INCOSE Position Statement: Thomas A. (Tom) McDermott, Jr.

Director of Strategic Integration

I am honored to accept a nomination for INCOSE Director of Strategic Integration. This is a perfect opportunity for me to give back my time to INCOSE, an organization that has supported me and my profession throughout my career. I must admit that I love strategy and the strategic integration process. I believe strategy development and execution is deeply a systems process, and successfully transforming large enterprises in times of change is systems engineering at its best. I have spent years of my career exploring and executing systems thinking and systems-of-systems engineering approaches to strategy. I discovered in those years that systems modeling is the powerful process to holistically understand an organization and that systems models are essential to forming future outcomes of a strategic process. However, I have the experience to understand that strategy is a highly social process: it is the development of the strategic plan that adds value, not the plan itself. Only people that are motivated toward a common purpose can produce transformational change. I have developed and executed the systems approach to strategic integration a number of times in my career, and I am excited to have such an opportunity with INCOSE.

I believe Systems Engineering and INCOSE are at a crossroads. Complexity, rapid change, and digitalization are and will continue to profoundly affect our discipline. We have recognized this in the INCOSE Systems Engineering Vision 2025 document, but as with most enterprises our strategies and executional norms struggle to evolve to our desired future. As Gary Roedler aptly stated in his keynote at the 2018 International Symposium, we are in danger of being irrelevant if INCOSE cannot adapt its operations and programs to the future and quickly. I have been deeply involved in the INCOSE Future of Systems Engineering (FuSE) initiative for the past 18 months, and this has created an opportunity for me to think deeply on where our profession must get to. I would propose that Systems Engineering is today too focused on being the Systems Approach to Engineering Solutions, and in the future we must also be the Systems Approach to human, societal, environmental, and other solutions. We have these strategic goals in INCOSE Vision 2025, but we need to execute the programs and operations to get there. The members of the Board of Directors over the next 3-4 years will determine our success. I would like to be a part of that.

Strategy leads to outcomes that are defined by the purpose and values of the organization. Strategic integration has the goal of aligning strategy with purpose, values, and outcomes. INCOSE has a number of strategy initiatives underway, and this Director role must be centered on the outcomes of these initiatives. One area where the role must be strongly linked is the INCOSE Value Proposition Initiative (VPI). The Vision 2025, FuSE, and VPI must come together to make sure we produce an INCOSE 2025 that truly creates value for our existing members and stakeholders, brings in new members (and stakeholders), and positions INCOSE to meet he imperatives of the Vision 2025 document. In particular, three imperatives stand out: expand the application of SE across industry domains, embrace and learn from a diversity of SE approaches, and apply SE to help shape policy for social and natural systems.

The future application domains of systems engineering will expand if INCOSE meets the needs for skills and methods that reflect the challenges of a broader set of industries. Systems engineering has often been cost centered in government and aerospace/defense domains, but in other application domains it must compete for investment and show returns. Our value proposition needs to evolve. Key value areas will be in the digitalization of engineering and in the creation of systems thinking skills. Future organizational work skills will value leadership, systems thinking and conceptual modeling, multi-disciplinarity, data analysis and computational thinking, a design mindset, agile change practices, and virtual collaboration at global scales. These are not new to systems engineering, but our branding in the community has often been associated with large scale, long-term physical system development. Strategic integration must focus on branding and value to the community.

Implementation of digital engineering methods, processes and tools will be the change agent for many organizations who desire to adopt a systems approach. Our SE Transformation initiative is at the heart of this shift. INCOSE must continue to help enterprises better understand how digital engineering will provide value to them and help create the much-needed skills and competencies. INCOSE can be the source of knowledge, relationships, training, and lessons learned in this transformation. I have been working for the past several years at the forefront of digital transformation and believe this experience will be essential to integration of future strategies.

INCOSE has the right set of initiatives working to define its strategy for change. They must be fully integrated, and this is at the sweet spot of my experience. I am fortunate to have developed a broad set of leadership and technical skills working with many application domains including defense, commercial, research, and academia. This provides me with seat to view the transformation opportunities across numerous industries that could be led by INCOSE and our people. As a consultant I have worked with industries across defense and aerospace, construction, transportation, information and telecommunications, social innovation, and even the fine arts. I bring to the role a systems mindset rooted in strategic innovation and enterprise change. I have worked with both governments and industries at the senior leadership level to define and implement enterprise change strategy. I know how to engage “C-level” leadership. Articulating the value of an INCOSE enterprise change model aligned with our value propositions to all INCOSE operations, working groups, chapters, and stakeholders will be at the center of my focus. I believe I can help INCOSE embrace new application domains and enterprises, and grow its impact globally. Our Vision 2025 describes a strategic evolution of our organization, and I believe my skills can help get us there.

