

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Enhancing Yellowjacket for Modeling the Impact of Radiation and Stress on the Corrosion of Molten-Salt-Facing Structural Components – University of Florida**

**SECTION B. Project Description**

The University of Florida (UF) proposes to add the capability to the Yellowjacket code to model the impact of radiation and stress on the corrosion of molten-salt-facing structural components. UF will also use Yellowjacket to create surrogate models that will be added to the Mole and Grizzly engineering-scale codes. New experimental data will be collected for validation of the new Yellowjacket capability that quantifies the impact of stress and radiation on corrosion of 316H stainless steel (SS) in molten FLiNaK (LiF-NaF-KF (46.5-11.5-42 mol %)). The work will include code development, verification, and validation, closely coordinated with new experimental work to obtain validation data. This work will be broken down into the following three tasks: 1) Yellowjacket Development - In this project, we will enhance Yellowjacket by adding three new capabilities: the impact of stress and creep, the impact of radiation, and calculation of the effective elastic constants and yield stress of a corroded microstructure.; 2) Surrogate Model Development; and 3) Validation Data Collection.

**SECTION C. Environmental Aspects / Potential Sources of Impact**

The university (and its partner universities) have procedures in place to handle any waste that will be generated through this project. The action would not create additional environmental impacts above those already occurring at the universities.

**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). For purposes of this category, “demonstration actions” means actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment. Demonstration actions frequently follow research and development and pilot projects that are directed at establishing proof of concept.

Justification: The activity consists of an investigation to fundamentally advance the capabilities of Yellowjacket and its ability to interface with the Mole and Grizzly codes.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act)  Yes  No

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer, on 09/17/2021.