

The National Automated Testbed Program (NAMT) has begun a project at the National Institute of Standards and Technology (NIST) for research into the application of intelligent systems for the design, manufacture and calibration of interstitial and intravascular brachytherapy sources. The program consists of three major thrusts: 1) use of theoretical modeling codes to predict source output from design input, 2) construction of source standard reference materials for use during source manufacturing, and 3) construction of an automated calibration facility with remote presence capabilities. The overall goal of the project is to assure that the final manufactured source matches the design as nearly as possible. Achieving these goals rests on knowledge necessary to fully specify any radioactive source: accurate knowledge of the source construction, accurate knowledge of the source activity and its distribution within the source, and accurate dosimetry measurements. The project is a collaboration between the Radiation Interactions and Dosimetry Group and the Radioactivity Group of the NIST Ionizing Radiation Division, and the NIST Intelligent Systems Division. The talk will elaborate the project goals, and the progress which has been made to date. Special emphasis will be placed on the NIST automated calibration facility, which contains several well-ionization chambers, an extrapolation ionization chamber, a micro-scintillator scanning system, and a high-resolution densitometer with automated radiochromic film handling system. Sources being calibrated are delivered to these measuring devices with an automated source handling system which will also be described.