Biography: Thomas A. (Tom) McDermott, Jr.

I am a Systems Engineering consultant, practitioner, and research leader involved in a number of forward-leaning systems engineering initiatives. I currently serve as the Deputy Director of the Systems Engineering Research Center (SERC) at Stevens Institute of Technology in Hoboken, NJ. The SERC is a University Affiliated Research Center sponsored by the Office of the Secretary of Defense for Research and Engineering. With the SERC, I focus on new research

strategies, program development, and research on Digital Engineering transformation, education, security, and artificial intelligence applications. I also lecture in Georgia Tech's Professional Education college on system architecture concepts, systems thinking and decision making, and engineering leadership. I lead a masters level course on systems engineering leadership and teach a number of continuing education short courses. I consult with organizations on enterprise modeling for transformational change, and often serve as a systems engineering expert on government major program reviews. The range of activities keeps me at the forefront of the profession.

I have 35 years of background and experience in technical and management disciplines, including 15 years at the Georgia Institute of Technology and 18 years with Lockheed Martin. I served as Director of Research and Deputy Director of the Georgia Tech Research Institute (GTRI) from September 2007 until August 2013, including Interim Vice President and GTRI Director from May 2010-January 2011. My responsibilities included executive management of GTRI's eight research labs, responsibility for all research faculty, students, research proposals, and research budgets; management of Georgia Tech's Research Security programs; management of GTRI's sponsor development activities; development of GTRI strategy planning; management of investments including internal research, capital, and intellectual property; and oversight of Georgia Tech Ireland, GTRI's international research venture. While at GTRI, I helped to execute a growth strategy which resulted in increased annual research awards from $132M to over $300M, increased research faculty from 528 to 868 engineers and scientists, and establishment of a capital reserve fund. I led strategic programs that created a Cyber Technology and Information Security Laboratory and a research program in Autonomous Systems. These became GTRI's largest growing impact areas. I also developed strategy to operationalize personnel development programs resulting in recognition as one of Atlanta's top 10 places to work for four years and an international award for GTRI from the IEEE as its top professional development program.

Prior to GTRI, I spent 18 years with Lockheed Martin Aeronautics Company (1984-2002). I held a director level position with Lockheed Martin from April 1999 – May 2002, serving as Chief Engineer and Division Manager for Lockheed Martin's F-22 Raptor Avionics Team. In this role I had overall team leadership for Lockheed Martin, Boeing, & Air Force product team, over $3B total budget oversite, $1B direct budget authority, division level supervision for over 200 systems, software, and simulation engineers, subcontract management for 7 major critical suppliers totaling over $1B in contracts, and management of F-22 software development and simulation laboratories, and executive level reporting to Lockheed Martin and Department of Defense leadership. My F-22 Avionics team successfully executed Raptor #4004 avionics first flight in January 2001.

I have technical background in a wide spectrum of disciplines relevant to Systems Engineering. These include Complex Systems: sociotechnical analysis and modeling, decision making in uncertain environments, and managing systemic opportunities & threats; Systems Engineering: development of methods and tools that provide collaborative environments for multi-attribute decision making, portfolio planning, and robust design; Software: development of secure computer operating systems, information network management, real-time embedded

applications, and human-computer interfaces; Security: systems engineering and architectures for trusted computing networks and secure information systems; and Computer Architecture: lead systems engineer for the F-22 mission computer, including innovative heat management designs, memory architectures, access control, materials.

I have been a strategic integrator for several non-profit volunteer organizations. From 2014-2017 I was a cofounder and inaugural Executive Committee Treasurer of the National Spectrum Consortium, a defense focused innovation consortium targeting spectrum relocation activities. From 2014-2018 I was a founding member of the Executive Board of the Systems Engineering and DEVOPS Committee for the Technology Association of Georgia, a local industry association supporting Georgia businesses with their agile transformations. I have international consortium experience, serving on the advisory board of Project CAMINO (Comprehensive Approach to cyber roadMap coordINation and development) from 2015-2016. I also have experience as a technical and strategy advisor to several small businesses. In addition, I have in the past served in voluntary leadership as president of my neighborhood homeowners' association and several local booster clubs.