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Attorneys for Plaintiffs and the Proposed Class

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

NEETA THAKUR, et al., Plaintiffs, vs. DONALD J. TRUMP, et al., Defendants.	Case No. 3:25-cv-04737-RL **DECLARATION OF PLAMEN ATANASSOV IN SUPPORT OF PLAINTIFFS' COMBINED MOTION FOR SUMMARY JUDGMENT AND CLASS CERTIFICATION** Judge: The Honorable Rita F. Lin

I, Plamen Atanassov, declare as follows:

1. I am the Chancellor's Professor of Chemical & Biomolecular Engineering at the University of California, Irvine, and a plaintiff in the above-captioned litigation. I have personal knowledge of the facts set forth herein. If called as a witness, I could and would competently testify to the matters stated. I make this declaration in support of Plaintiffs' Combined Motion for Summary Judgment and Class Certification.

2. The purpose of this declaration is to explain (i) my role in two DOE-grant-funded projects other than ARCHES whose funding was abruptly terminated in October 2025; (ii) the harm to my UC researcher collaborators from termination of these two projects; (iii) the nature of the now-terminated ARCHES California Hydrogen Hub— a large-scale "green hydrogen" project; and (iv) my substantive role in the ARCHES research project, to date and anticipated at the time of termination. This declaration builds upon the declaration that I previously submitted in support of Plaintiffs' Motion for Preliminary Injunction, Docket No. 158.

Non-ARCHES awards: DE-EE0011347 & DE-EE0010751

3. I spent approximately 1,000 hours personally conceptualizing, drafting, or editing application materials for DE-EE0011347 (novel carbon supports), and approximate 550 hours personally drafting or editing application materials for DE-EE0010751 (cathode catalysts). These scientific research projects complement the ARCHES team's work, while demonstrating the reasons for my inclusion in ARCHES. Innovations in materials used to produce fuel cells (the novel carbon supports project) and in processes for fuel cell production (the cathode catalysts project) aim to improve fuel cell performance and lower production costs. This facilitates the transition to green hydrogen, by making it more reliable and affordable. DOE's termination of these awards made me unable to realize the research fruits of my substantial time and creative investment in these projects, in addition to losing the personal funding support they provided, as detailed in my prior declaration (ECF-158).

4. The projects also involved other UC researchers who were financially and professionally harmed by the DOE grant terminations. The novel carbon supports project supported work by four additional UC Irvine researchers:

- Dr. Iryna Zenyuk, Director of the National Fuel Cell Research Center at UCI, whose project role was development of novel catalyst ink formulations and strategies to incorporate the newly developed carbons in catalysts layers for successful implementation in advanced heavy-duty truck fuel cells.
- Dr. Camille Roiron, a postdoctoral researcher with expertise in energy nano-materials design and nano-materials characterization, whose role was to analyze nano-structured carbon materials and to propose integration paths for their decoration with platinum nanoparticles for enhanced activity and durability.
- Dr. Bilal Iskandarani, a postdoctoral researcher with expertise in carbon nanostructures forming and processing whose role was to build catalyst layers functional nanostructures facilitating gaseous transport and ionic conductivity from carbon nano-materials designed in the project.
- Jiazhe (Loki) Chen, a graduate student researcher whose project role was to characterize carbon nano-materials with a set of methods involving gas adsorption and microscopy, and to develop and validate electrochemical methods for rapid and accurate structural study of carbon nano-materials' interfacial properties.

Each of these researchers lost income, the results of their research efforts, and potential publications, patents, and other anticipated intellectual products. Jiazhe (Loki) Chen additionally lost ability to continue his work towards a PhD in Chemical Engineering from UCI, and had to discontinue his education with a terminal MS degree (which he completed with excellence). Dr. Camille Roiron and Dr. Bilal Iskandarani both lost their research positions with UCI, as the grants they were employed have been terminated.

The cathode catalysts project likewise included UCI co-researchers:

- Dr. Vojislav Stamenkovic, who is a world-renowned expert and pioneer in integrating surface science and electrocatalysis and introducing nano-structured materials in electrocatalysis. Dr. Stamenkovic was the main PI and technical contact on the project. His role was to develop new, nanostructured platinum metal and platinum alloy electrocatalysts based on his breakthrough discovery of underlying metal effect on activity and durability.

- Dr. Zenyuk also had a significant role in this project. She was the Co-PI of the project, fully responsible for the integration of newly developed electrocatalysts into functional membrane-electrode assemblies for heavy-duty truck applications.

Each of these researchers lost income and research productivity due to DOE's grant termination.

