation of x from the cone alone (or a subcone of the cone). Several applications to shape-preserving interpolation are given.