May 30, 2023

The Honorable Jennifer M. Granholm
Secretary of Energy
U.S. Department of Energy
1000 Independence Ave. SW
Washington DC 20585

The Honorable Jill Hruby
Under Secretary for Nuclear Security, and
Administrator of the National Nuclear Security Administration
U.S. Department of Energy
1000 Independence Ave. SW
Washington DC 20585

Re: Proposed MCRE Reactor Violates U.S. Nonproliferation Policy of HEU Minimization

Dear Secretaries Granholm and Hruby,

We, the undersigned experts on nuclear nonproliferation, urge you to reconsider the proposed Molten Chloride Reactor Experiment (MCRE) on the grounds that it would use fuel containing more than 600kg of 93%-enriched, weapons-grade, highly enriched uranium (HEU) – enough for dozens of nuclear weapons – which would undermine the longstanding U.S. policy of HEU minimization, and thereby increase risks of nuclear proliferation and nuclear terrorism.

The U.S. government established its HEU minimization policy in the 1970s, in belated recognition that fresh or even irradiated HEU fuel could be used to make nuclear weapons by states or terrorists. Since then, at least 71 reactor facilities around the world have converted their fuel from HEU to low-enriched uranium (LEU), which is impractical for use in nuclear weapons. The U.S. government also has opposed construction of any new research facility using HEU, whether foreign or domestic, on grounds that it would undermine the international norm and thereby encourage further use of HEU that would increase risks of nuclear weapons spreading to states and terrorists. Your department did consider constructing one new research reactor with HEU fuel three decades ago, but as reported in 1995, “opposition to the use of highly-enriched uranium in the reactor's core led to its cancellation.”

A molten chloride reactor does not require HEU fuel, as is clear from the published specifications for planned commercial and demonstration versions of this type of reactor that would use LEU fuel. Thus, using HEU in the MCRE would be a convenience rather than a necessity. When other countries seek HEU fuel for reasons of convenience rather than necessity, the U.S. government on nonproliferation grounds refuses to supply the HEU and tries to block others from doing so.

Converting the MCRE design to use LEU fuel would increase significantly the size of the facility and the amount of fuel, thereby incurring a delay and increasing some costs. However, other costs for security could be reduced since the fuel would switch from Category I to II, lowering the physical protection requirements. Overall, a net cost increase would be likely, as in all prior conversions from HEU to LEU for existing and newly designed reactors, which U.S. policy consistently has justified on grounds of reducing risks of nuclear proliferation and nuclear terrorism.

Considering the grave harm that could be inflicted on U.S. nonproliferation objectives if the U.S. government violated its own longstanding policy of HEU minimization, we urge you to suspend further
work on the MCRE until your department’s Nuclear Energy office develops an alternative LEU design. We further urge you to order the preparation of a Nonproliferation Impact Assessment that examines both the proposed, HEU-fueled MCRE, and an alternative LEU design. Previously, your department has prepared such assessments in at least six instances of proposed actions that, like the MCRE, entail potential nuclear proliferation risks. As your department explained in 1998, such a study “fulfills the DOE commitment to assess the nonproliferation aspects of the various technology options the Department is considering.” If DOE were to proceed with an HEU-fueled MCRE, the damage to national security could exceed any potential benefit from this highly speculative energy technology.

Thank you for considering our concerns, and we look forward to your reply.

Sincerely,

Alan J. Kuperman
Associate Professor, LBJ School of Public Affairs, University of Texas at Austin
Coordinator, Nuclear Proliferation Prevention Project (www.NPPP.org)

Frank N. von Hippel
Senior Research Physicist and Professor of Public and International Affairs emeritus
Program on Science and Global Security, Princeton University

Edwin Lyman
Director of Nuclear Power Safety
Union of Concerned Scientists, Washington, DC

Peter Bradford
Former Commissioner
US Nuclear Regulatory Commission

Victor Gilinsky
Former Commissioner (1975-79)
US Nuclear Regulatory Commission

Allison M. Macfarlane
Director, School of Public Policy and Global Affairs
The University of British Columbia

Thomas M. Countryman
Former Assistant Secretary of State for International Security and Nonproliferation (2011-2017)

Robert Einhorn
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Former Assistant Secretary of State for Nonproliferation

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Former Member of Congress (1997–2015)
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Cc: Corey Hinderstein, Deputy Administrator for Defense Nuclear Nonproliferation, NNSA  
C.S. Eliot Kang, Assistant Secretary for International Security and Nonproliferation, State Department  
Pranay Vaddi, Senior Director for Arms Control and Nonproliferation, National Security Council  
Rep. Chuck Fleischmann, Co-chair, Congressional Nuclear Security Caucus  
Rep. Bill Foster, Co-chair, Congressional Nuclear Security Caucus  
Sen. Dianne Feinstein, Chair, Appropriations Subcommittee on Energy and Water Development  
Sen. Ed Markey
Molten Chloride Reactor Experiment (MCRE)

<table>
<thead>
<tr>
<th>Parameter</th>
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<tr>
<td>Rated Thermal Power</td>
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<tr>
<td>Fuel Salt Mass Flow Rate Range</td>
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<td>HEU Mass</td>
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<td>Heat Removal Method</td>
<td>Gas-Cooled Vessel</td>
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