

# TERRESTRIAL ENERGY USA

January 17, 2023

Project Number: 99902076  
TEUSA Letter #:230117

US Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

**Subject: Terrestrial Energy USA, Inc. Document #TR230117: Principal Design Criteria for IMSR® Structures, Systems and Components Topical Report**

Document Control Desk,

Terrestrial Energy USA (TEUSA) is submitting for review and approval a topical report titled "Principal Design Criteria for IMSR® Structures, Systems and Components." This topical report contains the principal design criteria (PDC) for those systems that provide important functions in support of the operation and safety of the IMSR® plant (also referred to as the IMSR400). The PDC are developed based on the key design features of IMSR® technology and are adapted from the guidance of Revision 0 of Regulatory Guide 1.232, "Guidance for Developing Principal Design Criteria for Non-Light-Water Reactors." The topical report represents the completion of substantial engineering and incorporates feedback provided by the NRC as a result of previous interactions on an earlier PDC white paper.

TEUSA developed its principal design criteria using the SFR-DCs listed in Appendix B of RG 1.232 for a sodium cooled fast reactor. TEUSA assessed the SFR-DCs against the SSCs in the IMSR® design. The TEUSA specific IMSR400 PDCs were either SFR-DCs adopted without modification or modified to account for the unique features of the IMSR400 design.

The TEUSA assessment process determined that thirty-four SFR-DCs could be directly adopted for the IMSR400 design without modification. Twenty-nine SFR-DCs could be adopted with some modification of the guidance criteria to reflect the SSCs incorporated into the IMSR® design or the planned operational characteristics of the IMSR® design. One criterion (SFR-DC 33) was not adopted, and no alternative criterion was proposed because it was not necessary for the IMSR® design.

The PDC will constitute an aspect of a future license application for the IMSR® power plant for which TEUSA will be seeking a Standard Design Approval (SDA) under Part 52. Additional topical reports are planned on a variety of technical topics as outlined in the TEUSA Regulatory Engagement Plan.

TEUSA requests that NRC complete its acceptance review and provide its review schedule for the topical report within 60 days of receipt of this letter. If the TEUSA schedule request cannot be met, TEUSA is prepared to discuss the review outcomes sought, the staff resource requirements, and the schedule for completing the review. TEUSA is prepared to make any of the reference documents within the topical report available for review if the NRC determines that review of the reference documents is necessary to complete the review of the topical report.

Portions of the enclosed topical report are proprietary, and TEUSA requests that it be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390. Enclosure 1 provides the

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proprietary version of the topical report and Enclosure 2 provides the non-proprietary version. An affidavit supporting the withholding request is provided in Enclosure 3.

If you have any questions or need any additional information, please contact Robin Rickman by email at [rickman@terrestrialusa.com](mailto:rickman@terrestrialusa.com) or by phone at 646-687-8212 ext. 523.

Sincerely,



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David Hill  
Chief Technology Officer  
Terrestrial Energy USA

**Enclosures:**

Enclosure 1: "Principal Design Criteria for IMSR® Structures, Systems, and Components Topical Report"  
(Proprietary)

Enclosure 2: "Principal Design Criteria for IMSR® Structures, Systems, and Components Topical Report"  
(Non-proprietary)

Enclosure 3: Affidavit Supporting Request for Withholding from Public Disclosure

**CCs**

*Mo Shams, Director - Division of Advanced Reactors and Non-Power Production and Utilization Facilities (DANU) – Office of Nuclear Reactor Regulation (NRR)*

*Michael Wentzel, Branch Chief - Advanced Reactor Licensing Branch 2 - DANU-NRR*

*Adrian Muñoz, Sr. Project Manager - Advanced Reactor Licensing Branch 2 – DANU-NRR*

## AFFIDAVIT

I, David Hill, state as follows:

