with the properties that

$$0 < p_G^0 < p_0 < p_R^0 < 1\,;$$

$$p_G^0 \to 0 \text{ as } \alpha \to 0\,;\; p_R^0 \to 1 \text{ as } \beta \to 0\,.$$

Decision-maker's optimal policy is

- Accept immediately, if $p < p_G^0$;
- Obtain Further Information [then Accept if Clear and Alarm if Flag] if $p_G^0 < p < p_R^0$;
- Alarm immediately if $p_R^0 < p$.

Thus, if Decision-maker is sufficiently confident that the state is Green ($p < p_G^0$) or Red ($p > p_R^0$), then the additional information is of no value, even though it is free. The information is so uncertain that the results could not change Decision-maker's mind (at least, not enough to alter Decision-maker's optimal course of action). Thus, information should be sought only when Decision-maker is relatively uncertain about the state, for only in that case can the information have a bearing on the action selected.

The three zones defined by Decision-maker's optimal policy for free information are shown along the "cost 0" line in Figure 4. Figure 4 also shows how the optimal policy is altered if the information costs Decision-maker an additional c units. (Note that information cost is assumed **fixed**, i.e. independent of the true state. A different assumption is made in the next section.)

Figure 4 shows geometrically the definitions of two new thresholds, p_G^c and p_R^c, that determine Decision-maker's optimal policy when the information has a direct cost of c units. This policy is

- Accept immediately if $p < p_G^c$;
- Obtain Further Information [then Accept if Clear and Alarm if Flag] if $p_G^c < p < p_R^c$;
- Alarm immediately if $p_R^c < p$.

This is shown along the "cost c" line in Figure 4. Note that as c increases, the zone in which information is sought becomes narrower and narrower, finally shrinking to a point at $p = p_0$, before disappearing altogether.

The same methodology, based on the principle of minimum expected cost, can be applied in more complex situations. Following is an illustration, based on the $L = 100$, $M = 40$, $F = 20$ example. Assume that satellite reconnaissance of a declared facility has these characteristics

Satellite: $\alpha_S = 0.4$, $\beta_S = 0.25$, $c_S = 0$;

(error-prone, but costless); while on-site inspection has these characteristics

On-Site: $\alpha_O = 0$, $\beta_O = 0$, $c_O = 8.0$;

(infallible, but costly). These two techniques can also be used in sequence; the On-Site Inspection may or may not take place, depending on the information from the Satellite Inspection. The two possibilities are Satellite-OSI if Clear and Satellite-OSI if Flag.* Their characteristics are

Satellite-OSI if Clear:
$\alpha_C = 0$, $\beta_C = 0.25$, $c_C = 3.2 + 2.8p$.

Satellite-OSI if Flag:
$\alpha_F = 0.4$, $\beta_F = 0$, $c_F = 4.8 - 2.8p$.

As shown in Figure 5, Decision-maker's optimal policy when faced with this choice is

- Accept immediately if $p < 0.076$;
- Satellite-OSI if Flag if $0.076 < p < 0.270$;
- On-Site Inspection only if $0.270 < p < 0.444$;
- Satellite-OSI if Clear if $0.444 < p < 0.783$; or
- Alarm immediately if $0.783 < p$.

Thus, if Green is likely enough, Decision-maker should Accept without waiting for more information. If Green is somewhat less likely, a satellite inspection, with a follow-up on-site inspection when there is an apparent violation, is best. As Decision-maker's assessment of the likelihood of Red increases, On-Site Inspection

* In the terminology of "New Research in Arms Control Verification Using Decision Theory," op. cit., these two inspection plans are called Sequential (Satellite, On-Site) Loose and Sequential (Satellite, On-Site) Tight, respectively (p. 14). There are no other useful ways of combining two binary tests sequentially.