

SUMMARY

1. This is an action by Relator Dr. Nira Schwartz ("Schwartz"), in the name of the United States Government ("Government"), to recover penalties and damages arising from fraud on a vast scale perpetrated against the Government by Defendants Raytheon Company located at 1510 Hughes Way, