

SECTION A. Project Title: Validation of RELAP-7 for forced convection and natural circulation reactor flows – University of Illinois at Urbana-Champaign**SECTION B. Project Description**

The University of Illinois at Urbana-Champaign proposes to aid in the development of RELAP-7 through required experimental and computational efforts. The validation of the two-phase modeling capability of RELAP-7 will be accomplished through a series of tasks which include synthesis of existing forced convective data, acquisition of natural circulation reactor flow data from an existing well-scaled facility, and uncertainty quantification in constitutive modeling.

SECTION C. Environmental Aspects / Potential Sources of Impact

Water/Well Use – The experimental facility requires approximately 300 gallons of city water, which acts as the working fluid in the experiments. To ensure water quality, the facility is expected to be replenished three or four times to complete the scope of experiments proposed.

Discharge of Wastewater – After experiments are completed the water from the experimental facility is drained as wastewater through available drainage in the laboratory. The water expelled from the facility is considered by the university to be within the acceptable capacity for general laboratory use.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B; give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not “connected” nor “related” (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial development.

Justification: The activity consists of university-scale research and modeling of forced convective and natural circulation reactor flows.

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 06/29/2016