PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Agenda ID# 22607
ENERGY DIVISION **RESOLUTION E-5329**
June 20, 2024

R E S O L U T I O N

Resolution E-5329. Confirmation of candidates for appointment to the Diablo Canyon Independent Safety Committee (DCISC) for a three-year term beginning July 1, 2024.

PROPOSED OUTCOME:

- The California Public Utilities Commission (CPUC) ratifies the President's selection of candidates for consideration by the Chair of the California Energy Commission (CEC) for appointment to the DCISC.

SAFETY CONSIDERATIONS:

- The DCISC reviews operations at Pacific Gas and Electric Company's (PG&E) Diablo Canyon Power Plant (DCPP) for the purpose of assessing the safety of current operations and suggesting recommendations for continued safe operations. The appointed candidate will serve a three-year term on the DCISC.

ESTIMATED COST:

- All ongoing DCISC costs were funded previously. Ratification of the CPUC President's selection of candidates for appointment to the DCISC will not result in any additional costs.

As required by D.23-08-004, dated August 10, 2023.

SUMMARY

The Diablo Canyon Independent Safety Committee (DCISC) consists of three members, each appointed in turn by the California Governor, the California Attorney General, and the Chair of the California Energy Commission (CEC), serving staggered three-year terms. Section 1.B of the Third Restated Charter for the DCISC describes the process for

appointment of DCISC members: it requires the CPUC to select and forward to the appointing authority no more than three new candidates plus the incumbent for DCISC membership. The appointing authority for the current cycle is the Chair of the CEC. This Resolution ratifies the California Public Utilities Commission (CPUC or Commission) President's selection of Dr. Najmedin Meshkati, Dr. Michael D. Quinn, and Dr. Raluca Scarlat as candidates for appointment to the DCISC, for a three-year term commencing on July 1, 2024.

BACKGROUND

Establishment of the DCISC and Member Selection Process:

The CPUC created the DCISC in Decision (D.) 88-12-083 as part of the overall settlement of ratemaking issues for the DCPP, which is owned and operated by Pacific Gas and Electric Company (PG&E). SB 846, signed into law by Governor Newsom on September 2, 2022, requires the CPUC to consider the potential extension of operations at the DCPP, that the DCISC continue operations through such time as all spent nuclear fuel has been moved to dry storage at the DCPP Independent Spent Fuel Storage Installation, and that the DCISC continue to make findings and recommendations appropriate to enhance the safety of the operation of the DCPP.[1] The DCISC is an independent, three-member committee responsible for monitoring the safety of PG&E's operation of DCPP. The DCISC conducts site visits at the DCPP, holds public meetings, and issues an annual report summarizing its activities and reviews of DCPP operations and provides findings and recommendations regarding DCPP operational safety. The DCISC's budget for 2024-2025 is primarily paid out of PG&E's revenues and charged to PG&E's ratepayers, with SB 846-related incremental costs recovered from the State through the Diablo Canyon Transition and Relicensing Memorandum Account (DCTRMA).[2] D.88-12-083 established the qualifications and procedures for

[1] Pub. Util. Code Section 712.1.

[2] D.88-12-083, Appendix C, Paragraph 16; Pub. Util. Code Section 712.1 requires the CPUC to ensure the funding of the DCISC to attract qualified experts during the period of extended operations at the DCPP. As such, DCISC member compensation and budgetary needs for DCPP's transition-phase beyond amounts already being paid by PG&E ratepayers were authorized for DCTRMA recovery in D.23-08-004 (R.23-01-007), Ordering Paragraph 3.

appointment of members to the DCISC and defined the scope of the Committee's operations and responsibilities.[3] Membership on the DCISC is a compensated position.[4]

On October 24, 2006, the DCISC submitted Application (A.) 06-10-024 proposing a restated charter. The CPUC adopted the Restated Charter in D.07-01-028 on January 25, 2007.

Submission of a Second Restated Charter was authorized in Ordering Paragraph 3 of D.21-09-003 on September 9, 2021, and approved in Advice Letter 6361-E on December 9, 2021.

Submission of the Third Restated Charter was authorized in Ordering Paragraph 4 of D.23-08-004 on August 10, 2023, and approved in Advice Letter 7034-E on September 25, 2023.[5]

Section 1.B of the Third Restated Charter describes the process for appointment of DCISC members. It requires the CPUC to select no more than three candidates for DCISC membership from among those applicants responding to an open request by the CPUC for applications. The incumbent member whose term is about to expire is to be deemed an additional candidate if they consent. The CPUC is charged with the responsibility to provide for public comment on the applicants' qualifications and potential conflicts of interest. The President of the CPUC is to review the applicants'

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[3] D.88-12-083, Appendix C, Attachment A; *See also* Pub. Util. Code Sections 712.1(c) and (e).

[4] In Resolution E-3152, the Commission established that DCISC member compensation be set at levels commensurate with fees paid by PG&E for comparable services. The compensation levels set in E-3152 have since been revised several times, most recently on September 25, 2023, in PG&E Advice Letter (AL) 7034-E. The current compensation levels are as follows: annual retainer of $10,800; $270/hour fee for attendance at DCISC meetings; $270/hour fee for DCISC work performed outside of committee meetings in excess of 40 hours/year; and reimbursement of expenses incurred in performance of DCISC work.

[5] The approval of Advice Letter 7034-E and the text of the Third Restatement of the Charter for the Diablo Canyon Independent Safety Committee (in Attachment 2) are available at: https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_7034-E.pdf.

qualifications, experience, and background, including any conflicts of interest,[6] together with any public comments, and propose as candidates to the appointing authority only persons with knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues. The Energy Division prepares a draft resolution ratifying the President's selection of candidates for the Commission.

Current Applicants:

On January 12, 2024, an open request for applications to fill the July 1, 2024, vacancy on the DCISC was posted on the CPUC's website.[7]

Applications were timely received from Dr. Mardy Kazarians, Dr. Najmedin Meshkati, Dr. Michael Quinn, and Dr. Raluca Scarlat.

Dr. Kazarians' application describes his work in risk assessment and process safety management for nuclear power and nuclear fuel processing, among other things, while serving as the principal of Kazarians & Associates, in addition to his work as a nuclear engineer and leader in fire risk assessments for nuclear power plants.

Dr. Meshkati's application details his experience teaching and conducting research on the safety, risk reduction, and reliability enhancement of nuclear power plants while a Professor at the University of Southern California, in addition to serving on professional boards and as an adviser to the U.S. State Department. Dr. Meshkati was previously selected by the Commission as one of the qualified candidates considered for appointment in 2022 and 2023.[8]

In Dr. Quinn's application, he describes his experience working in the nuclear power industry, and consulting on nuclear operations and safety for industry clients as well as

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[6] As conflicts of interest are a legal question, their review was conducted by the CPUC's legal department which the President then approved.

[7] A link to the announcement posted on the CPUC's website was sent to the service lists of A.21-12-007 and R.23-01-007 to ensure that parties interested in issues relating to the DCPP were aware of the announcement. A.21-12-007 is PG&E's 2021 Nuclear Decommissioning Cost Triennial Proceeding; R.23-01-007 is the Rulemaking implementing SB 846.

[8] CPUC Resolution E-5213 (June 2, 2022) and CPUC Resolution E-5272 (June 29, 2023).

the U.S. and Canadian governments. Dr. Quinn was previously selected by the Commission as one of the qualified candidates considered for appointment in 2014, 2015, 2017, 2018, 2019, 2020, 2021, 2022, and 2023.[9]

The application of Dr. Scarlat details her expertise in chemistry and materials for nuclear fusion and fission energy, advanced nuclear reactors, safety analysis, and engineering ethics as a Professor in the UC Berkeley Nuclear Engineering Department. Dr. Scarlat also serves on the Nuclear Energy Advisory Committee for the Department of Energy as well as the Nuclear Safety Committee and Advisory Committee for the UC Davis McClellan Nuclear Research Reactors.

Public Comments on Applicants:

On March 4, 2024, an announcement was posted on the CPUC's website inviting comments on the candidates.[10] Summaries of their qualifications were included with the announcement. The full text of the public comments received is included in Appendix B of this Resolution.

Comments in support of Dr. Kazarians nomination were submitted by Dr. George Apostolakis, Dr. Robert Budnitz, and Dr. Ali Mosleh. Dr. Apostolakis, the Director of the Nuclear Risk Research Center in Japan and former Commissioner on the U.S. Nuclear Regulatory Commission, recommends Dr. Kazarians for the DCISC due to his pioneering work on fire risk assessment at nuclear plants. Dr. Budnitz, a current member of the DCISC writing in a personal capacity, supports Dr. Kazarians' nomination due to his thorough knowledge of nuclear plant safety, technical judgment, and deep understanding of fire safety. Dr. Mosleh, an engineering professor at UCLA, recommends Dr. Kazarians on the basis of their frequent work together on nuclear power plant risk studies, his background in nuclear engineering and safety and risk analysis, especially fire risk; and his extensive work developing methods for nuclear plant probabilistic risk analysis in both the public and private sectors.

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[9] *See* CPUC Resolution E-4657 (June 12, 2014), CPUC Resolution E-4711 (February 26, 2015), CPUC Resolution E-4849 (June 16, 2017), CPUC Resolution E-4936 (May 31, 2018), CPUC Resolution E-5001 (June 13, 2019), CPUC Resolution E-5081 (June 11, 2020), CPUC Resolution E-5145 (May 20, 2021), CPUC Resolution E-5213 (June 2, 2022), and CPUC Resolution E-5272 (June 29, 2023).

[10] A link to the announcement was also sent to the service lists of A.21-12-007 and R.23-01-007. *See* footnote 7 above.

Comments in support of Dr. Meshkati's appointment were submitted by Sarah Brady, Earl Carnes, Bill Hoyle, Susan Kotowski, and Jean Merrigan. Ms. Brady, Interim CEO of the California Council on Science and Technology, supports Dr. Meshkati based on his scientific knowledge and expertise, integrity, and professionalism, as well as her organization's extensive work with him on risk and safety issues. Mr. Carnes, a former Senior Advisor at the Department of Energy, recommends Dr. Meshkati for the DCISC based not only on his technical and professional qualifications, but on his expertise in the field of risk reduction in complex technological systems and his specific work on this topic for nuclear power systems. Mr. Hoyle, a former manager and investigator for the U.S. Chemical Safety Board, supports Dr. Meshkati's appointment based on twenty years of work together on safety investigations for the U.S. Chemical Board and his expertise in organizational and safety operations at nuclear power plants. Ms. Kotowski, the President of Human Factors and Ergonomics Society, supports Dr. Meshkati's appointment based on his expertise in the safety, reliability, and efficiency of large-scale, complex systems, especially with respect to human factors and safety culture; his 39-years of work on nuclear safety; and his multidisciplinary approach to nuclear safety. Ms. Merrigan, Executive Director of Women's Energy Matters, supports Dr. Meshkati's candidacy based on his work addressing risk reduction and reliability enhancement of complex technical systems, his background in nuclear power plant safety issues, and the different perspective he will bring to the DCISC.

Comments in support of Dr. Quinn's appointment were submitted by Rochelle Becker, Michael Coyle, Matthew Sunseri, Richard Swanson, and Mila Vujovich-LeBarre. Ms. Becker, Executive Director for the Alliance for Nuclear Responsibility, supports the nomination of Dr. Quinn based on his acknowledgment that the "human performance aspects of nuclear power operations" will be critical for the DCISC as the power plant faces many technical challenges in the next few years, the fresh eyes he will bring to DCPP oversight, his technical background, and his experience in nuclear plant operations. Mr. Coyle, a retired U.S. Navy Rear Admiral, recommends Dr. Quinn based on their work together on several nuclear safety assessments at government facilities for his professionalism, insight, and focus. Mr. Sunseri, a nuclear industry professional, recommends Dr. Quinn based on his nuclear power plant experience, his consulting experience in event and organization analysis, and his service as a board member and chairman of a community board. Mr. Swanson, formerly a senior manager at several nuclear plants, supports Dr. Quinn's candidacy due to his "scrupulous ethics," his willingness to communicate hard truths, and his professional credentials and work experience. Ms. Vujovich-LeBarre, Chair of the Sierra Club's Santa Lucia Chapter, endorses Dr. Quinn for his

extensive experience overseeing management at 40+ nuclear units and assessing complex systems.

Comments in support of Dr. Scarlat's appointment were submitted by Robert Budnitz, Michael Corradini, Massimiliano Fratoni, Digby MacDonald, Sonja Schmid, and Rachel Slaybaugh. Dr. Budnitz, a current member of the DCISC writing in a personal capacity, supports Dr. Scarlat's candidacy due to her broad knowledge of nuclear-reactor engineering, her strong understanding of how reactor operations and design interact "to achieve the desired safety level," and her insight into safety culture and the role of regulations and agencies in helping achieve reactor safety. Dr. Corradini, a professor of Nuclear Engineering, recommends Dr. Scarlat for her nationally known expertise in nuclear reactor safety and plant operation with an emphasis in chemistry and corrosion, and her focus on transparency and engagement with local communities to ensure proper communication of risk at Diablo Canyon. Dr. Fratoni, also a professor of Nuclear Engineering, recommends Dr. Scarlat for her leadership abilities, technical expertise in nuclear materials, and long list of accomplishments. Dr. MacDonald, another professor of Nuclear Engineering, supports Dr. Scarlat's candidacy due to her exemplary work on nuclear material sciences and the technical diversity she would bring to the DCISC. Dr. Schmid, a professor of Science and Technology, strongly recommends Dr. Scarlat due to her "deep understanding for the social contract involved in the implementation of complex, high-risk technical systems such as a nuclear plant" and her combination of "technical aplomb…[,] integrity, analytical brilliance[,] …empathy, …excellent work ethics [and] collegiality…[as well as her] deep knowledge and diverse experience in the field of nuclear safety…." Dr. Slaybaugh, a climate change venture capitalist and MS/PhD in Nuclear Engineering and Engineering Physics, highly recommends Dr. Scarlat for her safety management experience, deep technical knowledge of nuclear reactors, strong sense of ethics, her broad range of experience with nuclear safety, training, nuclear materials, corrosion and thermal-hydraulics; and her "critical and measured stance on how risks are managed and communicated."

