U.S. DEPARTMENT OF ENERGY
FINDING OF NO SIGNIFICANT IMPACT FOR THE ENVIRONMENTAL ASSESSMENT FOR THE RESUMPTION OF TRANSIENT TESTING OF NUCLEAR FUELS AND MATERIALS

Agency: U.S. Department of Energy (DOE)

Action: Finding of No Significant Impact (FONSI)

Summary: The DOE has determined there is a mission need to develop and test nuclear fuels in order to improve nuclear reactor sustainability and performance, to reduce the potential for proliferation of nuclear materials, and to advance the nuclear fuel cycle. To meet these needs, DOE proposes to re-establish U.S. transient testing research and development capability. DOE believes resuming this capability will aid in the development of new, advanced, safer, and more efficient fuels that will generate additional quantities of clean, reliable, economical electricity using nuclear power reactors. The transient testing capability will be needed for at least 40-years. The U.S. has not conducted significant transient testing on nuclear fuels in over a decade. Transient testing involves placing nuclear fuel or material samples into the core of a nuclear test reactor and subjecting it to short bursts of intense, high-power radiation. DOE prepared an environmental assessment (EA) to evaluate the potential environmental impacts of the proposed action to resume transient testing.

DOE developed a set of selection criteria, based on research and development experimental objectives, to help identify a reasonable set of alternatives to resume full-scale transient testing. DOE reviewed and analyzed two reasonable alternatives, plus a third "No Action" alternative. Several additional alternatives were considered but not analyzed because they did not meet the purpose and need criteria.

Alternative 1: DOE's preferred alternative – Restart the Transient Reactor Test Facility (TREAT) Reactor at the Idaho National Laboratory (INL).

Alternative 2: Modify the Annular Core Research Reactor (ACRR) at Sandia National Laboratories in New Mexico (SNL/NM).

Alternative 3: DOE considered a "No Action" alternative that establishes a baseline against which the environmental assessment compared the other analyzed alternatives. No action does not necessarily mean doing nothing, but rather involves maintaining or continuing the existing status or condition. As analyzed in the EA, no action means: (1) not restarting the TREAT Reactor and (2) not modifying the ACRR to expand its' capability for transient testing. Under this alternative, certain aspects of transient testing would still be pursued at facilities that have very limited operational capabilities. Specifically, transient testing at these facilities would be limited to conducting static tests of un-irradiated fuel. This alternative does not meet the mission need.

Analysis: Based on the analyses in the EA, the preferred alternative will not significantly affect the human environment within the meaning of the National Environmental Policy Act (NEPA).

The term "significantly" and the significance criteria are defined by Council on Environmental Quality Regulations for implementing NEPA at 40 CFR 1508.27. The significance criteria relevant to Alternative 1 are addressed and the applicable corresponding analyses in the EA are referenced below.

1.) Beneficial and adverse impacts (40 CFR 1508.27 (b) (1)]: Transient tests are of extremely short duration. Radioactive air emissions are gases and their decay products that result from the activation of naturally occurring elements in cooling air and impurities in fuel cladding material. The concentrations of radioactive emissions from normal operations and accidents were calculated by modeling, and the impacts are predicted to be negligible. Potential impacts to soil, groundwater, biological and cultural resources, sustainability, waste generation, transportation, and non-radiologic air emissions were fully analyzed. The analyses demonstrated that there will be no adverse impacts from implementing the preferred alternative. (section 4)

2.) Public health and safety [40 CFR 1508.27 (b) (2)]: Potential impacts to public and worker health and safety from normal operations and accident scenarios were analyzed. The results convey that the potential radiation doses and latent cancer fatalities are well below established standards. DOE will implement engineered and administrative controls to further ensure safety and to minimize the potential for environmental consequences from TREAT operations. The TREAT Reactor is based on an inherently safe design that minimizes the potential for and impacts of reactor accidents. Design features will be augmented by operational requirements and administrative controls during reactor operations to ensure operating parameters are not exceeded during testing operations. (section 4)

3.) Unique characteristics of the geographical area [40 CFR 1508.27 (b) (3)]: The Eastern Snake River Plain Aquifer underlies the TREAT facility location at the INL. The potential for impacts to the aquifer from the proposed action during normal operations is not-credible. In the unlikely event of an accident with releases, any contaminated soil areas will be secured, remediated and mitigated. The INL is comprised of areas of pristine and protected sagebrush steppe ecosystem that provides significant habitat for large numbers of native vegetation and wildlife species, and the INL encompasses significant historic and cultural resources. Implementing the preferred alternative will not result in any direct impacts to these areas, species or resources. (section 3/section 4)

