1086-05-1312   **David J. Marchette*** (`dmarchette@gmail.com`), Naval Surface Warfare Center, 18444 Frontage Rd., Suite 327, Dahlgren, VA 22448. *An Analysis of Systems Readiness Functions.* Preliminary report.

Systems engineers have recently been investigating the definition and utility of "system readiness functions" for the analysis and engineering of complex systems. From a mathematical viewpoint, these are functions on weighted, attributed graphs. In this talk I will discuss system readiness functions as invariants on weighted, attributed graphs, and define a set of axioms that these functions should satisfy, as well as some properties that an engineer might find desirable. I will show that the current approaches to system readiness functions in the literature do not satisfy the axioms. I will close with progress towards a proof of the following conjecture: aside from the "trivial" functions minimum and maximum, there are no functions that satisfy the axioms. This essentially says that to determine the "readiness level" of a system one need only consider either the minimum or the maximum of the readiness levels of the components of the system. This would suggest that the approach to the analysis of complex systems through systems readiness functions is flawed. (Received September 21, 2012)