- (1) I am the Chief Technology Officer of Terrestrial Energy USA ("TEUSA") and have reviewed the information described in paragraph (2) which is sought to be withheld, and I am the authorizing official for TEUSA to apply for its withholding.
- (2) The information sought to be withheld is contained in Enclosure 1 of TEUSA Letter #230117, "*Principal Design Criteria for IMSR<sup>®</sup> Structures, Systems and Components – Rev A.*" The disclaimer included in the header of each page of the Regulatory Engagement Plan refers to paragraph (3) of this affidavit, which provides the basis for the commercially sensitive determination.
- (3) In making this application for withholding of commercially sensitive information of ... which it is the owner or licensee, TEUSA relies upon the exemption from disclosure set forth in the *Freedom of Information Act* ("FOIA"), 5 U.S.C. Sec. 552(b)(4), and the *Trade Secrets Act*, 18 U.S.C. Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.390(a)(4) for trade secrets (Exemption 4). The material for which exemption from disclosure is here sought also qualifies under the narrower definition of trade secret, within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, *Critical Mass Energy Project v. Nuclear Regulatory Commission*, 975 F.2d 871 (D.C. Cir. 1992), and *Public Citizen Health Research Group v. FDA*, 704 F.2d 1280 (D.C. Cir. 1983).
- (4) The information sought to be withheld is considered commercially sensitive for the reasons set forth in paragraphs (4)b and (4)c shown below. Some examples of categories of information that fit into the definition of commercially sensitive information are:
  - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by TEUSA's competitors without license from TEUSA constitutes a competitive economic advantage over other companies;
  - b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;
  - c. Information that reveals aspects of past, present, or future TEUSA development plans and programs, resulting in potential products to TEUSA;
  - d. Information that discloses trade secrets or potentially patentable subject matter, or both, for which it may be desirable to obtain patent protection.
- (5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by TEUSA, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by TEUSA, not been disclosed publicly, and not been made available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions, or to proprietary or confidentiality agreements that provide for maintaining the information in confidence. The initial designation of this

information as commercially sensitive, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in the following paragraphs (6) and (7).

- (6) Initial approval of commercially sensitive treatment of a document is made by the manager of the originating component, who is the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or who is the person most likely to be subject to the terms under which it was licensed to TEUSA. Access to such documents within TEUSA is limited to a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by a vice president for technical content, competitive effect, and determination of the accuracy of the commercially sensitive designation. Disclosures outside TEUSA are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary or confidentiality agreements, or both.
- (8) The information identified in paragraph (2), above, is classified as commercially sensitive because it contains detailed information regarding TEUSA's licensing plans.
- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to TEUSA's competitive position and foreclose or reduce the availability of profitmaking opportunities. The information is part of TEUSA's licensing strategy. The development of TEUSA's chosen licensing path comprises a substantial investment of time and money by TEUSA. The precise value of the expertise to use in devising this licensing path is difficult to quantify, but it clearly is substantial. TEUSA's competitive advantage will be lost if its competitors are able to use the results of the TEUSA's experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions. The value of this information to TEUSA would be lost if the information were disclosed to the public. Making such information available to competitors without them having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive TEUSA of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing its licensing strategy.

I, David Hill, affirm that I am the Chief Technology Officer of Terrestrial Energy USA, Inc. (TEUSA), that I am authorized by TEUSA to sign and file with the Nuclear Regulatory Commission the Topical Report on IMSR® Principal Design Criteria described in TEUSA Letter #230117, that I am familiar with the contents thereof, and that the statements made and matters set forth therein, and in this affidavit, are true and correct to the best of my knowledge, information, and belief.

Executed on the January 19, 2023



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David Hill  
Chief Technology Officer, Terrestrial Energy USA, Inc.

Notary

STATE OF ARIZONA  
COUNTY OF MARICOPA

This instrument was acknowledged before me  
This 19th day of January, 2023  
in witness whereof I herewith set my hand  
and official seal.  
Cindy Williamson NOTARY PUBLIC

