What Do Shooting Down Enemy Airplanes and Solving Business Problems Have in Common? - Part 1

Published September 4 2009 8:4 AM

Introduction

Surprisingly, the answer to the question in the title of this post is "A Lot!"

Shooting down an enemy airplane is done by a weapons system that solves what is known as "the fire control problem." What I learned about solving the fire control problem while serving in the Navy has been of great value to me in solving the kinds of problems I have encountered in businesses and other organizations during my civilian career as a consultant and executive. The central point I'd like to make in this post is as follows:

Most problems encountered in organizations are dynamic. They are, as people so often say, "moving targets." There is not and can never be a static solution to a dynamic problem. The first lesson to be learned from the fire control problem is this: to hit a moving target requires a continuous or "running" solution, one that is regularly updated to reflect the current situation. Dynamic problems are not "defined" and then "solved." Instead, the definition of this kind of problem evolves over time as does its solution. Dynamic problems must be measured and monitored, just as targets are tracked. If you do not approach dynamic problems in this fashion, you are likely to solve the problem that *was*, not the problem that *is*.
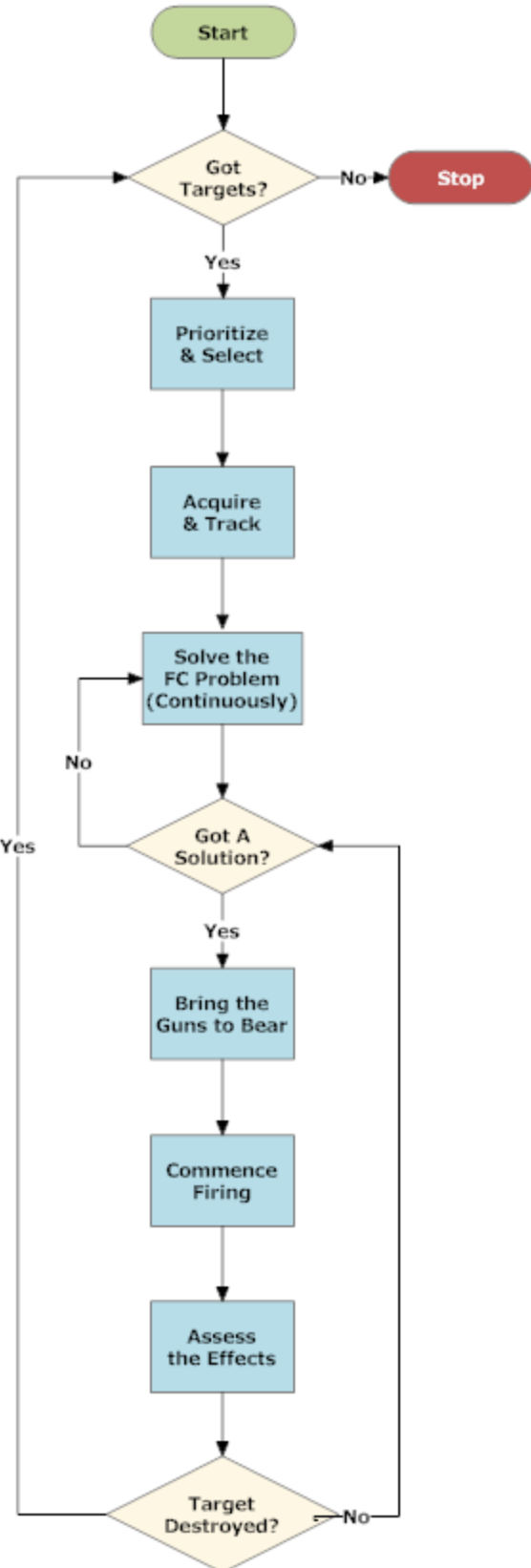

Figure 1: The Fire Control Problem

Solving the Fire Control Problem

With the exception of stationary targets ashore, the basic problem to be solved is that of hitting a moving target, of putting a projectile or some other explosive device where the target *will* be – and to do so from a platform that is itself in motion. The calculations involved in performing this feat constitute what is known as "the fire control problem." The flowchart in Figure 1 illustrates the basic process of taking a moving target under fire and, if all goes well, of destroying or disabling it. A guided tour of this process follows.

Got Targets?

A target might be a convoy, an ammo dump, a bridge, a road, a concentration of enemy troops, an enemy ship, an enemy aircraft or even a missile. Except in actual combat or during training exercises, there are no targets. But, once the fighting starts, numerous targets present themselves.

Prioritize & Select

Owing to the presence of multiple targets offering varying degrees of threat it is necessary to select the target to be taken under fire. This typically happens as a consequence of prioritizing targets based on the degree of threat they present – to your ship or perhaps to some other ship or assets you are trying to protect. You can't take all targets under fire simultaneously; you must choose.

Acquire & Track

Once a target is selected or "designated" the task at hand is one of acquiring and tracking the designated target. The component of the Gun Fire Control Systems (GFCS) that serves this tracking purpose is the fire control radar. Once acquired, the target's position and movement can be monitored and tracked. This information is fed to another component of the GFCS, the GFCS computer.

Solve the Fire Control (FC) Problem (Continuously)

The target is moving, the ship is moving, the deck of the ship is rolling and pitching and, in the case of a piloted aircraft, the pilot doesn't want to be greeted by a projectile and so the target is frequently taking evasive action. Figuring out where the target will be and calculating gun orders so that when the gun is fired the projectile will intercept the target is the job of the GFCS computer. Most important, it maintains a "running solution" (i.e., it solves the fire control problem on a continuous basis). Static solutions won't do. Everything involved is changing continuously and the solution must keep pace. Otherwise, there is no hope of hitting a moving target.

Got A Solution?

Once the solution stabilizes, the gunnery system is ready to do its job.

Bring the Guns to Bear

The gun mounts can be swung out, matched up with the orders being sent from the computer and the guns can be placed in automatic. Everything is ready.

Commence Firing

Assuming the target being tracked is still the priority and the solution to the fire control problem is being maintained, the guns are loaded and the command to commence fire is issued.

Assess the Effects

Basically, this is a matter of determining if the bullets hit the target or, in the case of projectiles with proximity fuzes, if they came close enough to the target to detonate and do enough damage to make the target no longer of interest. In any event, the effects of firing on the target must be determined.

Target Destroyed?

If it's been destroyed, you can cease firing, look for and take under fire other targets or, if there are no more targets, you can simply cease firing altogether. But, if the target has not been destroyed or sufficiently damaged to render its threat of less consequence than other targets, you will keep firing and that entails ensuring that you still have a solution to the fire control problem. The target might have broken track and you will have to reacquire and track it, then solve the fire control problem again (and keep solving it) so as to take the target under fire again.

The Civilian Version: Solving Business Problems

Guess what? Things aren't all that different in the civilian world. There, too, the targets of interest are often moving targets. Change permeates everything. And, as is the case with the fire control problem, the rate of change is a critical factor. As I was to learn to learn when I entered the civilian sector, the process of solving business problems has a lot in common with the process of solving the fire control problem. In the next portion of this post, we'll look at some of those commonalities.

Click here to read Part 2.

About the Author: My name is Fred Nickols. I am a writer, an independent consultant and a former executive. Visual aids of one kind or another have played a central role in my work for many years. I encourage you to comment on my posts and to contact me directly if you want to pursue a more in-depth discussion. I can be reached at fred@nickols.us.