NOTICE

Notice of this Resolution was made by publication in the CPUC's Daily Calendar. A copy of the Draft Resolution was sent to all of the applicants and to those submitting comments on their behalf. A copy of the Draft Resolution was also sent to the Chair of the CEC and to the service lists of PG&E's 2021 Nuclear Decommissioning Cost

Triennial proceeding (A.21-12-007) and R.23-01-007, the Commission's Rulemaking implementing SB 846.

DISCUSSION

The third restated charter adopted in D.23-08-004 and Advice Letter 7034-E requires that candidates for appointment to the DCISC be persons with knowledge, background, and experience in the field of nuclear power facilities and nuclear safety issues who demonstrate they have no conflicts of interest.[11]

Summaries of the qualifications of each applicant are included in Appendix A of this Resolution.

Dr. Najmedin Meshkati is qualified to serve on the Diablo Canyon Independent Safety Committee.

Dr. Meshkati is a Professor of Civil/Environmental Engineering, Industrial & Systems Engineering, and International Relations at the University of Southern California, where he has taught and researched for 39 years, created a Nuclear Energy option in one of the engineering programs, created and taught graduate level courses about nuclear safety and safety culture, and conducted research on the safety, risk reduction, and reliability enhancement of complex technological systems including nuclear power plants. His expertise in human-systems integration, and safety culture helped him serve as a member and technical advisor on a national panel convened to determine lessons learned from the Fukushima Nuclear Accident and recommend safety and security improvements for U.S. nuclear plants accordingly. Additionally, Dr. Meshkati has researched, visited, and inspected nuclear plants around the world including Chernobyl and Fukushima Daiichi; received research grants from the NRC; attended and given

[11] Conflicts of interest guidelines are set forth in Section I.C of the second restated charter. They establish limits for DCISC members on income and gifts from PG&E or an affiliated company, and investments in PG&E or an affiliate. They also prohibit members of the DCISC from attempting to use their position to influence action of the Committee in which they have a financial interest. DCISC members are required to file a Statement of Economic Interest in the same manner as designated CPUC employees. No person shall serve on the DCISC who has a prior history of supporting or opposing PG&E as a witness or intervenor in nuclear licensing or CPUC proceedings associated with the Diablo Canyon Power Plant.

talks on his nuclear safety research at national and International Atomic Energy Agency (IAEA) conferences; and he had written and testified to the U.S. Commission on Improving the Effectiveness of the United Nations on the importance of the IAEA for global nuclear safety. Dr. Meshkati has a Ph.D. in industrial systems engineering from USC; an M.S. in Engineering Management; and a B.S. in Industrial Engineering and a B.A. in Political Science from Sharif (Arya-Meher) University of Technology in Iran and Shahid Beheshti University (National University of Iran), respectively.

Dr. Meshkati has no conflicts of interest that would preclude his serving on the DCISC. His qualifications show that he has knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues.

Dr. Michael Quinn is qualified to serve on the Diablo Canyon Independent Safety Committee.

Dr. Quinn has spent over forty years in the nuclear industry: since 1999 he has worked as an executive operations assessor and consultant to the U.S. and Canadian commercial nuclear power industry facilitating regulatory compliance, reliability assessments, and performance improvement; during the 25 years prior he worked in the power block of a nuclear unit for a large nuclear utility. His experience includes developing and delivering root cause evaluation training to NRC staff, assessing significant issues during refueling operations at nuclear power plants, and leading root cause assessments at nuclear facilities. Dr. Quinn has also managed teams that developed and implemented corrective actions to address performance at over 30 nuclear facilities/units – including Diablo Canyon – and for three regulators in the United States and Canada. He has led teams in developing, implementing, and evaluating programs to establish a safety culture at nuclear power plants. Dr. Quinn has experience facilitating the shutdown of nuclear plants: maintaining operational excellence as closure approaches, retaining staff and addressing their concerns, and working to uphold plant safety culture and a safety conscious work environment. Dr. Quinn has taught nuclear safety event causal analysis to the U.S. Nuclear Regulatory Commission, the Canadian Nuclear Safety Commission, and the Japan Nuclear Regulation Authority. Dr. Quinn has a Doctorate in Organizational Management Systems and an Executive Master of Business Administration degree, both from the University of New Haven, and a B.S. degree in Chemistry from Charter Oak College. He previously held a U.S. NRC Senior Reactor Operator License on a Westinghouse pressurized water reactor, and is a Certified Root Cause Investigator, Certified Root Cause Training Instructor, and Certified Radiation Safety Officer.

Dr. Quinn has no conflicts of interest that would preclude his serving on the DCISC. His qualifications show that he has knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues.

Dr. Raluca Scarlat is qualified to serve on the Diablo Canyon Independent Safety Committee.

Dr. Scarlat is a Professor of Nuclear Engineering at the University of California, Berkeley, in the field of chemistry, materials, and reactor safety. In addition to teaching courses in those fields, she serves as the head undergraduate curriculum advisor for the Department of Nuclear Engineering and chairs the committee on ethics and social responsibility for the College of Engineering. Her research at UC Berkeley encompasses chemistry and materials for nuclear fusion and fission energy as well as other clear energy applications, plus she built the SALT research group which conducts high temperature experimental studies for molten salts and high temperature materials, particularly beryllium and radioactive materials. Dr. Scarlat previously taught thermal hydraulics and nuclear reactor safety at the University of Wisconsin, Madison. In 2009, Dr. Scarlat was awarded an Excellence Award in Nuclear Energy Fuel Cycle Research and Development from the Department of Energy and a three-year fellowship at the DOE. In 2021, she was awarded the American Nuclear Society Mary Jane Oestmann Professional Women's Achievement Award. Dr. Scarlat has previously conducted research on accident progression at the Fukushima Dai-Ichi plant to make recommendations for improving severe accident management at boiling water reactors in Japan; and she also researched advanced reactor licensing. She has served as a member of the working group for the Development of ANS 20.2 Standard, Nuclear Safety Design Criteria and Functional Performance Requirements for Liquid-Fuel Molten Salt Reactor Nuclear Power Plants, and on the American Society of Mechanical Engineers standards task group on graphite issues for Molten Salt Reactors. She currently serves on the Nuclear Energy Advisory Committee for the DOE, Office of Nuclear Energy, and on the Nuclear Safety Committee and the Advisory Committee for UC Davis' McClellan Nuclear Research Reactors in Sacramento. Dr. Scarlat has a Ph.D. in Nuclear Engineering with designated emphasis in Energy, Science, and Technology, an M.S. in Nuclear Engineering, both from UC Berkeley, as well as a Certificate in Management of Technology from Berkeley's Haas School of Business. She also has a B.S. in chemical and biomolecular engineering from Cornell University.
Dr. Scarlat has no conflicts of interest that would preclude her serving on the DCISC. Her qualifications show that she has knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues.

Dr. Mardy Kazarians is qualified to serve on the Diablo Canyon Independent Safety Committee.

The application of Dr. Kazarians demonstrates that he has no preclusive conflicts of interest and that he has the requisite knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues to be considered qualified for the DCISC. A summary of his qualifications can be read in Appendix A.

Since the restated charter restricts the candidates for the DCISC to the incumbent and up to three additional applicants, Commission President Alice Reynolds has selected the three most qualified candidates out of this year's applicant pool for consideration by the Chair of the CEC. As such, Dr. Kazarians is not included on the final list of candidates that will be submitted to the CEC Chair.

The candidates nominated by the Commission are the most qualified candidates from the pool of applicants.

The CPUC's President, Alice Reynolds, has reviewed the qualifications, experience, and backgrounds of all the applicants and selected Dr. Najmedin Meshkati, Dr. Michael Quinn, and Dr. Raluca Scarlat for submission to the Chair of the CEC as candidates for the three-year DCISC position beginning July 1, 2024.

President Alice Reynolds' selection of Dr. Najmedin Meshkati, Dr. Michael Quinn, and Dr. Raluca Scarlat as the candidates for the July 1, 2024 vacancy on the Diablo Canyon Independent Safety Committee is ratified.

President Alice Reynolds' selection of Dr. Meshkati, Dr. Quinn, and Dr. Scarlat as candidates for appointment to the DCISC for a three-year term beginning July 1, 2024, is ratified. As mentioned above, President Reynolds recognizes that all of the applicants possess the qualifications to competently serve on the DCISC. The President's selections shall be provided to the Chair of the CEC.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review. Please note that comments are due 20 days from the mailing date of this resolution. Section 311(g)(2) provides that this

30-day review period and 20-day comment period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day review and 20-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

FINDINGS

1. D.88-12-083 created the Diablo Canyon Independent Safety Committee (DCISC).
2. SB 846 continued the DCISC requiring that the DCISC continue operations through such time as all spent nuclear fuel has been moved to dry storage at the DCPP Independent Spent Fuel Storage Installation and that it continues to make findings and recommendations appropriate to enhance the safety of the operation of the DCPP.
3. The DCISC is an independent, three-member committee responsible for monitoring the safety of PG&E's operation of the Diablo Canyon Power Plant.
4. D.07-01-028 adopted a restated charter for the DCISC including revised procedures for appointments of DCISC members.
5. D.21-09-003 ordered the submission of a second restated charter in an advice letter. The second restated charter for the DCISC was submitted in Advice Letter 6361-E and approved on December 9, 2021.
6. D.23-08-004 ordered the submission of a third restated charter in an advice letter. The third restated charter for the DCISC was submitted in Advice Letter 7034-E and approved on September 25, 2023.
7. On January 12, 2024, in accordance with D.23-08-004 and Advice Letter 7034-E, an announcement was posted on the CPUC's website seeking applications for the July 1, 2024, vacancy on the DCISC.
8. The Chair of the CEC is the appointing authority for the July 1, 2024, vacancy on the DCISC.
9. Dr. Najmedin Meshkati, a Professor of Civil/Environmental Engineering, Industrial & Systems Engineering, and International Relations, responded to the CPUC's January 12, 2024, announcement, and submitted an application to be considered as a candidate for appointment to the DCISC.

10. Dr. Michael Quinn, a professional nuclear energy consultant, responded to the CPUC's January 12, 2024, announcement, and submitted an application to be considered as a candidate for appointment to the DCISC.

11. Dr. Raluca Scarlat, a Professor of Nuclear Engineering, responded to the CPUC's January 12, 2024, announcement, and submitted an application to be considered as a candidate for appointment to the DCISC.

12. Dr. Mardy Kazarians, a nuclear engineer specializing in nuclear risk assessment and process safety management, responded to the CPUC's January 12, 2024, announcement, and submitted an application to be considered as a candidate for appointment to the DCISC.

13. The CPUC invited comments on Dr. Kazarians', Dr. Meshkati's, Dr. Quinn's, and Dr. Scarlat's qualifications in an announcement posted on the CPUC's website on March 4, 2024.

14. Comments supporting the appointment of Dr. Kazarians, Dr. Meshkati, Dr. Quinn, and Dr. Scarlat to the DCISC were received in response to the CPUC's March 4, 2024, announcement inviting comments.

15. The CPUC's President, Alice Reynolds, has reviewed the qualifications, experience, and backgrounds of Dr. Kazarians, Dr. Meshkati, Dr. Quinn, and Dr. Scarlat.

16. Dr. Kazarians, Dr. Meshkati, Dr. Quinn, and Dr. Scarlat have knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues, and are qualified candidates for appointment to the DCISC.

17. President Alice Reynolds has chosen to provide the names of Dr. Meshkati, Dr. Quinn, and Dr. Scarlat as candidates for appointment to the DCISC for a three-year term beginning July 1, 2024.

18. President Alice Reynolds' selection of Dr. Meshkati, Dr. Quinn, and Dr. Scarlat as the candidates for appointment to the DCISC for a three-year term beginning July 1, 2024, should be ratified and provided to the Chair of the CEC.

THEREFORE IT IS ORDERED THAT:

1. President Alice Reynolds' selection of Dr. Meshkati, Dr. Quinn, and Dr. Scarlat as qualified candidates for consideration by the Chair of the CEC for appointment to the Diablo Canyon Independent Safety Committee for a three-year term beginning July 1, 2024, is hereby ratified.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on June 20, 2024; the following Commissioners voting favorably thereon:

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Rachel Peterson
Executive Director

APPENDIX A

The following statements were supplied by the applicants as part of the application process and were available for public review and comment starting on March 4, 2024. The assertions of fact contained within these statements have not been disputed. These statements are provided verbatim.

Dr. Mardy Kazarians

Mr. Kazarians, principal of Kazarians & Associates, Inc., has worked in the risk assessment, risk management and process safety fields since the early 1980's. Has conducted risk assessments for a wide range of systems and processes from nuclear power, nuclear fuel processing, chemicals processing, oil and gas refining and aerospace industries. As part of these projects, Dr. Kazarians has conducted risk assessments using a variety of methods, has developed safety risk management programs and helped owners and operators in implementing these programs.

Educated as nuclear engineer from UCLA, was one of the first students that studied WASH-1400. That study did not address fire risk within nuclear plants. After Browns Ferry fire in 1975, Dr. Kazarians focused on fire risk initiated within a nuclear plant and developed the methodology for addressing that risk as part of his master's degree thesis and Ph.D. dissertation. He improved on that method by applying it to nuclear plants domestically and internationally. He had the opportunity to conduct fire risk at a large number of plants and review them done by others. Now he still remains one of the prominent leaders in fire risk for nuclear power plants.

The main part of fire risk was its uncertain and probabilistic nature. Dr. Kazarians studied probability theory, uncertainty analysis and statistical methods. These methods proved useful in his later career when the fundamental risk methods were applied to other processes.

Dr. Kazarians has made significant contributions to more than 16 major Fire PRAs and risk assessment projects for nuclear power plants in the U.S., Europe, Japan and Russia. In the last twenty years, in addition to risk analyses of specific facilities, Dr. Kazarians has participated in several major projects for the U.S. Nuclear Regulatory Commission (NRC). He has reviewed the fire analysis portion of a large number of Independent Plant Evaluation for External Events (IPEEEs) submitted by various power utilities to the NRC.

He was the principal author of NUREG/CR-2258, the first comprehensive Fire PRA methodology treatise for nuclear power plants. Later, Dr. Kazarians contributed to the development of NUREG/CR-6850, which was published in 2005 and provided the latest Fire PRA methodology and underlying data. He also contributed to the writing of ANS Standard on Fire PRA Methodology. Later he was hired by the Japanese utilities to rewrite NUREG/CR-6850 using the latest developments. He put together a team of experts for this task and the methodology document was published in 2019.