ARCHES award, DE-CD0000041

5. In the grant paperwork for the ARCHES, I described my expected post-grant-award role as "Senior Advisor for Business Development." This (somewhat arbitrarily chosen) title should not obscure the fact that my role necessarily involved advanced scientific research that specifically addressed the need to meet industrial expectations of materials and devices for deployment. I chose my title simply to reflect the experience I have and expertise I would bring to the science/business interface in a project that involves both market introduction *and* ongoing testing and continual iteration of technology. Both business and scientific knowledge are important to address conditions that arise when new technologies are deployed in real-world rather than controlled laboratory conditions.

6. My role in ARCHES, and indeed, DOE's financial support for the project, can only be understood with reference to the "Technology Readiness Levels" that inform agency grantmaking in the technology sphere. Technology Readiness Levels (TRLs) are a measurement system developed by the National Aeronautics and Space Administration (NASA) to describe a continuum of scientific research from conceptualization through commercialization of a new technology.

7. There are nine TRLs in NASA's system, each representing a specific stage of technological maturity. At TRL Level 1, scientists have only observed and reported on basic scientific principles related to their aim. By TRL Level 3, scientists have typically developed a proof-of-concept, but have not yet validated their innovation in a laboratory environment. By the time a project is at TRL 6, scientists have developed a physical prototype and demonstrated it in a relevant environment (*e.g.*, ground or space). Every TRL level is "research," involving specialized technical expertise. A true and correct copy of the description of NASA's TRL framework,

obtained from the agency's web site, is attached as **Exhibit A**.

8. Adopting and adapting NASA's basic framework, DOE also uses TRLs to describe the attributes of early, mid-stage, and late-stage energy technology innovations. A true and correct copy of DOE's framework for TRLs for energy efficiency and renewable energy innovations, obtained from the agency's web site, is attached as **Exhibit B**.

9. DOE's TRL scale goes from TRL 1 to TRL 8. Per Exhibit B, at TRL 1, "[t]echnology is ready to transfer from [basic] scientific research to applied research."

10. As I know directly from receipt of numerous DOE grants, the agency funds research at all TRL stages. As examples: my terminated grant for novel carbon supports involves a technology at TRL 3 at the start, and aims to conclude at TRL 5. My terminated grant for cathode catalysts involves a technology at TRL 2 at the start, and was aiming to achieve TRL 4. The purpose of a DOE award is uniformly to move an innovative technology further along the eight-TRL level spectrum.

11. DOE uses the same grant-making processes for projects at different TRL levels.

12. But for project termination, my role in ARCHES was contemplated to involve transitioning the technology from TRL 6 and 7 to the final level, TRL 8. Per DOE's description, TRL 8 marks when "technology is ready to move from development to commercialization," and no longer needs scientific research support.

13. TRL 7 is characterized by a need for scientific specialists to work closely with potential industry users of new technologies to address and innovate around issues that arise when a technology transitions from being tested in a laboratory in controlled conditions to being deployed at scale in the real world. As I well know from 40 years of involvement in technical electrochemistry—which includes 90 patented inventions in the U.S., with more than 20 of them licensed and 6 products on the market based on my patents—the progression is bumpy when moving from (a) use of innovative materials, through (b) process engineering, to (c) formulation of a new product, and (d) integration of that product into larger technical and economic systems. Shelf-ready solutions simply do not work in the real world, and require successive technical iteration. My post-award roles in ARCHES were thus anticipated to build on my experience

commercializing innovations in fuel cells and electrolyzers, which are two of the critical components for the hydrogen research. These roles were a function of both my scientific expertise and ability to work effectively with industry partners in the transition from TRLs 6 and 7 to TRL 8.

14. At the time of DOE's termination of the ARCHES grant, I was in ongoing discussion with ARCHES's then-CEO, Angelina Galiteva, regarding the extent of my potential compensation for continuing to assist with the project, *i.e.*, the degree to which I would be paid for the ongoing time I expected to devote to the project. Even in the absence of compensation, I had devoted more than 1,200 hours to the ARCHES project over the two-year period spanning post-award up to the time of grant termination.

15. My post-award work on ARCHES included: preparing a White Paper for the Working Group on Hydrogen Production, Distribution, and Storage, for which I was project lead; participating in more than 50 meetings; participating in three in-person workshops (at Lawrence Berkeley National Laboratory, UC Irvine, and UCLA); and participating in four on-site visits.

