So What-Who Cares?
A THREE LEVEL APPROACH TO CREATING WINNING HIGH STAKES INITIATIVE

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Dr. Michael B. Silevitch is currently the Robert D. Black Professor of Engineering at Northeastern University in Boston, an elected fellow of the IEEE, the Director of the Homeland Security Center of Excellence for Awareness and Localization of Explosives Related Threats (ALERT) and the Director of the Bernard M. Gordon Center for Subsurface Sensing and Imaging Systems (Gordon-CenSSIS), a graduated National Science Foundation Engineering Research Center (ERC). His training has encompassed both physics and electrical engineering disciplines. An author/co-author of over 65 journal papers, his research interests include laboratory and space plasma dynamics, nonlinear statistical mechanics, and K-12 science and mathematics curriculum implementation. Prof. Silevitch is also the creator of the Gordon Engineering Leadership (GEL) Program at Northeastern University, a graduate curriculum offered through the College of Engineering, with the mission of creating an elite cadre of engineering leaders. He and the current GEL Director, Simon Pitts, were recently awarded the 2015 Bernard M. Gordon Prize for Engineering Education by the National Academy of Engineering (NAE).

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ABSTRACT

This talk will focus upon the use of a three level approach to developing concepts that will lead to significant external funding. Specifically, this will entail adapting the NSF Engineering Research Centers (ERCs) 3 level diagram to be more broadly suitable for the conceptualization of high stakes projects. The essence of the approach is to articulate the project mission and goals first at a big picture, the grand challenge or top level. In formulating these challenges a focus needs to be on addressing the watch-words: “So what-Who cares”? Then one must describe the barriers that prevent the accomplishment of the top level challenges. This leads to the creation of a research program geared to overcome the barriers, the fundamental science or bottom level. Finally one must describe a testing or middle level to validate that the results of the bottom level are in fact making progress towards addressing the challenges at the top level. Clearly this implies a spiral development process in terms of program implementation. However, the very description of the program in this way makes it easy for a reviewer to understand how the elements of a complex program fit coherently together. Examples will be given starting with a successful ERC, the Center for Subsurface Sensing and Imaging Systems (CenSSIS). The discussion will then extend to two other Center level examples: the Department of Homeland Security Center of Excellence entitled Awareness and Localization of Explosives Related Threats (ALERT) and the National Institutes of Health and Environmental Sciences Center entitled Puerto Rico Testsite for Exploring Contamination Threats (PROTECT). Both of these successful Centers were proposed by teams that had no prior track record in the domains of the solicitations. It was the use of the three level approach that made the difference. The same approach can also be applied to non-Center proposals such as NSF, DOE, DARPA and DoD CAREER proposals being prepared by young faculty members. The same approach can also be used to describe any complex endeavor whether it be in engineering or another discipline such as the social sciences or K-12 education. This will be explored as part of the talk as well.

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