Dr. Kazarians became an independent consultant in 1992 and provided consulting services to non-nuclear clients as well as nuclear power clients. He applied the same methods to non-nuclear processes and presented them to owners and operators of those processes. As part of that, he learned the importance of training and operating procedures. He implemented his ideas on safe plant operation from small water treatment operations to large refineries. He learned about the methods and processes of water and wastewater treatment, aerospace manufacturing, chemicals processing and oil and gas refineries.

Dr. Najmedin Meshkati

Dr. Najmedin Meshkati is a (tenured, full) Professor of Civil/Environmental Engineering, Industrial & Systems Engineering; and International Relations at the University of Southern California (USC); an Associate (ex-Research Fellow) with the Project on Managing the Atom at Belfer Center for Science and International Affairs at Harvard Kennedy School; and has been an Associate with the Mossavar-Rahmani Center for Business and Government at Harvard (2018-2020).

Meshkati was a Jefferson Science Fellow and a Senior Science and Engineering Advisor, Office of Science and Technology Adviser to the Secretary of State, US State Department, Washington, DC (2009-2010). He is a Commissioner of The Joint Commission (a not-for-profit organization that accredits and certifies thousands of healthcare organizations and programs in the United States and operates in many countries around the world) and on the Governance Board of the Patient Safety Movement Foundation. He is a member of the NASEM (National Academies of Sciences, Engineering and Medicine) Gulf Offshore Energy Safety (GOES) Board and served for two terms (2016-2022) on the NASEM Board on Human-Systems Integration (BOHSI). In January 2023, he was appointed to the FAA Expert Panel to conduct a congressionally-mandated review of Boeing's safety management processes and Boeing's safety culture as a part of the Aircraft Certification, Safety & Accountability Act (ACSAA), Section 103 Organization Designation Authorization (ODA). He has served as a member of the Global Advisory Council of the Civilian Research and Development Foundation (CRDF) Global, chaired by Ambassador Thomas R. Pickering (2013-2016).

For the past 38 years, he has been teaching and conducting research on risk reduction and reliability enhancement of complex technological systems, including nuclear power, aviation, petrochemical and transportation industries. He has been selected by

the National Academy of Sciences (NAS), National Academy of Engineering (NAE) and National Research Council (NRC) for his interdisciplinary expertise concerning human performance and safety culture and served as member and technical advisor on two national panels in the United States investigating two major recent accidents: The NAS/NRC Committee "Lessons Learned from the Fukushima Nuclear Accident for Improving Safety and Security of U.S. Nuclear Plants" (2012-2014); and the NAE/NRC "Committee on the Analysis of Causes of the Deepwater Horizon Explosion, Fire, and Oil Spill to Identify Measures to Prevent Similar Accidents in the Future" (2010-2011).

Dr. Meshkati has inspected many petrochemical and nuclear power plants around the world, including Chernobyl (1997), Fukushima Daiichi and Daini (2012). He has worked with the U.S. Chemical Safety and Hazard Investigation Board, as an expert on human factors and safety culture, on the investigation of the BP Refinery explosion in Texas City (2005) and served as a member of the National Research Council (NRC) Committee on Human Performance, Organizational Systems and Maritime Safety. He also served as a member of the NRC Marine Board's Subcommittee on Coordinated R&D Strategies for Human Performance to Improve Marine Operations and Safety.

Dr. Meshkati is the only full-time USC faculty member who has continuously been conducting research on human factors and aviation safety-related issues (e.g., cockpit design and automation, crew resource management, safety management system, safety culture, and runway incursions,) and teaching in the USC 69-year-old internationally renowned Aviation Safety and Security Program, for the past 30 years. During this period, he has taught in the "Human Factors in Aviation Safety" and "System Safety" short courses. From 1992 to 1999, he also was the Director and had administrative and academic responsibility for the USC Professional Programs, which included Aviation Safety, as well as for the Transportation Safety, and Process Safety Management (which he designed and developed) programs. He has worked with numerous safety professionals from all over the world and has taught safety short courses for private and public sector organizations, including the US Navy, US Air Force, US Forest Service, California OSHA, Celgene, Metrolink, Exelon, FedEx, the Republic of Singapore Air Force, Singapore Institution of Safety Officers, China National Petrochemical Corporation, Canadian upstream oil and gas industry (Enform), Korea Hydro and Nuclear Power (KHNP), Ministry of Foreign Affairs (Republic of Korea), etc.

Dr. Meshkati has been recognized by the Human Factors and Ergonomics Society (HFES) in 2022, as an inaugural "Titan of HFES"; he is an elected Fellow of the HFES; the 2015 recipient of the HFES highest award, the Arnold M. Small President's Distinguished Service Award, for his "career-long contributions that have brought

honor to the profession and the Society"; and the 2007 recipient of the HFES Oliver Keith Hansen Outreach Award for his "scholarly efforts on human factors of complex, large-scale technological systems." He is the inaugural recipient of the Ernest Amory Codman Lectureship and Award (from The Joint Commission for his leadership and efforts in continuously improving the safety and quality of care). He is an AT&T Faculty Fellow in Industrial Ecology, a NASA Faculty Fellow (Jet Propulsion Laboratory, 2003 and 2004), and a recipient of the Presidential Young Investigator Award from the National Science Foundation (NSF) in 1989.

He has received numerous teaching awards at USC, which include the 2013 Steven B. Sample Teaching and Mentoring Award from the USC Parents Association, the 2000 TRW Award for Excellence and Outstanding Achievement in Teaching from the USC Viterbi School of Engineering; the 1996, 2003, 2006, 2007, 2008 and 2016 Professor of Year Award (Excellence in Teaching and Dedication to Students Award) from the Daniel J. Epstein Department of Industrial & Systems Engineering; the Mortar Board's Honored Faculty Award (2007-2008) from the University of Southern California's Chapter of the Mortar Board; and the Outstanding Teaching Award from The Latter-day Saint Student Association at USC (April 11, 2008). He was chosen as a Faculty Fellow by the Center for Excellence in Teaching, USC (2008-2010).

He is the co-editor and a primary author of the book Human Mental Workload, North-Holland, 1988. His articles and commentaries on public policy; the risk, reliability, and environmental impact of complex, large-scale technological systems; and foreign policy-related issues have been published in several national and international newspapers and magazines such the New York Times, International New York Times (International Herald Tribune), Los Angeles Times, Washington Post, Wall Street Journal, Financial Times, The Economist, The Hill, Baltimore Sun, Charleston Gazette, Houston Chronicle, Sacramento Bee, MIT Technology Review, Japan Times, Korea Herald (South Korea), Strait Times (Singapore), Times of India, Hurriyet Daily News (Turkey), Gulf Today (UAE), The Nation (UAE), Gulf News (Qatar), Iran News (Iran), Shargh (Iran), South China Morning Post (Hong Kong), Winnipeg Free Press, Waterloo Region Record, Windsor Star (Canada), Scientific Malaysian, etc.

As chairman of the "group of experts" of the International Ergonomics Association (IEA), Dr. Meshkati coordinated international efforts which culminated in the joint publication of the United Nations' International Labor Office (ILO) and IEA Ergonomic Checkpoints: Practical and Easy-to-Implement Solutions for Improving Safety, Health and Working Conditions book in 1996, for which he received the Ergonomics of

Technology Transfer Award from the IEA in 2000. According to the ILO, this book has so far been translated and published into 16 languages including Arabic, Bahasa Indonesia, Bahasa Malaysian, Chinese, Estonian, Farsi, French, Japanese, Korean, Polish, Portuguese, Russian, Spanish, Thai, Turkish, and Vietnamese. The second edition of this book was released by the ILO/IEA in 2010.

Dr. Meshkati simultaneously received a B.S. in Industrial Engineering and a B.A. in Political Science in 1976, from Sharif (Arya-Meher) University of Technology and Shahid Beheshti University (National University of Iran), respectively; a M.S. in Engineering Management in 1978; and a Ph.D. in Industrial and Systems Engineering in 1983 from USC. He is a Certified Professional Ergonomist.

Dr. Michael Quinn

Michael Quinn is a seasoned nuclear executive operations assessor and consultant who has been continuously engaged in commercial nuclear or government nuclear reactor sites since 1975. During this time he has assessed: nuclear operations; supporting technical disciplines; and nuclear site nuclear safety management systems' performance at over 40 nuclear units in the U.S. and Canada.

A native of Connecticut, Michael has invested nearly 50 years into the public health and safety of the nuclear power industry, entailing 25 years as a licensee in the operations power block at a nuclear power station, followed by the past 24 years as an executive operations assessor and consultant to nuclear facilities in the U.S. and Canada.

Cumulative Nuclear Operations Assessment Experience

The first 25 years of Michael's nuclear industry experience entailed becoming qualified and subsequently becoming an authority in nuclear operations and supporting technical disciplines that are essential to understanding the safe operation risk envelope and governance of a nuclear power reactor plant and overall station performance.

During Michael's tenure as a licensee within the power block of a Westinghouse pressurized water reactor station (Diablo Canyon is a Westinghouse-designed PWR), he earned a US NRC Senior Reactor Operator License (SRO), which he maintained for 15 years. During this time frame Michael was a member of the senior station leadership team at Haddam Neck Station, a nuclear unit that consistently performed at U.S. NRC SALP-1 and INPO-1 performance levels (presently termed U.S. NRC ROP Column 1 and INPO-1 respectively).

Positions held: Director of Nuclear Station Services; Nuclear Station Duty Officer; Chair-Nuclear Plant Operations Review Committee [operations oversight including 50.59 Reviews]; Corrective Action Review Board (CARB) Chair; Director of Nuclear Station Emergency Operations (DSEO); Refueling and Maintenance Outage Shift Manager; Manager of Chemistry and Radiochemistry. His last licensee position was as a Recovery Project Manager, reporting to the President, on a three-unit, four-year Nuclear Station Recovery Team (Millstone Nuclear Power Station 1995-1999).

As an executive operations assessor over the last 24 years, Michael has applied and assessed the three cross-cutting underpinnings of nuclear power operations in a high-reliability organizations e.g., nuclear power facilities: Human Performance, Problem Identification and Resolution, and Safety Culture/Safety Conscious Work Environment as they contribute to the effective implementation of the seven cornerstones of a nuclear station's operations , which Michael has also assessed at nuclear facilities in the US and Canada:

Initiating Events
Barrier Integrity
Emergency Preparedness
Mitigating Systems
Public Radiation Safety
Occupational Radiation Safety
Security/ Safeguards

Since 1999 Michael has provided independent evaluations and assessments of nuclear facilities in the United States and Canada on the seven cornerstones and three cross-cutting areas as they underpin nuclear operations and high reliability performance.

While in his varied assignments he has assessed nuclear operations, incidents, significant events, and trends; then has developed informed, balanced observations, conclusions, and recommendations based on facts and empirical evidence, and not on what some may have wanted the facts to be.

In his assignments Michael has provided independent assessments to utility executives, nuclear operations management, federal and state agencies, from which recommended corrective actions have addressed the substantive problems, the causal factors that enabled the problems, and the processes that should have identified and addressed the causal factors at an earlier, safer, more risk compliant time. He has presented findings in closed and open settings, as well as in public forums with regulators, town halls, and public stakeholders.

Following are a few independent assessment examples Michael has been engaged in:

- January 2024: member of a two-person independent team completed a several month safety culture/safety conscious work environment assessment at Columbia Nuclear Generating Station in Richland WA
- In 2023 led an independent team that assessed Safety Culture and technical programs at the NIST Center for Neutron Research (NCNR) in Gaithersburg MD; there had been a significant reactor event in 2021 that resulted in nuclear fuel damage (melted fuel); the reactor had been shut down for two years and placed into Column 4 of US NRC IP 95003. Access the publicly available team report here: https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML23207A041
- In 2022, led an independent Team that assessed, over several months, a series of significant events, Conduct of Operations, and Safety Culture, at the Department of Energy's trans-uranic waste repository Waste Isolation Pilot Plant (WIPP) outside Carlsbad NM
- Provided requested independent assessments of significant and 'unplanned' nuclear events at >20 nuclear power units in the United States and Canada 2000-2022 (e.g., reactor transients, transuranic uptakes, program breakdowns)
- Conducted independent Operational Reliability assessments at >20 nuclear facilities in the US and Canada 2000-2022
- Conducted Technical Engineering Rigor and ConOps assessments, including 15 nuclear safety-related units/facilities (e.g., a large Department of Energy engineering remediation project for management of 50MM gallons of nuclear mixed waste; and an Independent Spent Fuel Storage Installation [ISFSI])
- Member of a team that conducted a several month Reliability Assessment of Vermont Yankee for the State of VT: Lead assessor of the Root Cause process within the Corrective Action Program evaluation, for feasibility of plant license extension beyond the 40-year license
- Taught Operational and Event Causal Analysis (a 24-hour course) to the US Nuclear Regulatory Commission over 50 times entailing >600 Inspectors and technical staff; contracted 2006-2023 (in this course Dr. Quinn and a colleague have taught US NRC staff how to evaluate nuclear station event analysis reports and their associated corrective action implementation effectiveness; this training also entailed teaching safety culture assessment)
- Taught Operational and Event Causal Analysis (the 24-hour course adapted) to the Japan Nuclear Regulation Authority (JNRA) staff as well as to Canada Nuclear Safety Commission (CNSC) staff.

What Dr. Quinn can bring to the DCISC:

Upon appointment Dr. Quinn expects to bring a current and comprehensive nuclear operations assessment body of work experience to the Committee. Additionally, his first-hand experience assessing significant challenges that have impacted nuclear facilities scheduled for shutdown . . . while still safely operating to the final "breaker opening." This assessment experience applies to Diablo Canyon in the context of a permanent shutdown at some point:

- Assessing factors for maintaining Operational Excellence prior to permanent shutdown
- Assessing factors that maintain (or indicate decline in) conduct of operations focus on and fidelity to plant systems, structures, and components; as well as to procedure, program, policy, and license requirements
- Assessing extent to which the organization maintains the expected performance level of the cross-cutting areas: Safety Culture, Human Performance, and PI&R, as the station approaches permanent shutdown

Closing

Michael earned a Doctorate in Organizational Management Systems (organizational system dynamics), and prior to that effort he had completed an Executive Master of Business Administration degree and had earned a Bachelor of Science degree in Chemistry. Other endeavors include:

- Certified Root Cause Investigator (Nuclear Safety Review Concepts Event Evaluation)
- Certified Root Cause Training Instructor
- Certified Radiation Safety Officer
- Dozens of written technical assessment reports on nuclear facility events and issues
- Over 20 invited talks and nuclear conference presentations (available on request)
- Having taught 24 full semester courses (including System Dynamics and Strategic Management/Decision Making courses) at Central Connecticut State University

His collective current and past nuclear power experience is congruent with the Diablo Canyon Independent Safety Committee's (DCISC) mission and requirements. He can bring current and comprehensive assessment experience, from dozens of nuclear facilities, specific to nuclear oversight's seven cornerstones and the three cross-cutting

areas: safety culture; human performance; and problem identification and resolution, to supplement the depth and breadth of the DCISC team.

