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IN THE UNITED STATES DISTRICT COURT FOR THE
DISTRICT OF UTAH, CENTRAL DIVISION

UNITED STATES OF AMERICA, Plaintiff, vs. RAPOWER-3, LLC, INTERNATIONAL AUTOMATED SYSTEMS, INC., LTB1, LLC, R. GREGORY SHEPARD, NELDON JOHNSON, and ROGER FREEBORN, Defendants.	Civil No. 2:15-cv-00828 DN **DECLARATION OF DR. THOMAS MANCINI** Chief Judge David Nuffer Magistrate Judge Evelyn J. Furse

I, Dr. Thomas Mancini, declare as follows:

1. I am over the age of 18 and competent to testify about the facts set forth in this declaration

Plaintiff Exhibit
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2. I am a consultant in the field of applied solar energy, specifically in the area of solar thermal power generation. For more than 35 years at Sandia National Laboratories and most recently as a private consultant, my technical efforts have focused on helping the solar industry develop cost-competitive, commercial solar thermal systems.
3. I have been retained by the United States to provide opinion testimony on various topics identified in my report[1] and in my deposition[2].
4. In response to the Defendants' motion to exclude my testimony at trial,[3] I provide this Declaration to supplement information in my report and deposition testimony. To the extent I discuss a topic in either my report or my deposition, I will not repeat the same information here except to provide limited context where needed.
5. At Sandia National Laboratories, in Albuquerque, New Mexico, my colleagues and I evaluated proposed solar energy technology created by private industry, and opined on 1) whether the proposed technology would work and, if so, 2) how to maximize its performance and minimize its costs.
6. Typically, a client from a private industry entity developing solar energy technology would bring to Sandia a design or a prototype for a component or system.

[1] ECF No. 253-1.

[2] ECF No. 253-2.

[3] ECF No. 253.

7. My colleagues and I followed a structured engineering methodology aimed at understanding the details of the specific component or system design and assessing its actual/potential performance and costs.
8. The methodology we used at Sandia involves the systematic application of the well-established engineering processes of collecting detailed documentation of the design and design analyses of the solar thermal system from the industry client, analyzing this information, and evaluating and assessing the performance and commercial viability of the components and systems.
9. This information often included, but was not limited to, all engineering mathematical models and the assumptions that affect the accuracy of their results; detailed design drawings that demonstrate the application of engineering analysis to achieve performance results such as mechanical properties and thermal performance; and component and system test results that apply specifically to the conditions under which they are conducted and may differ under other operating conditions or in the transition of going from one operating condition to another. All of this information contributes to understanding the actual, long-term performance and costs of operating a solar thermal system.
10. It was not typical for Sandia technical teams to conduct testing at an industry client's facility but we often helped to design and observe tests performed at their sites. These tests would often be directed at answering specific questions and issues raised during our evaluations of their components or systems.

11. Once we collected this information from the industry client, we proceeded to analyze all of the information.
12. We used the expertise of different members of the technical teams to analyze the industry client's design or prototype. My expertise was and is in the areas of systems analysis, applied optics, thermodynamics, fluid mechanics, heat transfer, experimental methods, and applied mathematics. I used my education and training in these areas to evaluate the data and other information provided by the industry client. The Sandia teams provided the industry client with our analysis of the performance and commercial viability of the component or system.
13. We compared our analyses with those reported by the industry client. In many cases, our results were similar to the client's. But in some cases they were significantly different. If our evaluation differed substantially from that of the client's, it could indicate potential issues regarding the performance or cost of operation of a component or the entire solar thermal system. At this point, we would meet with the client and determine how to proceed with evaluating these issues further.
14. Our processes at Sandia were more rigorous, structured, and detailed than those often found among industry clients. But both our processes and those followed by industry clients represent the application of the same engineering and scientific principles that apply to all solar energy technology including, but not limited to, systems analysis, applied optics, thermodynamics, fluid mechanics, heat transfer, experimental methods, and applied mathematics.

15. During my tenure at Sandia National Laboratories, our technical teams evaluated hundreds of solar thermal systems and components using this methodology.

16. I estimate that I was directly involved in evaluating more than 100 solar thermal components and systems including solar concentrators, thermal receivers, various engines, and parabolic trough and dish engine systems.

17. In my consulting work at TRMancini Solar Consulting, I have used an engineering methodology similar to the one I used at Sandia in my work for my clients. I collect information from my clients, I evaluate it using my knowledge, skills, and expertise in the scientific and engineering disciplines required for solar energy technology, and I advise them on the likely performance and costs of their proposed solar energy technology component and/or system.

18. I used an engineering methodology similar to the one I used at Sandia in the work for this case to evaluate the IAS Solar Dish Technology. As I described in my report and my deposition testimony, however, Defendants did not produce the kinds of data, documents, and information that, in light of my professional experience, I expected to see from the developer of a solar energy technology project.

19. It is *always* best to have detailed engineering analysis, engineering drawings, and test data for the components and system from the project's developer when performing an engineering analysis of a solar thermal system.

20. Because Defendants did not provide the typical data, documents, and information I expected to see, I used other facts in this case (fully identified in my report) to reach my opinions.

21. For example, on both January 24 and April 4, 2017, I visited Defendants' "Manufacturing Facility," "R&D Site," and "Construction Site," all in Millard County, Utah.

22. With the exception of the tour of the Manufacturing Facility during the April 4th visit, Neldon Johnson accompanied me and others on both tours. During both visits, Mr. Johnson gave lectures on his ideas and provided commentary as we viewed the three sites. Mr. Johnson's lectures and commentary were vague, contradictory, and inconsistent with scientific and engineering principles.

23. In the course of both site visits, I spent a total of approximately 9 hours with Mr. Johnson.

24. I asked Mr. Johnson specific questions about the IAS Solar Dish Technology. His answers were vague, contradictory, and inconsistent with scientific and engineering principles.

25. Among the documents I reviewed to prepare my report were all of Mr. Johnson's patents. They are among the information I reviewed on www.rapower3.com.[4] At least some of his patents were in Defendants' production of documents. I did not find the information in Johnson's patents helpful in my analysis of the IAS Solar Dish Technology.

26. The publications I wrote and presentations I gave which are listed in in Appendix II of my report were all peer-reviewed.

[4] Pl. Ex. 15; ECF No. 253-1 at 52.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 13, 2017, in Albuquerque, New Mexico.

Dr. Thomas Mancini

DR. THOMAS MANCINI