CIS External Technical Review Background Information Supplement
Dr. Leonard Napolitano, Director
Computer Sciences & Information Technologies Center 8900
Sandia National Laboratories

CS&IT Vision:
Our vision is to be the world's best information science and technology center delivering the power of information technology to solve problems of national importance.

CS&IT Mission:
Our mission is to deliver the power of information to support Sandia's business objectives. In performing this mission we will enable the success of the CA Site vision and goals. We aim to transform the CA site into an organization that depends upon the use of High Performance Computing (HPC) and Information Technology (IT) for competitive advantage and mission success. A unique aspect of the CS&IT center is that we have a mission pull from the other California centers to provide high performance computing solutions locally to enable and support their success. We perform this mission in close partnership with the CCIM center to provide a strong tech base overall to the laboratory. We strive to focus and differentiate our R&D in areas that complement, not compete, with the strengths of the larger CCIM center.

In order to take advantage of changing business opportunities, particularly in the areas of Homeland Security and Information Operations, the CS&IT center has recently completed an evaluation of its program development portfolio. As a result of this effort seven areas viewed as having the greatest opportunity for expansion and growth were identified. These seven areas are listed below. These areas will constitute the focus of the program development activities in the organization for the upcoming year.

- Decision Support
- Distributed Intelligent Systems and Applications
- Knowledge Environments
- Informatics
- Network Traffic & System Assessments
- Scientific Computing
- High Performance Computing

The foundation for these activities is derived from the center's core research efforts. In particular, the CSRF-sponsored research in algorithms, high-performance computing, and distributed systems will enable the next generation of modeling and simulation tools to support Sandia's Nuclear Weapons and national security programs. Project efforts as categorized into the three discipline areas are as follows:

Algorithms:
- Optimization & uncertainty quantification
- Linear & non-linear systems
- Automated algorithm selection
- Data mining, data fusion, and pattern recognition

HPC systems:
- Infiniband communication
- Parallel file systems
- Scalable storage
- FPGAs

Distributed systems & applications:
- Event prediction and characterization based on machine learning and inference
- Secure architectures
- Collaboration tools
- Agent-based, discrete-event, and numerical simulations
- Expert systems

In addition to these research areas, the CS&IT center has a significant information technology portfolio funded by lab indirect that is heavily leveraged as we transition R&D solutions to production.

<u>Customers for this review</u>:
The Vice President of Division 8000 and the CS&IT (center 8900) management team are customers in addition to those identified in the CCIM overview.