



U.S. Department of Energy Categorical Exclusion Determination Form

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Proposed Action Title: Westinghouse Electric Company LLC -- Self-Regulating, Solid Core Block "SCB" for an Inherently Safe Heat Pipe Reactor

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Cranberry Township, Pennsylvania

Proposed Action Description:

FIFTH AMENDED DETERMINATION: (See attached for original and subsequent amended determinations) This Amended Determination follows the approval of additional funds, period of performance, and new project milestones to support the project team's continued small-scale, research and development activities of a self-regulating "solid core block" (SCB) and to construct digital twin design models of the SCB microreactor system under the Modeling-Enhanced Innovations Trailblazing Nuclear Energy Reinvigoration (MEITNER) program. Specifically, the project team will (1) design, construct, and verify the digital twin microreactor system, (2) test and validate operation and functionality of the digital twin microreactor system, and (3) refine and finalize microreactor design using the digital twin and test data. If successful, this project will support advanced reactor designs that achieve lower construction cost, enable autonomous operations while also improving safety, and increase the competitiveness of nuclear power, thereby reducing greenhouse gas emissions from fossil fuel combustion.

Project activities will be conducted at an existing facility at Westinghouse (Cranberry Township, PA). Project tasks continue to fit within the class of actions identified under the DOE Categorical Exclusions identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the project. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the project. Project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE
Date: 2023.12.07 11:57:04 -05'00'

Date Determined:



U.S. Department of Energy Categorical Exclusion Determination Form

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Proposed Action Title: Self-Regulating, Solid Core Block "SCB" for an Inherently Safe Heat Pipe Reactor

Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): Cranberry Township, Pennsylvania; Madison, Pennsylvania; Los Alamos, New Mexico

Proposed Action Description:

FOURTH AMENDED DETERMINATION (See attached original determination dated June 26, 2018, first amended determination dated July 23, 2018, second amended determination dated August 17, 2018, and third amended determination dated February 27, 2019.) This Amended Determination follows the approval of additional funds to support the project team's small-scale, research and development activities to include the automated production of an alkali metal heat pump system as part of an in-progress microreactor design. Specifically, the project team will (1) design, construct, and test the automated system, (2) construct and test the alkali heat pipe, and (3) combine components for use in the microreactor system. If successful, this project will support advanced reactor designs that achieve lower construction cost, enable autonomous operations while also improving safety, and increase the competitiveness of nuclear power.

Project activities will be conducted at existing facilities at Westinghouse (Cranberry Township, PA and Madison, PA) and Los Alamos National Laboratory (Los Alamos, NM). Project tasks continue to fit within the class of actions identified under the DOE Categorical Exclusion identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the project. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the project. Project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and local regulatory requirements.

Categorical Exclusion(s) Applied:

- A9 - Information gathering, analysis, and dissemination
- B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

- The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.
To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.
- There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.
- The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE
Date: 2022.07.05 11:19:14 -04'00'

Date Determined:



U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Modeling-enhanced Innovations Trailblazing Nuclear Energy Reinvigoration (MEITNER) (FOA No. DE-FOA-0001798) Program


Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): ID; IL; IN; MA; MD; NC; NM; NY; OH; PA; TN; VA; VT; WA

Proposed Action Description:

THIRD AMENDED DETERMINATION

The MEITNER Program (hereinafter "Program") seeks to fund the development of innovative technologies that enable designs for lower cost, safer, advanced nuclear reactors. If successful, MEITNER projects will support advanced reactor designs that achieve lower construction cost, enable autonomous operations while also improving safety, and increase the competitiveness of nuclear power.

The Program is composed of 11 small-scale research and development projects that will be conducted by universities, non-profit entities, for-profit entities, and federal laboratories. This Third Amended Determination adds two projects (Moltex Energy USA, LLC and SUNY-Stony Brook) and reflects a change in Prime Recipient from Terrestrial Energy to Oak Ridge National Laboratory for Control Number 1798-1546, to the June 26, 2018 Determination, as amended on July 23, 2018 and August 17, 2018 (see Attachment for all projects covered by this and the prior Determinations). These projects are covered by and fit within the class of actions identified under the DOE Categorical Exclusions identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the projects. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the projects. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements. No modifications will be made to the existing facilities to accommodate the proposed work 

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.15 - Small-scale indoor research and development projects using nanoscale materials

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of 10 CFR Part 1021.

