KE11-LA-UR- Pu Surveillance R&D Support. The objective of the pit materials R&D effort is to determine the effects of corrosion and aging on important properties (e.g., reactivity, geometry, density, purity) of plutonium weapons components.

KE12-LA-UR- Dynamic Behavior of Pu & U (Intermediate Strain Rate). Assessment and qualification of Pu and U requires an understanding of and predictive modeling capability to assure performance, safety, and surety of these systems in the field. These properties are critical for not only new components but also for aging components in the stockpile. Dynamic characterization and advanced constitutive modeling support of the qualification and hydrotesting efforts are crucial to the Laboratory's above-ground testing and evaluation thrust, of new and aged materials.

KE13-LA-UR- X-ray absorption fine structure (XAFS) Spectroscopy/X-ray diffraction (XRD) to Measure Microscopic Material Stability. The objective of this project is to determine the atomic-level structure of plutonium alloys of interest to the stockpile, to provide information on the mechanism of delta-phase stabilization and the effects of aging.

KE14-LA-UR- Material Property/Surveillance Database (All Materials). This project will identify, compile, review, update, and expand the existing engineering material property data base(s) used to design and analyze the existing enduring stockpile.

KE15-LA-UR-4062 Uranium Corrosion & Aging. This project will characterize the aging effects of hydrogen-based environments on uranium, a combined surface and bulk study, tied together with dynamic mechanical property testing.

KE16-LA-UR- TV Laser Holography/Laser Speckle Interferometry. The objective of this work is to study the feasibility of using TV holography testing to detect flaws and weak points in stockpile piece parts and subassemblies when thermal, mechanical or dynamic changes are applied.

KE18-LA-UR- Bayesian Inference Tomography. Enhancement of the graphical interface of our Bayes Inference Engine.

KE19-LA-UR- NDE Program R&D Support. This is a multi-program effort to identify and demonstrate agile, flexible, and environmentally acceptable technologies needed to survey the aging stockpile and provide the designers data to calculate trends.

KE20-LA-UR- Low Level Vibration & Adv. Signal analysis Techniques. Development of a toolbox of analysis techniques which will be applied to low level vibration test data at component and sub-system levels. Emphasis on developing models of non-linear behavior and correlating test response to presence of defects.

KE21-LA-UR- Development of SQUID Microscope for Surveillance.

KE23-LA-UR- Enhanced Reliability Methodology Pilot Program

KE24-LA-UR- Theory and Simulation of Polymer Aging. A new method giving the aging of the nuclear weapon stockpile and the halting of nuclear testing necessary to estimate the reliability of the weapon system nuclear package.

KE25-LA-UR- Predictive Models for PBX 9501 HE. The study of the stability and aging of polymers (high explosives, binders, and fillers) using classical, quantum and statistical mechanical theoretical techniques.