

Development of a New Course of Nuclear Power with Emphasis on Safety-Critical Application in Digital Instrumentation and Control

A. Executive Summary

Project Title: Howard University Development of a New Course of Nuclear Power with Emphasis on Safety-Critical Application in Digital Instrumentation and Control

Principal Investigators:

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Total Funding Request: \$200,000 (Project Period: 10/01/2010 – 9/30/2012 (2 years))

Project Objectives and Benefits: This proposal addresses the lack of minority students and engineers in the challenging area of safety-critical application in digital control technology for nuclear power plant. The proposal aims to develop a new course of nuclear power and to teach it to all engineering students at Howard University, which do not have a nuclear engineering department, the concepts of hardware/software diversity against common mode failures and the realistic practice of those concepts in the reactor scram control of nuclear power plant operation. A unique teaching model is applied in offering the course developed by the first year of the project period. The model seeks to teach the new course by combining guest experts who will teach general nuclear engineering concepts and theories and the proposal investigators who will teach the specific area of software/hardware reliability in digital instrumentation and control. The unique location of Howard University which has been successful in inviting external experts to the classrooms makes this new model of teaching possible. Therefore, the proposal's main tasks are to form a nuclear power expert network from which guest speakers are selected and to develop a learning module for safety-critical application in instrumentation and control.