4.) Degree to which effects on the quality of the human environment are likely to become highly controversial [40 CFR 1508.27 (b) (4)]: DOE used state-of-the-art scientific methods, technology, and qualified experts to assure the accuracy and quality of the impacts analyses and to provide confidence in the results of this assessment. There are no substantive technical or scientific issues related to the preferred alternative that are not understood, quantified and validated. Since the impacts to the quality of the human environment were determined to be negligible, DOE has made a Finding of No Significant Impact. Comments received from the

public challenging DOE's analysis have been substantively resolved. All comments and responses are documented in Appendix A of the Environmental Assessment.

5.) Uncertain or unknown risks on the human environment [40 CFR 1508.27 (b) (5)]: The risks associated with the preferred alternative are well-defined. The TREAT facility has an extensive history of safe operations, demonstrating limited uncertainty in relation to implementing the preferred alternative. Nonetheless, all resource areas were screened and carefully analyzed before critical areas were identified for detailed analysis in the EA. All analyses used accepted methodologies and input values and were based on conservative assumptions to ensure the results adequately bounded the potential impacts to human health and the environment.

6.) Precedent for future actions [40 CFR 1508.27 (b) (6)]: The preferred alternative does not set a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration on the INL. The proposed action was developed to meet existing mission needs. No connected or future actions or operations are being considered that rely on decisions made in this EA or the implementation of the preferred alternative. All proposed new actions undergo appropriate NEPA analysis.

7.) Cumulatively significant impacts [40 CFR 1508.27 (b) (7)]: The calculated impacts to the critical resource areas from implementing the preferred alternative were individually insignificant. The additive impacts from implementing the preferred alternative to those manifested from past, ongoing or reasonably foreseeable future projects or programs on and adjacent to the INL were evaluated and also determined to be insignificant. (section 4.1.6)

8.) Effect on cultural or historic resources [40 CFR 1508.27 (b) (8)]: The area of potential ground disturbance is very small for the preferred alternative. Field surveys demonstrated that no archaeological resources are located in the area of potential effect, so implementation poses no direct threat to any cultural resource. The TREAT Reactor Building and original Reactor Control Building are potentially eligible for listing on the National Register of Historic Places. The proposed adaptation, re-use and continued use of these historic properties are consistent with original missions related to nuclear reactor testing and are considered to be positive. (section 4.1)

9.) Effect on threatened or endangered species or critical habitat [40 CFR 1508.27 (b) (9)]: No threatened or endangered species exist on the INL. Therefore no critical habitat is impacted by the implementation of the preferred alternative. The sage-grouse is considered to be a candidate for listing by the U.S. Fish and Wildlife Service. Impacts to sage-grouse are not anticipated because of the limited amount of disturbance planned, the lack of suitable habitat in the potentially impacted area, and the long distance from TREAT to the nearest active lek (breeding area). (section 4.1)

10.) Violation of Federal, State or local law [40 CFR 1508.27 (b) (10)]: DOE is confident that implementation of the preferred alternative does not pose any potential for a violation of any law. The DOE regulatory compliance history at the INL site demonstrates a progressive and comprehensive compliance posture and the results of regulatory oversight activities affirms the existence of a strong environmental, safety and health culture. (section 5)

Determination: Based upon the analysis presented in the attached EA, I have determined that the preferred alternative would not significantly affect the quality of the human environment. Therefore preparation of an environmental impact statement is not required.

Issued at Idaho Falls, Idaho on this 26th day of February, 2014

Richard B. Provencher
Manager

Copies of the EA and FONSI are available from: Tim Jackson, Office of Communications, MS-1203, Idaho Operations Office, U.S. Department of Energy, 1955 Fremont Avenue, Idaho Falls, ID 83415, or by calling 208 526-8484.

For further information on the NEPA process contact: Jack Depperschmidt, NEPA Compliance Officer, MS-1216, U.S. Department of Energy, 1955 Fremont Avenue, Idaho Falls, ID 83415, or by calling 208 526-5053. For further information on the Resumption of Transient Testing , contact Julie Conner, Federal Project Director, MS-1170, Idaho Operations Office, U.S. Department of Energy, 1955 Fremont Avenue, Idaho Falls, ID 83415, or by calling 208 526-9503.