Dr. Quinn has a demonstrated history of articulating his assessments in an objective, empirically-based, and plain language manner to a spectrum of stakeholders (e.g., utility commissions, the public, station staff, state and federal regulators, interest groups, and the boardroom).

On a personal note:

From 2002-2011 and 2012-2021, Dr. Quinn served on the Connecticut Community Care Inc. (CCC) Board of Directors, a non-profit health care service provider of 250 employees who are responsible for over 9,000 compromised individuals in need. His last CCC role was Chair of the Board.

Michael is a four-decade American Red Cross blood donor.

LinkedIn: https://www.linkedin.com/in/quinnmd/

Dr. Raluca Scarlat

Professor Raluca O. Scarlat is an Associate Professor in the Nuclear Engineering Department at University of California Berkeley. Her research encompasses chemistry and materials for nuclear fusion and fission energy and other clean energy applications, such as solar energy, batteries, and critical minerals. She has expertise in electrochemistry and physical chemistry of high-temperature molten salt and graphite, corrosion, tritium management, advanced nuclear reactors, safety analysis, and engineering ethics.

Scarlat attended high school in Fremont, CA for two years, and community colleges in Cupertino, Los Altos Hills, San Mateo, and Redwood City, CA, and for the subsequent two years. She completed her undergraduate studies at Cornell University in Ithaca, NY, where she studied chemical and biomolecular engineering for three years, during which she completed two engineering co-op semesters with GE Silicones and the GE Global Research center, interfacing with plant and unit operators, chemical engineers deploying new products, and chemists developing new synthetic pathways for new products. She graduated cum laude in May 2006, where Scarlat worked as a chemical engineer for ExxonMobil, developing and deploying abnormal event detection applications for petrochemical plants, and training engineers and operators in the

development and use of advanced controls applications; she received a Leadership Award from the ExxonMobil Automation & Optimization Division in Dec. 2006.

In 2007, Scarlat joined University of California Berkeley for graduate studies in nuclear engineering to study safety analysis of large complex systems, and to understand what role nuclear energy can play in energy portfolios. For her work as a teaching assistant in thermodynamics, she was recognized with the Outstanding Graduate Student Instructor in 2008. In 2009, Scarlat completed an M.S. in the Nuclear Engineering Department, and a Certificate in Management of Technology from the Haas School of Business and was awarded an Excellence Award in Nuclear Energy Fuel Cycle R&D from the US Department of Energy in 2009, and a three-year Graduate Fellowship from Nuclear Engineering University Programs (NEUP) of the US Department of Energy. In fall of 2011, after the Fukushima Dai-Ichi Nuclear Power Plant accident, Scarlat joined Hitachi GE, in Ibaraki Prefecture, Japan, for an engineering internship, to study severe accident progression at Fukushima Dai-Ichi Units 1 and 2, for the purpose of making recommendations towards improving severe accident management at the boiling water reactors. (BWRs) in Japan. In 2012, she completed her Ph.D. in Nuclear Engineering with Designated Emphasis in Energy Science and Technology. She continued research on advanced reactor licensing at UC Berkeley until 2014, when she joined as faculty at University of Wisconsin Madison, in the field of thermal-hydraulics and reactor safety.

In January 2019, she joined University of California Berkeley, as faculty in the nuclear engineering department, in the field of chemistry, materials, and reactor safety. She teaches courses on nuclear fuel cycle, materials and chemistry, and thermodynamics. She serves as the head undergraduate curriculum adviser for the Department of Nuclear Engineering and chairs the committee on ethics and social responsibility for the College of Engineering. She has built that SALT research group, with cutting edge capabilities in high temperature experimental studies for molten salts and high temperature materials, with the unique capability of handling both beryllium, which is respiratory and dermal hazard, and radioactive materials; in the current semester, there are eight graduate students, two postdoctoral scholars, and fifteen undergraduate students training and performing research in the SALT Lab. Prior students and postdoctoral scholars are now faculty, research scientists at national laboratories, and engineers in advanced reactor companies.

Prof. Scarlat has co-authored 42 journal publications, 37 refereed conference proceedings, and a book chapter. Prof. Scarlat has been awarded the American Nuclear Society (ANS) Mary Jane Oestmann Professional Women's Achievement Award in 2021. She has served as a working group member for the Development of ANS 20.2 Standard,

"Nuclear Safety Design Criteria and Functional Performance Requirements for Liquid-Fuel Molten Salt Reactor Nuclear Power Plants.," and on the American Society of Mechanical Engineers (ASME) standards task group on graphite issues for Molten Salt Reactors (MSRs). Prof. Scarlat serves on the Nuclear Energy Advisory Committee (NEAC) for the US Department of Energy, Office of Nuclear Energy. She serves on the Nuclear Safety Committee and the Advisory Committee for UC Davis' McClellan Nuclear Research Reactors in Sacramento, CA.

Employing nuclear energy relies on a strong social contract. It relies on stable institutions, on an independent regulator to ensure adequate operation, maintenance, and inspection of the plants, it relies on risk communication and engagement with local communities – it relies on transparency, and enabling the local communities to have agency in how the risks to their community are managed and communicated; the definitions of acceptable and unacceptable risk are and should continue to be defined by society, and it is the engineer's role to implement the society-defined goals for the management and communication of risks. Guided by these principles, professor Scarlat applies her expertise is the areas of (1) Nuclear Reactor Safety and Thermal-Hydraulics, (2) Materials and corrosion, (3) Plant Operation, and (4) Engineering Ethics.

These areas are of relevance to (1) understanding inspection and maintenance, sensor calibration, interfacing with Nuclear Regulatory Commission (NRC) inspections, necessary operator and staff training, human factors considerations, regulations and procedures, severe accident management guidelines, understanding application of safety principles, functioning principles of passive and active safety systems, probabilistic risk assessment for the units; (2) corrosion control, materials degradation, environmental monitoring and transport of radioisotopes in the environment; (3) adequate staffing and training, outage planning, sensors and controls, refueling operations, emergency preparedness, worker safety, and the role of the safety culture.

END OF APPENDIX A

APPENDIX B

The following are all of the public comments submitted regarding the applicants for the Diablo Canyon Independent Safety Committee. The comments are grouped by candidate and are provided verbatim.

Massachusetts Institute of Technology
George Apostolakis
Professor Emeritus
Department of Nuclear Science & Engineering
Phone 240-731-3245
Email apostola@mit.edu

March 1, 2024

David Zizmor, Esq.
Public Utilities Regulatory Analyst
California Public Utilities Commission – Energy Division
505 Van Ness Avenue
San Francisco, CA 94102
DAVID.ZIZMOR@CPUC.CA.GOV

Subject: Candidacy of Dr. Mardy Kazarians for the Diablo Canyon Safety Committee

Dear Mr. Zizmor,

I have known Mardy for about 40 years. He was my graduate student at UCLA working on his MS and Ph.D. theses. His work entailed the development of a probabilistic methodology for the assessment of risks from internal fires in nuclear power plants. At that time, there was no such methodology in the literature and the regulations were deterministic and very conservative.

This methodology, along with a computer code for fire propagation that another student developed, was immediately used by utilities and showed that fire could be a significant contributor to plant risk. Upon graduation, Mardy joined the consulting firm PLG, Inc. and participated in the pioneering risk assessments for the Zion and Indian Point plants and other studies.

Soon the U.S. Nuclear Regulatory Commission started issuing reports on fire risk methodology employing Mardy as a major contributor.

After he became an independent consultant, Mardy worked on non-nuclear hazardous facilities and helped them to show that they met California regulations. He continued his work for nuclear utilities. In recent years, he got involved in the performance of risk assessments of accidents initiated by internal floods.

Mardy works well with people and I think he will be a valuable member of the safety commission.

Sincerely,

Dr. George Apostolakis
Director, Nuclear Risk Research Center, Japan
Professor Emeritus, MIT
Former Commissioner
U.S. Nuclear Regulatory Commission
Member, National Academy of Engineering

Robert J. Budnitz
734 The Alameda
Berkeley CA 94707
home telephone (510)527-9775
email: budnitz @ pacbell.net

25 March 2024

Nominations
c/o David Zizmor, Energy Division, California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
david.zizmor@cpuc.ca.gov

SUBJECT: Letter in support of Dr. Mardy Kazarians for the DCISC

[Although I am currently a member of the Diablo Canyon Independent Safety Committee, this letter is being written by me personally and is not being sent in my official capacity as a DCISC member.]

I am writing this letter to support the appointment of Dr. Mardy Kazarians to the Diablo Canyon Independent Safety Committee (DCISC). I am currently a member of the DCISC and have been a member since mid-2007, when I was appointed to a 3-year term by then-Attorney General Brown. I was reappointed by AG Brown for another term in mid-2010, reappointed again in mid-2016 by Attorney General Harris, reappointed again in mid-2019 by AG Becerra, and again in 2022 by AG Bonta.

Dr. Kazarians' qualifications are outstanding. I have known him and worked with him off-and-on for about 40 years. He would bring to the DCISC not only excellent and through knowledge about nuclear power-plant safety, but also a strong record of independence and of excellent technical judgment.

Mardy's specific credentials relevant to the work of the DCISC seem to me to be an excellent match. The DCISC's scope includes evaluations of the overall safety of Diablo Canyon as manifested in dozens of individual activities, programs, and performance areas, from the reliability of compact valves to the efficacy of operator training to the assurance that the plant's safety culture is appropriate, to assuring that major programs like fire safety and radiological-protection safety are as strong as required, and on and on. Mardy's experience, going back 40 years or more, has involved many different opportunities to perform safety analyses covering the entire scope.

Although Mardy's work has been very broad, he has one particular area of deep expertise, in fire safety, the area where he started his career. Fortunately, that area interfaces with almost all other aspects of plant safety, covering *inter alia* all of the

topics I mentioned just above, plus a zillion others. I know from experience: my own deepest expertise is in seismic safety of nuclear plants, but its interface with almost every other area has also been a way for me to understand how a large nuclear power plant's overall safety is achieved. Ditto with Mardy. Understanding fire safety, which the safety community recognizes to be one of the most important sources of potential risk to the plant, covers not only plant design but plant operations and safety culture. I have high confidence that Mardy's overall expertise is strong and deep and thorough.

In his earliest area of deep expertise, fire safety, Mardy quickly emerged as one of a small number of leading practitioners. He became world-renowned, based on having broken new ground in methods of analysis and in explaining how to use the insights from analysis to improve safety. His influence has also been important in helping to provide the whole fire-safety community, internationally, with guidance documents explaining how to analyze fire safety and then how to go about improving it where needed.

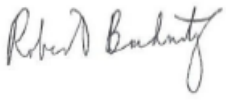
Another aspect of Mardy's work that stands out is his excellent judgment. He's well known internationally as a technical consultant. You can't achieve his reputation and make it last for decades without being known for your impartial judgment. Otherwise, how could Mardy have been brought in frequently to help a large organization (an electric utility or a large reactor design firm or a government regulatory agency) to sort out a complex technical problem? An internationally known private consultancy like Mardy's simply could not survive for decades unless his work has been consistently characterized as being excellent both technically and in terms of judgment.

Mardy is also well known for his ability to work with less-skilled engineers: his long history in training and mentoring speaks for itself on that score.

He also has an excellent understanding of how a review committee like the DCISC can be most effective in carrying out its mission of helping to inform the State of California about the safety of the power plant at Diablo Canyon. And he is a really nice person too! And a Californian!

Based on having known Mardy Kazarians for about 4 decades, I believe his career has been exemplary. In my view, his appointment to the DCISC would be a great service to the citizens of California.

Sincerely,



[original signed by Robert J. Budnitz]

B. John Garrick Institute for the Risk Sciences
UCLA ENGINEERING

Office of the Director
410 Westwood Plaza, Box 159510
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TEL: 310. 825.5534

April 4, 2024

Mr. David Zizmor, Esq. (he/him)
California Public Utilities Commission – Energy Division

Recommendation in Relation to the nomination of Dr. Mardy Kazarians to serve on the State of California's Diablo Canyon Independent Safety Committee

I understand that Dr. Mardy Kazarians has been nominated to serve a 3-year term on the State of California's Diablo Canyon Independent Safety Committee (DCISC). I am taking this opportunity to offer strong support for the nomination as in my opinion Dr. Kazarians is uniquely qualified for the position. I have known Dr. Kazarians for nearly 5 decades going back to our time as graduate students in Nuclear Engineering at UCLA (1975-1980). Since then, I have had the opportunity to work with Mardy on numerous comprehensive nuclear power plant risk studies and many chemical process safety projects. We both served on national and international expert panels and advisory committees, more recently for the U.S. Nuclear Regulatory Commission, Japan Nuclear Regulatory Authority, and the International Atomic Energy Agency.

Dr. Kazarians is among a very small number of experts in the country with a unique set of qualifications, namely a formal education in nuclear engineering with focus on safety and risk analysis, pioneering work on developing methods for nuclear plant probabilistic risk analysis (PRA), over 4 decades of experience as independent safety expert in the energy sector, serving both the private and public sectors. He is highly respected internationally as a leading nuclear power safety expert, due in part to his extensive field work, many accident investigations, large number of publications in technical journals, and numerous technical reports including industry guidebooks and safety standards.

Dr. Kazarians is particularly famous for his seminal work on nuclear power plant fire risk. In his numerous projects on the subject, he analyzed more than 15 plants for potential fire causes and impact of on the plant risk. These required intimate knowledge of plant physical layout and systems configuration that protect from failures leading to core damage. In addition, Dr. Kazarians served on review panel of more than ten external events PRAs submitted to the Nuclear Regulatory Commission (NRC) as part of the Independent Plant Evaluation for External Events (IPEEE) program. He was also the primary author of the guidelines for nuclear power plant fire risk published in 2005. More recently the Nuclear Risk Research Center (NRRC) of Japan asked him to develop a similar guidebook for Japan. This resulted in the publication of the most comprehensive guidebook on the subject four years ago. Dr. Kazarians is also the author of a similar guidebook for nuclear power plant internal flood risk.