16. Additionally, at the time of grant termination, I was in the early stages of formulating three lines of research work important to commercial deployment of hydrogen fuel: (i) Maritime Use of Hydrogen Derivatives (Ammonia and Methanol); (ii) Hydrogen and Hydrogen Derivates for Aerospace; and (iii) Hydrogen Derivates (Ammonia) for Food Safety. But for DOE's termination of the ARCHES grant, I would have continued this research conceptualization and would been the lead researcher for item (i), irrespective of payment.

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17. As stated in my previous declaration: I hoped that my contributions to the ARCHES project and team, which has the potential to create U.S. production capacity for a non-polluting, limitless, and storable energy source, would be the capstone achievement of my career. The loss of this opportunity through DOE's grant termination has been personally and professionally devastating.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on this 8th day of July 2026, at Florence, Italy.

Plamen Atanassov

EXHIBIT A

2 MIN READ

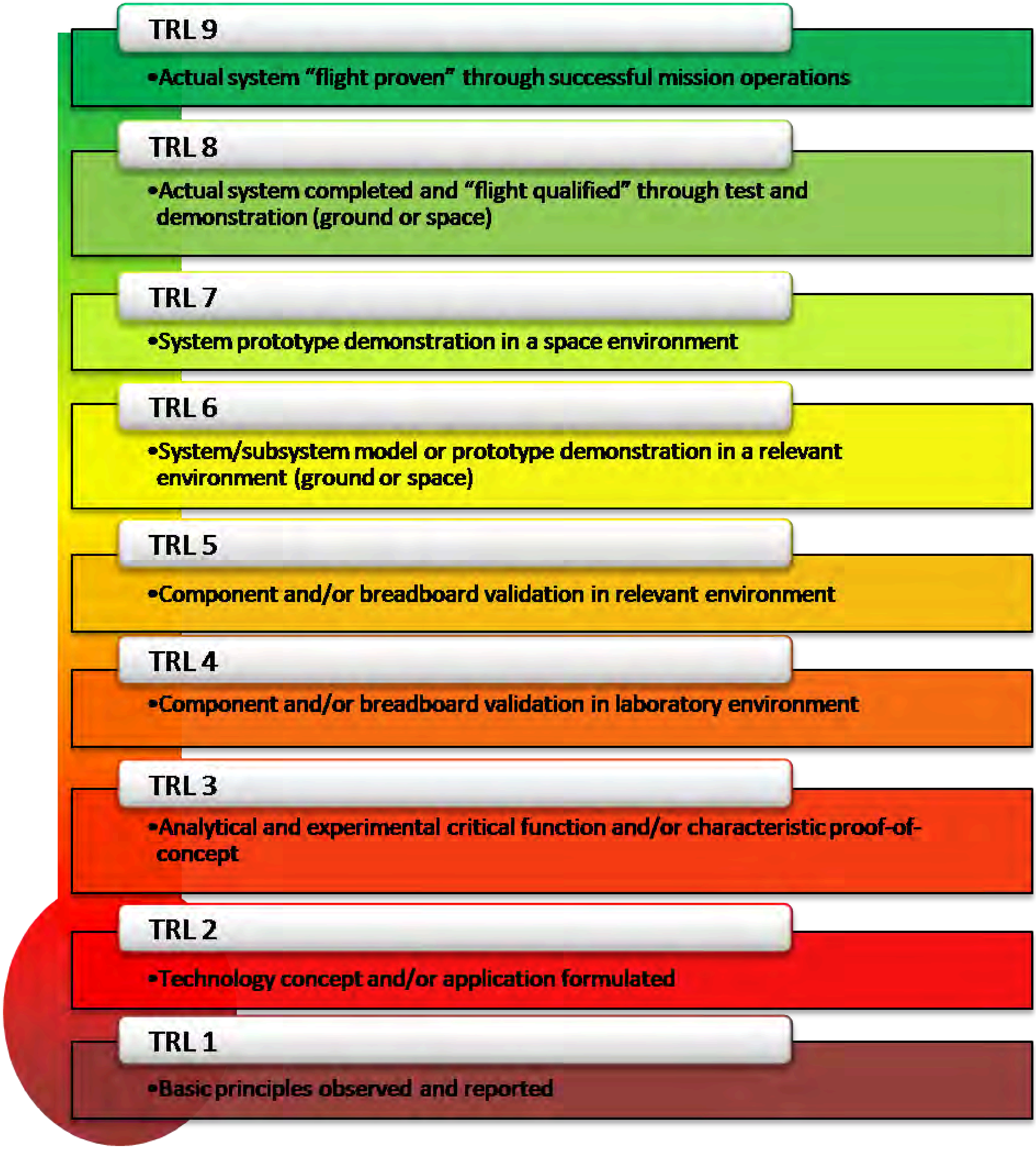
Technology Readiness Levels

Catherine G Manning

SEP 27, 2023

ARTICLE

Technology Readiness Levels (TRL) are a type of measurement system used to assess the maturity level of a particular technology. Each technology project is evaluated against the parameters for each technology level and is then assigned a TRL rating based on the projects progress. There are nine technology readiness levels. TRL 1 is the lowest and TRL 9 is the highest.