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined: 02/27/2019



U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Modeling-enhanced Innovations Trailblazing Nuclear Energy Reinvigoration (MEITNER) (FOA No. DE-FOA-0001798) Program

Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): ID; IL; MA; MD; NC; NM; NY; OH; PA; TN; VA; VT; WA

Proposed Action Description:

SECOND AMENDED DETERMINATION

The MEITNER Program (hereinafter "Program") seeks to fund the development of innovative technologies that enable designs for lower cost, safer, advanced nuclear reactors. If successful, MEITNER projects will support advanced reactor designs that achieve lower construction cost, enable autonomous operations while also improving safety, and increase the competitiveness of nuclear power.

The Program is composed of 10 small-scale research and development projects that will be conducted by universities, non-profit entities, for-profit entities, and federal laboratories. This Second Amended Determination adds 2 projects (North Carolina State University and SUNY University of Buffalo) to the Determination and First Amended Determination, signed on June 26, 2018 and July 23, 2018 respectively (see Attachment for all 7 projects covered by this and the prior Determinations). These projects are covered by and fit within the class of actions identified under the DOE Categorical Exclusions identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the projects. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the projects. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements. No modifications will be made to the existing facilities to accommodate the proposed work

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

(This form will be locked for editing upon signature)

Date Determined:

8/17/18



U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Modeling-enhanced Innovations Trailblazing Nuclear Energy Reinvigoration (MEITNER) (FOA No. DE-FOA-0001798) Program

Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): Urbana, Illinois

Proposed Action Description:

The MEITNER Program (hereinafter "Program") seeks to fund the development of innovative technologies that enable designs for lower cost, safer, advanced nuclear reactors. If successful, MEITNER projects will support advanced reactor designs that achieve lower construction cost, enable autonomous operations while also improving safety, and increase the competitiveness of nuclear power.

The Program is composed of 9 small-scale research and development projects that will be conducted by universities, non-profit entities, for-profit entities, and federal laboratories. This Determination covers 1 of the 9 projects (University of Illinois at Urbana-Champaign) and will be amended to address the remaining projects seriatim or simul (see Attachment for more information on the selected projects). This project is covered by and fits within the class of actions identified under the DOE Categorical Exclusions identified below and does not involve any extraordinary circumstances that may affect the significance of the environmental effects of the project. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements. No modifications will be made to the existing facilities to accommodate the proposed work.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined: 06/26/2018

Attachment: Projects in the MEITNER (FOA No. DE-FOA-0001798) Program

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
General Atomics (1798-1602)	Reducing Nuclear Plant Capital Costs Using Pre-Cast Fiber-Reinforced Concrete	TBD (pending final review)
HolosGen, LLC (1798-1595)	Transportable Modular Reactor by Balance of Plant Elimination	A9, B3.6
University of Illinois at Urbana-Champaign (1798-1576)	Enabling Load Following Capability in the Transatomic Power MSR	A9, B3.6
General Atomics (1798-1557)	Improved Load Following in an Advanced Nuclear Plant Using a High-Efficiency Brayton Cycle with Variable-Speed Generator	TBD (pending final review)
Oak Ridge National Laboratory (1798-1546)	Magnetically Suspended Canned Rotor Pumps for the Integral Molten Salt Reactor	A9, B3.6
Yellowstone Energy (1798-1526)	Reactivity Control Device for Advanced Reactors	A9, B3.6
Westinghouse Electric Co., LLC (1798-1520)	Self-Regulating, Solid Core Block "SCB" for an Inherently Safe Heat Pipe Reactor	A9, B3.6
SUNY University at Buffalo (1798-1517)	Reducing Overnight Capital Cost of Advanced Reactors Using Equipment-Based Seismic Protective Technologies	A9
North Carolina State University (1798-1512)	Development of a Nearly Autonomous Management and Control System for Advanced Reactors	A9
Moltex Energy USA, LLC (1798-1548)	Rigid-Elastic Composite Civilworks	B3.6
SUNY-Stony Brook (1798-1516)	Magnetically Suspend Canned Rotor Pumps for the Integral Molten Salt Reactor	B3.6, B3.15