3.1 RESEARCH AND DEVELOPMENT SUPPORT

The contractor shall provide research, investigation, analytical, and general technical support for emerging technologies. Science and Technology Research Areas and Engineering Support Areas include the following:

3.1.1 Mathematics which includes areas such as computer mathematics, modeling and simulation, statistics and probability, principal components, Bayesian methods and cost engineering

3.1.2 Physics such as advances and applications of nanotechnology and Nano devices

3.1.3 Computer Science & engineering such as knowledge transfer, human interfaces, artificial intelligence, intelligent agents, neural networks, genetic algorithm application, evolutionary computing (SWARM, ant colony), grid computing, and quantum computing.

3.1.4 Software engineering such as enterprise engineering, data modeling, modeling and simulation, executable architectures, process automation, wired and wireless computer networks, measurement and instrumentation

3.1.5 Computer hardware engineering in areas such as parallel processing (cell processor, video engines, multi-core GP processors, clusters, blades, multi-DSP/FPGA configuration), bricking, stackable systems (Lego type buildable systems) and electronic circuits

3.1.6 Communications in areas such as services over low bandwidth, multi radio adaptive antenna arrays, antennas and fields, radio switching algorithms for single devices with multiple radios, adaptive beam focusing antennas, and built in antennas

3.1.7 Software Radio support in areas such as FPGA programming, DSP programming, wideband power amplifiers, high speed D/A – A/D devices, digital communications, adaptive filtering, adaptable waveforms, direction finding methods, signal identification, computationally efficient transforms, adaptive beam forming, mobile *ad hoc* networks, routing

3.1.8 Human systems research such as cognitive modeling, behavioral modeling, psychophysical modeling, eye tracking, immersive systems, multi-sensory devices and systems, knowledge transfer, human interfaces and biometrics

3.1.9 Architecture approaches over highly volatile communications such as semantic data, orchestration/choreography, and SOA particularly focused on web services, data discovery, security, SW agents, component based architectures, large enterprise federation and security and policy in large enterprises

3.1.10 Embedded systems design particularly in areas of power efficiency and mission-designed system-on-chip (SoC) and executable architectures

3.1.11 Packaging Methods such as effects of shock and vibration and advanced concepts in cooling

3.1.12 Industrial Engineering in areas such as improving manufacturing (MRAP and other large integration projects), supply chain management and quality control

3.1.13 English and Literature such as language translation (audio to audio, audio to text, speech synthesis, text to text, text to audio) and technical proposal writing

3.1.14 Safety in areas such as lightning protection effects of radio frequency radiation

3.1.15 Designing, exercising and/or testing models utilizing stimulation, simulation, emulation, numerical and statistical analysis techniques.

3.1.16 Conducting software engineering experiments, studies, measurements, analysis, test and evaluation.

3.1.17 Collecting test data and criteria to analyze, score, and evaluate.

3.1.18 Designing, developing, testing or reviewing and analyzing large scale database structures, data correlation and conversion techniques. Designing and coding database tools.

3.1.19 Developing web applications and tools. Creating or upgrading websites and/or web pages and graphics.

3.1.20 Installing and integrating software applications and hardware components. Resolving workstation hardware and software challenges.

3.1.21 Designing, fabricating, testing, and documenting circuit cards/boards and/or other specifically delineated developmental hardware.

3.1.22 Collecting, developing, analyzing and scoring performance data; developing interview and questionnaire forms; developing instructional media material for pilot studies; and/or administering tests to military or civilian personnel.