Through many years of professional collaboration with Dr. Kazarians I developed deepest appreciation of his professional and personal integrity, fair-mindedness, objectively, and clarity in articulation of his technical findings and judgements. His calm and highly collaborative manner in technical exchanges and teamwork, and thoughtfulness when faced with a difficult issue, are exemplary. He would be an outstanding addition to DCISC.

Sincerely

Ali Mosleh, PhD., NAE
Distinguished University Professor
Founding Director, The B. John Garrick Institute for the Risk Sciences
UCLA, www.risksciences.ucla.edu

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February 7, 2024

David Zizmor, Esq.
Public Utilities Regulatory Analyst
California Public Utilities Commission – Energy Division

Subject: Recommendation in Support of Najmedin Meshakti's Appointment to the Diablo Canyon Independent Safety Commission (DCISC)

Dear Mr. Zizmor,

It is with great enthusiasm that I offer my full support of the appointment of Dr. Najmedin Meshkati to the Diablo Canyon Independent Safety Committee (DCISC).

California is home to many of the world's leading education and research institutions. At CCST—a nonpartisan, nonprofit organization created at the request of the State Legislature 35 years ago—we believe California's policies are stronger with science. We work with scientists from across this broad network to provide science and technology advice to state decision makers. As such, I have experienced firsthand that Dr. Meshkati has the extensive knowledge and expertise required to serve on DCISC and will fulfill the responsibilities of his appointment with the utmost integrity and professionalism.

Dr. Meshkati is a nationally recognized expert on the safety, reliability, and efficiency of large-scale, complex systems, including nuclear power plants, with over 35 years of teaching, interdisciplinary research, and leadership in the field. He has demonstrated a continued dedication to leveraging his expertise to inform policy making decisions, serving as a member and technical advisor on two national panels convened by the National Academies of Science, Engineering Medicine to investigate major events: the Fukushima Nuclear disaster and the Deepwater Horizon explosion.

I and my team at CCST had the pleasure of working with Dr. Meshkati on a report commissioned by the CPUC to determine the long-term viability of underground natural gas storage in California. Dr. Meshkati served on the report's Steering Committee, a group of experts who helped guide the report authors, write conclusions and recommendations based on findings of the authors, and write an executive summary for the report. Dr. Meshkati was integral to the chapter of the report which explored the risks to health, safety, environment, and gas storage system infrastructure at California subsurface gas storage facilities. He went above and beyond his role as a Steering Committee member, authoring a section published in the report on the importance of effective and healthy safety culture, drawing from his many years of expertise on risk reduction and safety in the nuclear and oil and gas industries. The recommendations in that chapter of the report were actionable and impactful due to Dr.

"Making California's Policies Stronger with Science and Technology since 1968."

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Meshkati's real world experience and scientific expertise. Dr. Meshkati was always very responsive and actively engaged with our team, which is so important to the success of this type of advisory work. He is one of the most effective and thoughtful Steering Committee members I've had the pleasure of working with.

For these reasons, I would like to eagerly endorse the appointment of Dr. Najmedin Meshkati to the Diablo Canyon Independent Safety Committee.

Warmest Regards,

Sarah E. Brady

Sarah Brady
Interim CEO of the California Council on Science and Technology

HUMAN FACTORS and ERGONOMICS SOCIETY

February 6, 2024

Mr. David Zizmor
Public Utilities Regulatory Analyst
California Public Utilities Commission – Energy Division
505 Van Ness Avenue
San Francisco, CA 94102
Via Email: DAVID.ZIZMOR@CPUC.CA.GOV

Re: Nomination of Dr. Najmedin Meshkati for the Diablo Canyon Independent Safety Committee

Dear Mr. Zizmor:

On behalf of the Human Factors and Ergonomics Society (HFES), we strongly support the nomination of Dr. Najmedin Meshkati, Professor of Civil and Environmental Engineering, Industrial Systems Engineering, and International Relations at the University of Southern California (USC) for the Diablo Canyon Independent Safety Committee (DCISC).

HFES enthusiastically supports the nomination of Dr. Meshkati for appointment to the DCISC because of his extensive expertise in the safety, reliability, and efficiency of complex, large-scale systems, particularly with respect to human factors and safety culture which HFES believes to be critical to the continued successful use of nuclear power. As you know, a neglect of human factors design principles and safety culture problems were behind major nuclear power accidents at Three Mile Island and Chernobyl. Paying close attention to these factors should form a critical part of any successful safety review.

Dr. Meshkati provides a unique perspective that would greatly benefit the DCISC by providing an interdisciplinary, human-system oriented approach to the safety of Diablo Canyon NPP. Dr. Meshkati would serve as an indispensable resource to ensure that human factors and safety culture concerns are being sufficiently considered by DCISC.

For the past 39-years, Dr. Meshkati's research has focused on risk reduction and reliability enhancement of complex socio-technological systems, including nuclear safety. Dr. Meshkati's expertise in this area is widely recognized. He was a Research Fellow (and now an "Associate") with the Project on Managing the Atom at the Belfer Center for Science and International Affairs at the Harvard University Kennedy School. He has developed and taught two graduate courses on nuclear safety at USC: "Nuclear Safety and Security: Human Performance and Safety Culture" and "Complex Systems Safety and Resiliency: Safety Culture, Systems Design & Integration."

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202/367-1114 • Fax 202/367-2114
Email: info@hfes.org Web site: http://www.hfes.org

Dr. Meshkati is a member and Fellow of the Human Factors and Ergonomics Society (HFES). HFES is the world's largest scientific association for human factors and ergonomics (HF/E) professionals, with more than 3,000 members globally. Following the Three Mile Island accident in 1979, HFES reviewed a number of nuclear plant control rooms and published an extensive report, which became a seminal source for nuclear safety. HFES strongly supports an interdisciplinary orientation to nuclear safety for this position and urges the CPUC and DCISC to include a Human Factors expert on this committee.

Thank you for the opportunity to support Dr. Meshkati – HFES strongly supports his nomination for appointment to the Diablo Canyon Independent Safety Committee. Dr. Meshkati possesses the expertise and experience needed to make strong contributions to this committee's work. We believe he is uniquely qualified for the position and encourage you to give due consideration to his nomination.

Sincerely,

Susan Kotowski

Susan E. Kotowski, PhD, CPE, FAIHA
President
Human Factors and Ergonomics Society

To: David Zizmor, Esq.

From: Bill Hoyle

Re: support for appointment of Dr. Meshkati

Date: February 9, 2024

Dear David Zismor, Esq.

I strongly recommend the appointment of Dr. Najmedin Meshkati to the Diablo Canyon Independent Safety Committee for a 3-year term beginning July 1, 2024.

I worked closely with Dr. Meshkati for more than 20 years on the most complex safety investigations conducted by the U.S. Chemical Safety Board, CSB. CSB is an independent federal agency modeled after the highly-regarded National Transportation Safety Board. CSB in a scientific, non-regulatory agency that conducts studies and investigations of major accidents involving hazardous materials.

Dr. Meshkati is nationally-recognized expert on human factors, safety culture, high reliability organizations and the safe operations of nuclear power plants. He has extensive experience serving on safety committees of the prestigious National Academy of Sciences. He has won numerous awards for his contributions to improving safety.

Dr. Meshkati will be an invaluable addition to the Diablo Canyon Independent Safety Committee.

sincerely yours,

Bill Hoyle

Bill Hoyle
Manager and Senior Investigator, U.S. Chemical Safety Board, retired

WOMEN'S ENERGY MATTERS

April 4, 2024

Delivered by E-mail

Mr. David Zizmor
California Public Utilities Commission
505 Van Ness Ave.
San Francisco, CA 94102
david.zizmor@cpuc.ca.gov

Re: Public Comment Supporting Candidacy of Dr. Najmedin Meshkati for Appointment to Diablo Canyon Independent Safety Committee

Dear Mr. Zizmor:

Women's Energy Matters (WEM) writes in support of the candidacy of Dr. Najmedin Meshkati for appointment to the Diablo Canyon Independent Safety Committee (DCISC).

WEM is a non profit advocacy group that has participated in CPUC proceedings related to Diablo Canyon Nuclear Power Plant for many years. Most recently, WEM has been a party to R2301007, the CPUC's SB846 implementation rulemaking, providing evidence challenging state agency assertions that extended operations of Diablo Canyon are needed to assure grid reliability. WEM has also been a party to PG&E's NDCTP proceedings, addressing Diablo Canyon decommissioning issues. As WEM's Executive Director, I regularly attend DCISC meetings via SLO-SPAN. I am familiar with the DCISC's work product and the scope of issues the Committee addresses.

Dr. Meshkati is a tenured professor of Civil/Environmental Engineering, Industrial and Systems Engineering, and International Relations at the University of Southern California. His work addresses risk reduction and reliability enhancement of complex technological systems. He has a strong background in nuclear power plant safety issues, including service as a member/technical advisor to the National Academy of Science/ National Research Council's Committee, "Lessons Learned from the Fukushima Nuclear Accident for Improving Safety and Security of U.S. Nuclear Plants."

Dr. Meshkati's expertise includes a focus on human factors and safety culture in complex industrial settings. His work on nuclear safety has been published in professional journals and national/international press. Notably, Dr. Meshkati called out the safety culture at San Onofre Nuclear Generating Station (SONGS) in an April 2011 *LA Times* Opinion piece,

Dr. Meshkati has the professional experience and stature to integrate with current DCISC members and staff, while bringing valuable new perspective to the Committee's consideration of safety challenges related to extended operations, nuclear waste storage, and plant decommissioning. WEM strongly recommends that the President of the CPUC select Dr. Najmedin Meshkati to be a candidate for appointment, and that the Chair of the CEC appoint Dr. Meshkati for the term beginning July 1, 2024.

Sincerely,

Jean Merrigan, Executive Director
Women's Energy Matters
P. O. Box 2615
Martinez, CA 94553
(925) 957-6070
jnmwem@gmail.com

To the attention of: David Zizmor, Esq.
Public Utilities Regulatory Analyst
California Public Utilities Commission – Energy Division

Dear Mr. Zizmor:

I wish to endorse the candidacy of Dr. Najmedin Meshkati for the Diablo Canyon Independent Safety Committee (DCISC) 3-year term beginning July 1, 2024.

It is a pleasure and privilege to enthusiastically endorse the candidacy of Dr. Meshkati. As evidenced by his professional credentials and accomplishments Dr. Meshkati is an internationally respected authority in the field of risk reduction in complex technological systems. While his expertise spans a broad spectrum of technical and scientific endeavors, including health care, I know Dr. Meshkati best from his many years of contributions in the field of nuclear energy.

For context, before retirement I worked for four decades in nuclear power including commercial nuclear power plants, the Institute of Nuclear Power Operations, and the U.S. Department of Energy (DOE) including special assignments with the International Atomic Energy Agency. My primary role was as a specialist in human and organizational factors for safe nuclear operations. In the 1980's I conducted safety inspections at Diablo Canyon, and served as a consultant for the restart of Rancho Seco and subsequently for the safe closure of that plant. In retirement I serve as consulting advisor for DOE and IAEA.

I have had the pleasure of knowing Dr. Meshkati personally and professionally for two decades. The state of California has been home for him and his family for some 40 years. During that time, he has distinguished himself and his beloved University nationally and internationally acquiring multi-discipline expertise of technical, human/organizational factors and governmental scientific policy that set him apart as unique in his scholarly and applied fields of knowledge.

From my professional experience I appreciate that the scope of DCISC responsibilities in the future will require expertise far beyond the typical (though substantial) technical knowledge and experience of nuclear power plant operations. The decisions to cease power operations at Diablo Canyon placed the plant on a complicated trajectory toward shutdown. The recent decisions and actions to continue operations of the plant supportive of grid reliability and energy de-carbonization introduce levels of

complexity requiring unique skill and knowledge beyond the considerable requirements of normal nuclear operations.

Oversight bodies for operating nuclear plants often focus on technical issues of engineering, maintenance and work control. Alterations of operating tempos pose additional concerns of workforce stability, skill and knowledge retention, governance, budget stabilities, as well as organizational, human performance, culture and institutional support.

For example, the history of nuclear plant closures demonstrates that as plant approaches shut down the workforce begins to change significantly. Often the most capable professionals seek employment elsewhere, and those of longest tenure with irreplaceable historical knowledge find it in their personal interest to retire. The collective knowledge and working relationships of management, technical workforce, and regulatory bodies that support reliability become vulnerable and specialized attention to these factors is required. This is most likely a key issue for Diablo Canyon continued operations.

The foundational knowledge of engineering, defense in depth and essential safety functions remains always necessary, yet it is no longer sufficient. Attention to Resilience is now foremost in strategic approaches of national and international nuclear leadership. The focus on resilience is about how operating organizations, regulators and oversight bodies adapt and respond under conditions of uncertainty to meet the electrical energy needs of the public they serve (the COVID19 pandemic and the Fukushima nuclear disaster are vivid examples). The extent of focus on resilience is illustrated by the International Atomic Energy Agency expert committee Strengthening Human and Organizational Resilience in Nuclear Organizations that is drafting guidance on developing and sustaining resilient capacities. In 2022 resilience was theme of annual Institute of Nuclear Power Operations CEO Conference. Remarks by the chair of the Nuclear Regulatory Commission at that conference highlight key challenges requiring competence:

> "I think after the events of the last two and a half years, we should all be looking closely at the concept of resilience. Because one of the key lessons of the pandemic for me is that highly optimized systems are not always very resilient... Resilience isn't focusing on a few things here or there, it is seeing the entire field and making informed decisions based on that wider perspective. a range of possible futures. As we evaluate those futures, we have to incorporate internal

> factors like workforce structure, rulemakings, processes and procedures. But we also have to incorporate external factors like industry and market dynamics, climate change, and public sentiment."

The knowledge base of nuclear technology and operations is sound, yet continues (as it must) to evolve. There is a growing documented knowledge base of resilience challenges, and sound knowledge of technical processes; however knowledge related to the human, organizational and institutional factors that support resilience is more rare. It is in this particular arena that Dr. Meshkati stands apart from the other distinguished potential candidates whose expertise focuses on the technical.

