

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Development of a Rapid Chemical Assessment Capability for In-Situ TEM Ion Irradiations – University of Michigan

SECTION B. Project Description

The University of Michigan proposes to acquire and deploy a Gatan GIF (Gatan Imaging Filter) Continuum ER system to its ThermoFisher Tecnai TF30 scanning/transmission electron microscope (S/TEM) that is coupled to dual ion beam lines in the Michigan Ion Beam Laboratory (MIBL). The inclusion of the Gatan GIF will provide the ability to complete rapid analytical electron microscopy using either electron energy loss spectroscopy (EELS) and/or energy filtered TEM (EFTEM) on irradiated or non-irradiated specimens. Addition of the Gatan GIF will also enable the capability for rapid chemical assessment capabilities during in-situ TEM ion irradiations within MIBL and the Nuclear Scientific User Facilities (NSUF) program. The equipment to be acquired is a Gatan GIF Continuum ER system and the associated equipment/software including the STEMPack Spectrum Imaging System, STEMPACK Support for GIF Quantum System, GIF Continuum ER Suite, GEN3 Camera Housing and Flange, GMS 3 Analytical PC System, and the GIF Continuum ER installation services. The University of Michigan, through MIBL, has been a partner facility of NSUF since 2009 and is a routinely used partner facility. In addition, there is a large group of graduate students, post-doctoral fellows, research scientists, international exchange scholars and students working on radiation effects in various alloy systems using the MIBL facility.

SECTION C. Environmental Aspects / Potential Sources of Impact

The university has 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 university.

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: B1.31 Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.

Justification: The activity consists of the acquisition and deployment of equipment to provide a new research avenue for conducting in-situ observations of radiation effects during single and dual-ion beam irradiations.

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 07/23/2021.