Technology Readiness Levels

When a technology is at TRL 1, scientific research is beginning and those results are being translated into future research and development.

TRL 2 occurs once the basic principles have been studied and practical applications can be applied to those initial findings. TRL 2 technology is very speculative, as there is little to no experimental proof of concept for the technology.

When active research and design begin, a technology is elevated to TRL 3. Generally both analytical and laboratory studies are required at this level to see if a technology is viable and ready to proceed further through the development process. Often during TRL 3, a proof-of-concept model is constructed.

Once the proof-of-concept technology is ready, the technology advances to TRL 4. During TRL 4, multiple component pieces are tested with one another.

TRL 5 is a continuation of TRL 4, however, a technology that is at 5 is identified as a breadboard technology and must undergo more rigorous testing than technology that is only at TRL 4. Simulations should be run in environments that are as close to realistic as possible.

Once the testing of TRL 5 is complete, a technology may advance to TRL 6. A TRL 6 technology has a fully functional prototype or representational model.

TRL 7 technology requires that the working model or prototype be demonstrated in a space environment.

TRL 8 technology has been tested and “flight qualified” and it’s ready for implementation into an already existing technology or technology system.

Once a technology has been “flight proven” during a successful mission, it can be called TRL 9.

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Page Last Updated: **Jun 25, 2026** Page Editor: **Catherine G. Manning**

Responsible NASA Official: **Abigail Bowman**

EXHIBIT B

Technology Readiness Levels (TRLs): Identify the readiness level of the technology associated with the project as well as the planned progression during the course of project execution. A detailed explanation of the rationale for the estimated technology readiness level should be provided. Specific entry criteria for the next higher technology readiness level should be identified. The following definitions apply:

1. **TRL-1**. Basic principles observed and reported: Scientific problem or phenomenon identified. Essential characteristics and behaviors of systems and architectures are identified using mathematical formulations or algorithms. The observation of basic scientific principles or phenomena has been validated through peer-reviewed research. Technology is ready to transition from scientific research to applied research.

2. **TRL-2**. Technology concept and/or application formulated: Applied research activity. Theory and scientific principles are focused on specific application areas to define the concept. Characteristics of the application are described. Analytical tools are developed for simulation or analysis of the application.

3. **TRL-3**. Analytical and experimental critical function and/or characteristic proof of concept: Proof of concept validation has been achieved at this level. Experimental research and development is initiated with analytical and laboratory studies. System/integrated process requirements for the overall system application are well known. Demonstration of technical feasibility using immature prototype implementations are exercised with representative interface inputs to include electrical, mechanical, or controlling elements to validate predictions.

4. **TRL-4**. Component and/or process validation in laboratory environment- Alpha prototype (component): Standalone prototyping implementation and testing in laboratory environment demonstrates the concept. Integration and testing of component technology elements are sufficient to validate feasibility.

5. **TRL-5**. Component and/or process validation in relevant environment- Beta prototype (component): Thorough prototype testing of the component/process in relevant environment to the end user is performed. Basic technology elements are integrated with reasonably realistic supporting elements based on available technologies. Prototyping implementations conform to the target environment and interfaces.

6. **TRL-6**. System/process model or prototype demonstration in a relevant environment- Beta prototype (system): Prototyping implementations are partially integrated with existing systems. Engineering feasibility fully demonstrated in actual or high fidelity system applications in an environment relevant to the end user.

7. **TRL-7**. System/process prototype demonstration in an operational environment- Integrated

pilot (system): System prototyping demonstration in operational environment. System is at or near full scale (pilot or engineering scale) of the operational system, with most functions available for demonstration and test. The system, component, or process is integrated with collateral and ancillary systems in a near production quality prototype.

8. **TRL-8**. Actual system/process completed and qualified through test and demonstration-Pre-commercial demonstration: End of system development. Full-scale system is fully integrated into operational environment with fully operational hardware and software systems. All functionality is tested in simulated and operational scenarios with demonstrated achievement of end-user specifications. Technology is ready to move from development to commercialization.