In February of 2022 Dr. Meshkati was selected as one of the "Titans" of the Human Factors and Ergonomics Society (HFES). HFES is the world's largest scientific association for human factors/ergonomics professionals. Previously in 2015 HFES presented to Dr. Meshkati the society's highest honor, the Arnold M. Small President's Distinguished Service Award, for his "career-long contributions that have brought honor to the profession and the society." Dr. Meshkati's investigations, analyses and scholarship about the human, organizational and safety culture factors associated with server accidents, such a Fukushima nuclear plant disaster in Japan, are well known and admired. Recently he was asked to comment on the dangers associated with the Russian invasion of Ukraine and seizure of the Zaporizhzhya nuclear plant. His astute commentary focused on the human factors as the most concerning and most vunerable aspect of that atrocity; recognizing that human operators and workers always constitute society's first and last layer of defense. Returning to the more local focus on California and Diablo Canyon, the research of Dr. Meshkati and his students on the role of "Leadership Safety Values and Actions" in the history of Pacific Gas and Electric management is further illustration of his ability to discern causal factors beyond the technical, often tracing responsibility beyond technical and worker 'error' to allocate, when appropriate, fundamental accountability to those who wield authority and budgets to the disservice of the public.

Dr. Meshkati's technical and professional qualifications for selection to the DCISC are unassailable. Beyond that, he is known by his colleagues as a consummate professional; dedicated to the integrity of his profession; dedicated to the education of future leaders of science, technology, industry and government; dedicated to the safety and well-being of the United States and all peace-loving nations; and dedicated to the safety and well-being of the people of his beloved home state of California.

With gratitude to the Commission for the opportunity to comment on this vitally important appointment, it is an honor and distinct privilege to endorse and recommend selection of Dr. Najmedin Meshkati as a member of the Diablo Canyon Independent Safety Committee.

Respectfully,

W.E. Carnes
former Senior Advisor, U.S. DOE (retired)
Hagerstown, MD

ALLIANCE FOR NUCLEAR RESPONSIBILITY

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(805) 704-1810
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April 4, 2024

David Zizmor
California Public Utilities Commission
505 Van Ness Avenue
Energy Division, Fourth Floor
San Francisco, CA 94102

Via email: david.zizmor@cpuc.ca.gov

Re: Diablo Canyon Independent Safety Committee
Appointment of Dr. Michael Quinn—SUPPORT

Dear Mr. Zizmor:

The Alliance for Nuclear Responsibility would like to support the nomination of Dr. Michael Quinn to the Diablo Canyon Independent Safety Committee (DCISC) as the appointee of the Chairman of the California Energy Commission.

The Alliance's mission includes monitoring ratepayer investments to improve safety and mitigate environmental damage from the operation of the state's last aging reactor. The DCISC is charged with monitoring safety oversight at Diablo Canyon. However, as their charter is a creation of the CPUC, no less an obligation should be their consideration of ratepayer impacts—and safety comes with a price tag—one that PG&E should not be short-changing to enhance its own bottom line.

These oversight concerns grow more pressing as PG&E is once again applying for a 20-year license renewal from the NRC:

- How and who will monitor PG&E's lapsed maintenance and review the appropriate level of capital improvement needed for the remaining years of operation?
- How and who will monitor the NRC's oversight with regards to waivers that may or may not be issued for repairs and seismic upgrades, given the shortened relicensing application window?
- Who will ensure that the workplace behavior conditions noted in recent NRC reports outlining concerns with problem identification and resolution at Diablo Canyon?

1

The current DCISC members have been in place for over nearly two decades. Regrettably, collegiality has given way to complacency. One recent example came to light during the September 2023 meeting of the DCISC. PG&E presented a plan for an emergency dredging project of the intake coves to alleviate silt accumulations that could encumber the flow for the primary heat sink. As the DCISC consultant Rick McWhorter put it:

> During our reviews of maintenance, we did run across one item on the project list that was called Intake Cove Sediment Removal, and we basically said, "Oh, what's that about? We haven't heard about that before." **And this is an issue that has been around for a while, we've learned, we just had not heard about it**. [emphasis added]

How could the DCISC have not investigated this, as PG&E later revealed it had been in process since January 2023? Given their bi-monthly fact-finding visits to the facility, which often include walk-downs of the intake coves, how could they have been unaware of this?

With no incumbent candidate for the current opening, it is now possible to have fresh eyes examining an increasingly geriatric and frail patient. For as Section 8 of SB 846 reminds us:

> …the commission created the Independent Committee for Diablo Canyon to make recommendations appropriate **to enhance the safety** of the operation of the Diablo Canyon powerplant… [i]ncluding annually transmitting its findings and recommendations for **improved safety** [emphasis added]

The words "enhance" and "improve" indicate that *status quo* is <u>not</u> good enough; they are action verbs that require forward thinking and pro-active measures to be sought and implemented. "Checking the box" and declaring that all is well—the current *modus operandi* of the DCISC—falls short of these SB 846 requirements.

That is why the Alliance welcomes the candidacy of Dr. Quinn to the DCISC. Today, faced with the dual issues of attempted NRC license renewal *and* proceeding with the decommissioning process, only his resume´ indicates specialized training and experience in both areas of concern.

While it is true that all the candidates show strong histories with nuclear science and regulation, their careers are also largely academic. Dr. Quinn's resume stands out for its emphasis on the *practical*. He has <u>actual plant operation experience</u> having held an NRC licensed Senior Reactor Operator credential. As his CV also notes,

- Member of a team that conducted a several month Reliability Assessment of Vermont Yankee for the State of VT: Lead assessor of the Root Cause process within the Corrective Action Program evaluation, **for feasibility of plant license extension beyond the 40-year license** [emphasis added]

This qualification is especially valuable as PG&E (and the state) finds itself at the same point as Vermont did—and with the same need for oversight and review sought by the state of California under SB 846—in this process for extending Diablo's operating life.

Of the current candidates, Dr. Quinn's recognition of Diablo's changing status is unique, and we believe a valuable insight into his thought process and expertise.

The human performance aspects of nuclear power operations are likely to be looming as large as the technical considerations in these next few years. The experiences of a candidate such as Dr. Quinn in identifying and working to mitigate any shortcomings that could impact reactor operations and public safety would be welcomed by ratepayers and stakeholders alike.

As well, Dr. Quinn's tenure at nuclear plants in Connecticut includes the time in which those facilities transitioned from operation to decommissioning. As Diablo's decommissioning is inevitable—and accelerated if the bid to relicense the plant is halted—his experiences will be valuable; those are not found in the CVs of the other candidates.

The Alliance for Nuclear Responsibility endorses Dr. Michael Quinn for appointment to the Diablo Canyon Independent Safety Committee.

Yours truly.

/s/

DAVID WEISMAN
Executive Director
Alliance for Nuclear Responsibility

SIERRA CLUB
SANTA LUCIA

David Zizmor
California Public Utilities Commission
505 Van Ness Avenue
Energy Division, Fourth Floor
San Francisco, CA 94102

April 2, 2024

Via email: david.zizmor@cpuc.ca.gov

Re: Diablo Canyon Independent Safety Committee
Appointment of Dr. Michael Quinn—SUPPORT

Dear Mr. Zizmor:

The Santa Lucia Chapter of the Sierra Club wholeheartedly supports the nomination of Dr. Michael Quinn to the Diablo Canyon Independent Safety Committee (DCISC) as the appointee of the Chairman of the California Energy Commission.

The Santa Lucia Chapter represents over 2,000 Sierra Club members and supporters who live and work in San Luis Obispo County and are directly impacted by the operations of Diablo Canyon Nuclear Power Plant (DCNPP).

The Diablo Canyon Independent Safety Committee (DCISC) is facing a particularly challenging phase in the operations of DCNPP. Pursuant to a 2016 agreement to decommission the Plant, PG&E management shifted into a phased preparation of winding down operations and processes in preparation of a scheduled full decommissioning in 2024, the expiration of its licenses. At this time PG&E is straddling two separate and fully incompatible courses of action: advancing plans with the County of San Luis Obispo for a permit to decommission the plant and a pathway under SB 846 to continue operation of the Plant until 2030 and potentially a full 20-year extension of its operating license. Each pathway present challenging and critically important decisions regarding maintenance, upgrades, repairs, operations, and structural assessments of the Plant.

The Santa Lucia Chapter of the Sierra Club and the residents of San Luis Obispo County have a long history of thoughtful, informed advocacy to demand the safest possible operations of the Plant. The DCISC holds the position as the singular independent source for the community for oversight of safety and operations. Without DCISC, DCNPP could become a complete black box to the community. The appointment of a new member of the DCISC holds special importance for the community.

In a recent letter to the San Luis Obispo County Board of Supervisors, the Santa Lucia Chapter focused on community concerns specifically related to the potential for unsafe embrittlement of the Unit 1 reactor. On March 20, 2024, Mothers for Peace and Friends of the Earth submitted a brief to the Ninth Circuit Court directed at the embrittlement issue. The Brief provides an instructive history of embrittlement analysis for DCNPP's Unit One pressure vessel. From the Brief:

> Case No. 23-3884 IN THE UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT SAN LUIS OBISPO MOTHERS FOR PEACE, INC. AND FRIENDS OF THE EARTH, INC. Petitioners, v. UNITED STATES NUCLEAR REGULATORY COMMISSION[1]
>
> ...since 2021, the NRC has allowed PG&E to operate Diablo Canyon Unit 1 in violation of the 2006 license condition on which the extended operating license term for Unit 1 is founded. And despite the importance of the Unit 1 pressure vessel to the safety of the reactor's operation, the required 2009 *inspection of the pressure vessel has been delayed by more than fourteen years*. All of this has been done without a meaningful opportunity for public input. (P 8)
>
> ...the NRC issued a low-power license for the sole purpose of testing the reactor. After three years of low-power testing, the NRC issued PG&E a full-power operating license for Unit 1 on November 2, 1984. The license allowed PG&E to operate Unit 1 for forty years from the date of issuance of the construction permit, or until April 23, 2008. 2-ER-251. (P 9)
>
> With respect to public health and safety, PG&E has now operated Unit 1 for more than twenty years without withdrawing any capsule from the Unit 1 pressure vessel. And as discussed in Section D.2 above, PG&E has no data from the most recently withdrawn capsule – Capsule V in 2003 – that it considers credible. Further, given that the NRC has now dubbed Capsule B a "standby" capsule, it appears unlikely that Capsule B will be withdrawn any time soon. (P 35)

The unique status of DCNPP – will it or won't it continue operations and if so for how long – is a paramount concern for the public. It is therefore extremely important that an appointment to the DCISC have exceptional experience and a history of involvement in nuclear site safety management systems' performance and the trust of the public.

Dr. Michael Quinn offers an exemplary career well suited to the particular challenges of oversight of DCNPP. He demonstrates a history of extensive direct experience with overseeing nuclear safety management systems' performance at over 40 nuclear units in the in the U.S. and Canada.

From Dr. Quinn's CV:

> What Dr. Quinn can bring to the DCISC:
> Upon appointment Dr. Quinn expects to bring a current and comprehensive nuclear operations assessment body of work experience to the Committee. Additionally, his firsthand experience assessing significant challenges that have impacted nuclear facilities scheduled for

[1] https://mothersforpeace.org/wp-content/uploads/2024/03/2024.03.20-Pets-Opening-Brief-no-addendum.pdf

shutdown . . . while still safely operating to the final "breaker opening." This assessment experience applies to Diablo Canyon in the context of a permanent shutdown at some point:
-Assessing factors for maintaining Operational Excellence prior to permanent shutdown
-Assessing factors that maintain (or indicate decline in) conduct of operations focus on and fidelity to plant systems, structures, and components; as well as to procedure, program, policy, and license requirements
-Assessing extent to which the organization maintains the expected performance level of the cross-cutting areas: Safety Culture, Human Performance, and PI&R, as the station approaches permanent shutdown Closing.

The Santa Lucia Chapter of the Sierra Club fully endorses the appointment of Dr. Michael Quin to the Diablo Canyon Independent Safety Committee.

Respectfully,

Mila Vujovich-LeBarre, Chair
Executive Committee
Santa Lucia Chapter, Sierra Club

Performance Management Initiatives, Inc.
Richard N. Swanson
President
720 S. Greenbrook Circle
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voice: (269) 428-7447
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email: RNS@pmi-inc.com

March 05, 2024

California Public Utilities Commission, Energy Division
505 Van Ness Avenue
San Francisco, CA 94102-3298

Attn: Mr. David Zizmor

Subj: Nomination of Dr. M. D. Quinn for membership on the Diablo Canyon Independent Safety Committee

Dear Mr. Zizmor:

I am writing in support of Dr. Michael D. Quinn's candidacy for a position on the Diablo Canyon Independent Safety Committee. I have known Dr. Quinn for approximately 18 years and have worked closely with him on several analytical assignments associated with nuclear safety performance at US nuclear power plants.

In my considered professional opinion, Dr. Quinn is well-suited to be a member of an Independent Safety Committee for a nuclear plant by virtue of his professional credentials, his education, his work experience, his impeccable work ethic, and his scrupulous ethics. I highly recommend him.

Credentials include: Senior Reactor Operator License #10071; certification as a Radiation Safety Officer; certification as a Root Cause Investigator; certification to conduct Behavioral Interviews.

Educational achievements include: Doctor of Science (Sc.D.) in Organizational Management Systems; Masters of Business Administration (MBA); and Bachelor of Science (B.S.) in Chemistry; as well as numerous technical training courses related to the nuclear industry such as Emergency Planning, welding, Emergency Response Assessment, nuclear operations, and radiation protection.

His **work experience** includes over 45 years in the nuclear industry in positions such as: Chairman of the Plant Operations Review Committee; Chairman of the Corrective Actions Review Board; member of a Nuclear Safety Assessment committee; Nuclear Refueling and Maintenance Outage Manager; Chemistry Manager; Project Manager; Director of Station Emergency Operations; Director of Station Services; Radio-Chemist and Manager of Planning and Operational Standards. He has been a senior level consultant for the past 24 years, providing services that include: event investigation/Root Cause Evaluation; Safety Culture evaluations; nuclear program and reliability assessments; recovery plans for deficient safety cultures; Corrective Action

Program diagnostics and remedial actions. Virtually all of his consulting assignments involve interacting with and reporting results to senior utility executives.

