July 2010

RSL Fiber Systems Challenge

Problem Statement

Gio: OK team, we need to start work on that Navy contract to design an ergonomic and energy efficient lighting system for submarines. As you know, the inside spaces of a submarine have no exposure to natural light and they must be equipped to sustain operations for very long periods of time. Research shows that sailors working in an environment without natural sunlight suffer greater stresses and are less alert– so they may make more mistakes on the job.

Samantha: That's not a good thing in a submarine!

Billie Jo: What are the specs for this system?

Gio: On a submarine, sailors are on a 6/12 schedule. That is, they're on watch for 6 hours, followed by 6 hours of other duties and then six hours of sleep. We're designing a lighting system for the 6 hour watch period. The MIL-SPEC for lighting is 289SH, and it specifies 14-15 footcandles for this area.

Nathan: What are the constraints on the system?

Gio: We need to distribute light without risking potentially hazardous conditions like EMI or RFI in sensitive areas and electricity in explosive environments. And we need to remember that energy efficiency is getting to be more important to the Navy as well.

Samantha: So what's our timeline on this project?

Gio: We've got 3 months to come up with a prototype.