Dr. Quinn conducts both his professional and personal life on the basis of **scrupulous ethics**. His technical and managerial work products, and his behavior, meet the highest standards of integrity. He verifies his facts and data before reaching conclusions and makes extensive use of "peer checks" and "independent verification." He is able to explain the detailed basis for every conclusion and finding of fact he produces. He takes his responsibility to support nuclear safety very seriously and demonstrates his commitment through exemplary professional behavior at all times. If he does not know the answer to a question, he says so—and then finds out. If he is provided with additional facts he had not previously considered, he reconsiders his conclusions based on both the old and new information. He is not only "truthful" ('tells the truth'), he is also "honest" ('tells the entire set of relevant facts and the context in which they apply'). I have personally observed on several occasions that, when justified by his observations, his feedback to individuals in senior positions includes "tough" messages regarding substandard performance and less than adequate personal executive involvement.

I have been a senior manager at several nuclear plants in the course of my 52-year career, and have managed several departments, including Engineering, Quality Assurance, Regulatory Affairs, and Construction. When it comes to describing the individual I would most value to independently assess my areas of responsibility and tell me the painful reality regarding what I really need to know about my organization, Dr. Quinn is the exemplar.

Dr. Quinn is one of only six individuals with whom I am willing to team on consulting assignments—he meets my standards for integrity, persistence, reliability, broad-based knowledge, and 'internalized curiosity.'

I highly recommend him. If you would like to further discuss my personal observations of Dr. Quinn's performance, I would be honored to do so.

Sincerely,

Richard N. Swanson, P.E. (Retired)

Matthew W. Sunseri
11495 FM 1486 Rd.
Richards, Texas 77873

March 6, 2024

David Zizmor, Esq.
Public Utilities Regulatory Analyst
California Public Utilities Commission – Energy Division
505 Van Ness Avenue
San Francisco, CA 94102
(415) 703-1575

2024 Nomination of Dr. Michael D. Quinn, Diablo Canyon Independent Safety Committee (DCISC)

Dear Mr. Zizmor,

I am Matthew Sunseri, a nuclear industry professional for over 40 years. I have served as president and chief nuclear officer at a commercial nuclear operating company in the US before retiring. As an industry consultant currently, I serve as chairman of an independent safety board for a nuclear facility in Canada, and I also am a member and former chair of a statutory required governmental safety committee in the US. I am writing to you not in those official capacities but as an individual member of the public.

I have known Dr. Quinn for quite a long time, am familiar with his work and worked with him on a project. He would be an excellent contributor as a member of the DCISC for the following reasons.

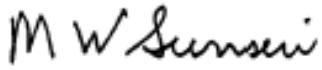
Dr. Quinn has twenty-five years of nuclear power plant experience. I have observed in my career that highly effective safety oversight individuals all possess a common factor. They understand the business and technology that they are reviewing. Dr. Quinn's experience positions him to provide excellent oversight of an operating nuclear power facility such as Diablo Canyon.

Dr. Quinn has twenty years of consulting experience primarily in event and organization analysis. This experience enables Quinn to know how to ask the right questions at the right time in order to make the most effective use of the committee's precious time at the operating facility. The fact that Dr. Quinn also teaches analysis techniques demonstrates his proficiency with these skills.

Dr. Quinn has served as a board member and chairman of a local community not-for-profit board. In this service, Dr. Quinn demonstrated his ability to create a safe environment for discourse, to achieve consensus among the members and to produce results. I expect that these skills will enable Dr. Quinn to work very effectively with the three member DCISC.

In closing, Dr. Michael D. Quinn possess the background, skills and abilities to be an effective member of the DCISC, and I highly support his nomination.

Sincerely,



Matthew W. Sunseri

Rear Admiral Michael T. Coyle, U.S. Navy (Ret)
2361 E. Gossamer Lane
Boise, Idaho 83706
Mtcoyle1943@gmail.com

David Zizmor, Esq.
Public Utilities Regulatory Analyst
California Public Utilities Commission – Energy Division
505 Van Ness Avenue
San Francisco, CA 94102

Dear Mr. Zizmor,

I am writing you on behalf of Dr. Michael Quinn, a candidate for appointment to the Diablo Canyon Independent Safety Committee. I have worked with Dr. Quinn on a number of nuclear safety assessments at government facilities. His competence and professionalism as a team leader has been impressive. His insights are exceptional. His ability to focus on getting to the root of safety issues in a effective manner is outstanding. In my nearly sixty years of nuclear experience in Navy, commercial nuclear, and Energy Department organizations, including as a member of the Duane Arnold Nuclear Plant Off-Site Safety Committee, I consider Mike as one of the best. I believe that he will make a valuable contribution to the Diablo Canyon Independent Safety Committee and highly recommend his selection.

Thank you.

Sincerely,

Michael T Coyle

Dr. Rachel N. Slaybaugh
DCVC
270 University Ave
Palo Alto, California 94301

Partner
Phone: +1 415-841-3935
Email: rachel.slaybaugh@dcvc.com

April 24, 2024

Dear Diablo Canyon Independent Safety Committee Selection Committee,

I highly recommend Professor Raluca Scarlat for the Independent Safety Committee (ISC) for the Diablo Canyon nuclear power station. Dr. Scarlat would bring a wealth of safety and safety management experience, deep technical knowledge of nuclear reactors, a strong sense of ethics, and commitment to doing the job well.

I have known Dr. Scarlat since 2014 when I joined the Nuclear Engineering (NE) faculty at the University of California, Berkeley (UCB) and she was a postdoctoral scholar in the same department. Since then, I have tracked her career closely and we become colleagues when she joined the NE department at UCB in 2019. When I left UCB, Prof. Scarlat took over mentoring one of my graduate students, and I remain in touch with Prof. Scarlat. I am at least reasonably familiar with her research, approach to mentoring, demeanor in meetings, general professional conduct, etc.

Prof. Scarlat also has a broad range of first-hand experiences in ensuring safety and training personnel to ensure safety. Professor Scarlat is a Nuclear Engineering professor at UCB where she operates laboratories that involve handling of beryllium and radioactive isotopes. In any given semester, 20-30 students and researchers are training in her laboratories, learning to perform research, and learning to safely operate the experimental facilities in which beryllium and radioactive materials are handled. There are only a handful of laboratories around the world that have such capability to work with high temperature molten salts that contain both beryllium and uranium and irradiated materials. Beryllium is a respiratory hazard that must be carefully controlled (< 0.2 micrograms per m^3), and administrative controls in any beryllium laboratory are extensive. Training students not only to operate in such laboratories, but to run and take ownership for the safe operation of the beryllium laboratory is something that Prof. Scarlat does exceptionally well.

In addition, Dr. Scarlat has expertise in nuclear thermal-hydraulics, reactor safety, materials and corrosion, and plant operation. Her research experience and deep knowledge in these areas give her a robust understanding of how nuclear reactors work and how they need to operate safely.

Professor Scarlat also engages in the sociotechnical dimensions of nuclear energy and takes a critical and measured stance on how risks are managed and communicated. Her work teaching engineering ethics helps demonstrate her commitment to how and why nuclear energy must be safely and responsibly managed.

I believe that Prof. Scarlat would be an exceptional member on the ISC for Diablo Canyon. I expect she would be thorough in her critical review and highly effective at working with the rest of the members of the ISC. Prof. Scarlat's voice would be a valuable contribution; she stands her

ground and makes sure her and anyone else's questions are answered. I strongly support Prof. Scarlat's application for the Diablo Canyon Independent Safety Committee, and I cannot think of a more qualified candidate to serve as a knowledgeable and critical reviewer of plant safety.

Sincerely,

Rachel Slaybaugh

P.S. I thought it might make sense to tell you my background, so you know why a letter of reference from me makes sense. I have a BS in Nuclear Engineering from Pennsylvania State University, where I was a licensed research reactor operator, and a MS and PhD in Nuclear Engineering and Engineering Physics from University of Wisconsin—Madison. I was a Senior Engineer at Bettis Atomic Power Laboratory (now Naval Nuclear Lab) 2012-2014 where I did shield design and taught shielding and also served as an Adjunct Professor at University of Pittsburgh. I was an Assistant and then Associate Professor of Nuclear Engineering at UC Berkeley 2014-2021. While I was a professor, I founded the Nuclear Innovation Bootcamp, served as a Program Director at the Dept. of Energy (DOE) Advanced Research Projects Agency Energy (ARPA-E) where I started the fission program, co-founded the Good Energy Collective, served on the Biden-Harris DOE Transition Team, and was a Division Director at Lawrence Berkeley National Lab where I served as the Cyclotron Road Division Director. I also served on the Nuclear Energy Advisory Committee for DOE, held many leadership positions in the American Nuclear Society, and was a member of the National Academies of Sciences Study on Laying the Foundation for New and Advanced Nuclear Reactors in the US. Now, I am a Partner at DCVC, a deep tech venture capital firm, where I lead our climate investment practice. DCVC has invested in three fission, one fusion, and one nuclear battery company.

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

April 18, 2024

Mr. David Zizmor
Public Utilities Regulatory Analyst
California Public Utilities Commission – Energy Division
505 Van Ness Avenue
San Francisco, CA 94102

Dear Mr. Zizmor,

I am pleased to recommend Prof. Raluca Scarlat for membership on the Diablo Canyon Independent Safety Committee (DCISC). I have known Prof. Scarlat for over a decade, since she graduated from UC-Berkeley and became a faculty member at the UW-Madison, as well as in her present position as an Associate Professor at UC-Berkeley in Nuclear Engineering. She has become nationally known for her expertise in nuclear reactor safety and plant operation, with an emphasis in chemistry and corrosion. She has continued this emphasis into her current research at UC-Berkeley with a focus on materials interactions in extreme environments that are encountered in current Light Water Reactors (LWRs) as well as advanced small modular reactors (SMRs). For example, her research has enabled the innovative development of a wide range of inorganic liquids for use in a broad range of applications in nuclear reactor design and fuel cycles: e.g., the development of fluids for advanced molten salt systems.

On the national front, Prof. Scarlat is a member of the Department of Energy Nuclear Energy Advisory Committee (NEAC), which is the premier advisory body to the DOE in nuclear science and engineering. The NEAC advises the Assistant Secretary of Nuclear Energy in matters of research and development for LWR and advanced SMR technologies as well as provides technical and policy advice on the entire nuclear fuel cycle including spent fuel storage and disposition. More recently, she has been appointed as a member of the McClellan Nuclear Research Center Nuclear Safety Committee. This experience has given her a broad base of expertise in plant operations and safety issues that can be directly applicable to the Diablo Canyon nuclear plant.

Prof. Scarlat has expertise in policy matters that go beyond the technical aspects of nuclear power. Nuclear power relies on stable institutions, and on an independent regulator to ensure safe operation, maintenance and plant inspections. Social acceptance of nuclear power relies on risk communication and engagement with local communities, requiring transparency and enabling local communities to have a voice in how the risks to their community are managed and communicated. Prof. Scarlat, as part of her educational mission at UC-Berkeley, instills these principles in her students. She will also bring these principles to her work on the DCISC. In my opinion, she will be an excellent member of the Diablo Canyon safety committee. Please feel free to contact me if you any further questions.

Sincerely,

Michael L. Corradini, Wisconsin Distinguished Professor

Robert J. Budnitz
734 The Alameda
Berkeley CA 94707
home telephone (510)527-9775
email: budnitz @ pacbell.net

25 March 2024

Nominations
c/o David Zizmor, Energy Division, California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
david.zizmor@cpuc.ca.gov

SUBJECT: Letter in support of Dr. Raluca Scarlat for the DCISC

[Although I am currently a member of the Diablo Canyon Independent Safety Committee, this letter is being written by me personally and is not being sent in my official capacity as a DCISC member.]

I am writing this letter to support the appointment of Dr. Raluca Scarlat to the Diablo Canyon Independent Safety Committee (DCISC). I am currently a member of the DCISC and have been a member since mid-2007, when I was appointed to a 3-year term by then-Attorney General Brown. I was reappointed by AG Brown for another term in mid-2010, reappointed again in mid-2016 by Attorney General Harris, reappointed again in mid-2019 by AG Becerra, and again in 2022 by AG Bonta.

I am retired from UC's Lawrence Berkeley National Laboratory, and have spent the last several decades maintaining close contact with the UC-Berkeley Dept. of Nuclear Engineering and its faculty, staff, and students. That department had (and still has) a sister-to-sister relationship with my own pre-retirement group at LBNL. It is from that perspective that I can comment on Raluca Scarlat.

Dr. Scarlat's qualifications are exceptional. I have known her and watched her work mature for about 15 years, since just after she came to UC-Berkeley as a graduate student in nuclear engineering.

She would bring to the DCISC not only a lot of knowledge about nuclear power-plant safety, but also a personality marked by fierce independence and outstanding technical judgment.

It is often not easy to come up with an evaluation of the skills and promise in a sensible way for a person less than half one's age. But for Raluca it is very easy. Others have probably had the rare experience that I had, to wit: I recall meeting her when she was a graduate student, just starting to explore the world of advanced

engineering, and saying to myself something like, "*This one is going to be an all-star, no doubt about it.*" This doesn't happen very often, of course, but on rare occasions in my life it has! And Raluca Scarlat was the object of just such a reaction from the very first few times that I encountered her. She was insightful, thorough, inquisitive, creative, and a wonderful personality too, all in one. She was clearly going to turn out to be one of the best of her peer group, and that has in fact become true.

So when she finished her Ph.D. and left Berkeley, I recall saying to myself and others something like, "*Golly, what a loss. Maybe someday Berkeley can lure her back.*" And then, a few years later, Raluca was back in Berkeley! And now she's a tenured faculty member in the only remaining nuclear engineering department in the state of California. And it's a small department too, so she's clearly earned her status in the judgment of many many others.

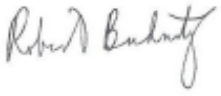
Raluca Scarlat has strong and broad knowledge of nuclear-reactor engineering, including the crucial aspects that involve how people interact with the machine and with the "system." She understands the materials-science side particularly well, but also how reactor design and reactor operations need to work together to achieve the desired safety level. She is strong in understanding radiation protection including radiation dosimetry, safety culture, how designs can be optimized to manage a rare evolving severe accident, and the role or regulations and regulatory agencies in helping achieve reactor safety.

Raluca has already been recognized by the broader community of experts, for example being asked to serve on the Dept. of Energy's Nuclear Energy Advisory Committee, one of the most prestigious advisory assignments in the US.

I believe that Raluca Scarlat has a good understanding of how a review committee like the DCISC can be most effective in carrying out its mission of helping to inform the State of California about the safety of the power plant at Diablo Canyon. And she is a genuinely nice person too!

Based on having known Raluca Scarlat since she was a graduate student, I believe her career has been exemplary. In my opinion, her appointment to the DCISC would be a great service to the citizens of California.

Sincerely,



[original signed by Robert J. Budnitz]

VIRGINIA TECH

Science, Technology, and Society
900 North Glebe Road
Virginia Tech Research Center
Arlington, VA 22203
P: (571) 858-3061
sschmid@vt.edu

Reference for Dr. Raluca Scarlat

Letter in support of Dr. Raluca Scarlat's application to the Diablo Canyon Nuclear Power Plant Independent Safety Committee

Falls Church, VA, April 26, 2024

To Whom it May Concern:

I am writing in support of Dr. Raluca Scarlat's application to the Diablo Canyon Nuclear Power Plant Independent Safety Committee. Dr. Scarlat is an accomplished nuclear scientist with a deep understanding for the social contract involved in the implementation of complex, high-risk technical systems such as a nuclear power plant. She combines technical aplomb with integrity, analytical brilliance with empathy, and excellent work ethics with collegiality.

Dr. Scarlat and I met in 2022 as appointed members of DOE's Nuclear Energy Advisory Committee (directly reporting to Assistant Secretary for Nuclear Energy Katy Huff). I am a tenured associate professor in the Department of Science, Technology, and Society (STS) at Virginia Tech, and co-direct the STS graduate program in Northern Virginia. Dr. Scarlat and I share a commitment to interdisciplinarity, an appreciation for social and historical factors in the nuclear field, and a passion for bringing together transformative research and socially responsible policy-making for the benefit of our global society.

Without rehashing Dr. Scarlat's extraordinary curriculum vitae, I'd like to highlight that UC Berkeley, where she earned her PhD, hired her back as a faculty member—something that happens rarely in academia, and that speaks directly to just how desirable her unique expertise is. Her teaching portfolio by far exceeds the traditional scope of a junior faculty member, both in terms of quantity, but also and especially in terms of quality. In terms of research, she directs graduate students and postdoctoral fellow in cutting-edge research on molten salts and high

temperature materials; many of her former students and colleagues at her lab are now faculty members or work at national laboratories.

At Berkeley's nuclear engineering department, Dr. Scarlat chairs the undergraduate curriculum committee, which has a direct impact on what kind of training future nuclear scientists and engineers receive at one of the premier departments in the country. Her leadership in the college of engineering as the chair of the Committee on Ethics and Social Responsibility further attests her commitment to a fair social contract when it comes to high-risk technologies such as nuclear power plants.

On the DOE's NEAC, Dr. Scarlat serves on two subcommittees: the subcommittee for the future nuclear workforce (which I chair), and the subcommittee for infrastructure (where infrastructure entails a strong, independent regulator, stable institutions, and community engagement at all stages of a project, including siting and decommissioning). Her commitment to transparency, to ethical engagement with communities and their (often negative) prior experiences with nuclear institutions, and to improving communication (to include listening, and consequently acting, to society's preferences) have made her stand out among her often more seasoned peers on that committee.

In sum, I cannot recommend Dr. Scarlat more highly for the DCISC. She brings deep knowledge and diverse experience in the field of nuclear safety to this group, as required by this position. What distinguishes her from the impressive slate of other candidates is her dedication to finding fair and equitable solutions to social problems surrounding nuclear energy. Her selection for the committee will provide a breath of fresh air, and a perspective that represents the views of younger generations—her students and peers. Given the polarized and entrenched debate associated with nuclear power writ large, and Diablo Canyon specifically, her contributions promise to be thoughtful, balanced, and respectful.

Please feel free to contact me with any additional questions.

Sincerely,

Sonja D. Schmid, Ph.D.
Associate Professor, Department of Science, Technology, and Society
Co-Director, Graduate Program in STS
Virginia Tech, Greater Washington, DC

UNIVERSITY OF CALIFORNIA, BERKELEY

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April 22, 2024

To Whom It May Concern,

Prof. Scarlat's extensive experience in the Department of Nuclear Engineering at the University of Wisconsin at Madison (2014-2019) and her subsequent tenure at the University of California at Berkeley (2018 – present) undeniably make her a highly qualified candidate for membership in the Diablo Canyon Independent Safety Committee (DCISC). Her experience has equipped her with a deep understanding of the nuclear engineering and nuclear chemistry fields. She has the necessary skills to contribute effectively to the committee's work, instilling confidence in her potential contributions.

Prof. Scarlat's expertise in nuclear engineering, focusing on materials chemistry and material failure, is unparalleled. Her understanding of the intricate physical, mechanical, and chemical processes that occur within reactor pressure vessels when exposed to high-energy (> 1 MeV) neutron radiation, leading to the embrittlement of the steel, is a unique perspective that would greatly benefit the DCISC.

Her current research emphasizes Generation IV molten salt reactors using eutectic mixtures of fluoride salts, such as FLIBE ($LiF\text{-}BeF_3$) and FLINAK (LIF-NaF-KF), as the heat transport medium. This has led Prof. Scarlat to explore deeply the interaction of these fluoride salt mixtures with carbon (graphite), which is used as a neutron moderator, and with the structural steels of the heat transport circuit. Thus, she would bring to the DCISC a materials chemistry perspective that is sorely needed on the committee. For example, the primary coolant in a Gen. II or III PWR is a Boric Acid [$B(OH)_3$]-Lithium Hydroxide (LiOH) aqueous-based system containing 1000-2000 ppm of B and 1 ppm of Li at start-up. Li is "bred" from the boron during fuel burnup via the reaction $^{10}B_5 + {}^1n_0 = {}^7Li_3 + {}^4He_2$, but the lithium concentration greatly affects the pH. Thus, the lithium concentration is controlled by ion exchange to control the pH. The close control of the chemistry of the coolant has been shown to prevent the cracking of internal components, such as core barrels, cold-worked stainless steel barrel bolts, primary-side cracking of steam generator tubes, and a host of other problems.

I bring this up because several years ago; I teamed with Prof. Walter Bogaerts and his student Kristol Dockx) of the University of Leuven on the analysis of hydrogen flakes in the RPVs of the Doel 3 and the Tihange 2 PWRs in Belgium. UT examination showed thousands of indications in the upper and lower shell plates that were many cm long in some cases. Electrobel (the plant operator) shut the two reactors down and examined the probable cause by making additional UT measurements. FANC (the Belgian "NRC") attributed the cracks to hydrogen uptake via the decomposition of water in a moist atmosphere during the hot forming of the steel ($Fe + H_2O = FeO + 2H_{abs}$), where the hydrogen is absorbed into the steel. As the steel cools, the absorbed atomic hydrogen recombines in voids, typically at MnS inclusions that are elongated in the rolling direction of the plate ($2H_{abs} \rightarrow H_2$) to generate a pressure that is added to the preexisting mechanical stresses (e.g., residual and operational) to increase the stress intensity factor at the periphery of the void significantly. If the stress intensity factor exceeds the fracture toughness of the steel, unstable crack growth may occur, leading to vessel failure under Pressurized Thermal Schock (PTS) conditions following a LOCA. While we agreed with FANC on the origin of the indications, our interpretation of the UT examinations convinced us that the number, density, and size of the indications were increasing with time, meaning that active cracks were present in the RPVs. Electrobel and FANC rejected our interpretation of the data because "there was no other source of hydrogen in the system"! The possibility of the existence of active cracks being present in the

1

RPVs never made it into the final report that was issued by ELECTROBEL because it contradicted the official narrative of FANC and ELECROBEL. They did not recognize the coolant was a hydrogen-based medium (water, H_2O) separated from the low alloy RPV steel by 7 mm of stainless steel! This laughable statement was made because it clearly showed the lack of any chemistry or electrochemistry expertise. The reactors were eventually shut down because Belgium decided to get out of the nuclear power business just as the supply of Russian natural gas was shut off. It seems that FANC and the Belgian parliament also lack economic expertise!

In 2007, Scarlat joined the University of California Berkeley for graduate studies in nuclear engineering to study the safety analysis of large complex systems and understand the role nuclear energy can play in energy portfolios. For her work as a teaching assistant in thermodynamics, she was recognized with the Outstanding Graduate Student Instructor in 2008. In 2009, Scarlat completed an M.S. in the Nuclear Engineering Department. She received a Certificate in Management of Technology from the Haas School of Business and was awarded an Excellence Award in Nuclear Energy Fuel Cycle R&D from the US Department of Energy in 2009, and a three-year Graduate Fellowship from Nuclear Engineering University Programs (NEUP) of the US Department of Energy. In the fall of 2011, after the Fukushima Dai-Ichi Nuclear Power Plant accident, Scarlat joined Hitachi GE in Ibaraki Prefecture, Japan, for an engineering internship to study severe accident progression at Fukushima Dai-Ichi Units 1 and 2 to make recommendations for improving severe accident management at the boiling water reactors. (BWRs) in Japan. In 2012, she completed her Ph.D. in Nuclear Engineering with Designated Emphasis in Energy Science and Technology. She continued research on advanced reactor licensing at UC Berkeley until 2014, when she joined as faculty at the University of Wisconsin Madison in the field of thermal-hydraulics and reactor safety.

Prof. Scarlat has co-authored 42 journal publications, 37 refereed conference proceedings, and a book chapter. Prof. Scarlat was awarded the American Nuclear Society (ANS) Mary Jane Oestmann Professional Women's Achievement Award in 2021. She has served as a working group member for the Development of ANS 20.2 Standard, "Nuclear Safety Design Criteria and Functional Performance Requirements for Liquid-Fuel Molten Salt Reactor Nuclear Power Plants.," and on the American Society of Mechanical Engineers (ASME) standards task group on graphite issues for Molten Salt Reactors (MSRs). Prof. Scarlat serves on the Nuclear Energy Advisory Committee (NEAC) for the US Department of Energy, Office of Nuclear Energy. She serves on the Nuclear Safety Committee and the Advisory Committee for UC Davis' McClellan Nuclear Research Reactors in Sacramento, CA.

I included the above incident in Belgium because I believe that the DCISC should display technical diversity by recognizing that nuclear technology is multifaceted and covers many disciplines, including nuclear physics, nucleonics, mechanical engineering, chemical and electrochemical science, and engineering, to name but a few of the more prominent disciplines. Prof. Scarlat would provide the DCISC with much-needed diversity with her background and skills in materials chemistry and electrochemistry.

Please do not hesitate to contact me if you need any additional input.

Sincerely Yours,

Professor Digby D. Macdonald, FRSNZ, FRSC, FNACE, FECS, FISE, FWIF, FASM, FIC, 1991 Carl Wagner Memorial Award (ECS), 1992 Willis Rodney Whitney Award (NACE International), 1993 W.B. Lewis Memorial Lecture (AECL) "for the development of nuclear power in the service of mankind", 2001 H. H. Uhlig Award (ECS), Electrochemical Society, 2003 U. R. Evans Award (UKCI), 2007 Khwarizmi Laureate in Fundamental Science, 2010 Lee Hsun Research Award (CAS), 2011 Doctuer Honoris Causa (INSA-Lyon), 2012 Faraday Memorial Trust Gold Medalist (SAEST), 2013 Gibbs Prize Awardee (IAPWS), 2014 Frumkin Memorial Medalist (ISE), 2012 Nominated for the 2024 Fermi Award for introducing electrochemistry into nuclear engineering, Distinguished Professor Emeritus, Department of Materials Science and Engineering, Pennsylvania State University. Professor in

Residence (Ret.), Departments of Materials Science and Engineering and Nuclear Engineering, University of California at Berkeley, Berkeley, CA 94720.

Berkeley
UNIVERSITY OF CALIFORNIA

Massimiliano Fratoni
Xenel Distinguished Professor and Chair
Department of Nuclear Engineering

4111 Etcheverry Hall
Berkeley, CA 94720-1730
510 664-9079
maxfratoni@berkeley.edu

April 23, 2024

To whom it may concern:

I am writing to support Prof. Raluca Scarlat's application for the Diablo Canyon Safety Committee.

Prof. Scarlat is an accomplished technical expert in molten salt chemistry and nuclear graphite, with 43 journal publications and overall 81 peer-reviewed publications.

Prof. Scarlat professional service and recognition is exceptional, as evidenced by the committees she has served on: McClellan Nuclear Research Center (MNRC) Nuclear Safety Committee (NSC), Jan 2024-present; McClellan Nuclear Research Center (MNRC) Advisory Committee, Feb. 2023-present; External advisory board member LIBRA ArpaE Project (MIT Plasma & Fusion Science Center) 2022-present; Working Group Member. ASME Standards task group on graphite issues for MSR. 2022-present; Nuclear Energy Advisory Committee (NEAC), US Department of Energy, Office of Nuclear Energy, 2022-present.; Working Group Member. Development of ANS 20.2 Standard, "Nuclear Safety Design Criteria and Functional Performance Requirements for Liquid-Fuel Molten Salt Reactor Nuclear Power Plants." 2020-2022.

Prof. Scarlat has demonstrated leadership through teaching and course development, research, and service. She teaches and has developed courses on the topics of: ethics, engineering and society, molten salt chemistry, nuclear fuel cycle, and thermodynamics. She has a total of 94 research advisees to date, including graduate, undergraduate, postdoc, researchers, visiting students and researchers, and thesis committees she served on, in the departments of nuclear engineering, material science and engineering, and chemistry. Prof. Scarlat serves in the capacity of head undergraduate advisor for the Nuclear Engineering department, has supported the student creation of the Fission Products peer mentoring program in the NE department at UC Berkeley, and chairs of the COE Ethics and Social Responsibility Committee for the college of engineering. She is the conference organizer for upcoming International Nuclear Graphite Expert Meeting (INGSM-2024). conference at UC Berkeley. She has been recognized by ANS with the Mary Jane Oestmann

Professional Women's Achievement Award in 2021, for her research and teaching contributions in the field of molten salt.

I believe Prof. Raluca Scarlat is an excellent candidate to serve on the Diablo Canyon Safety Committee.

Sincerely,

Massimiliano Fratoni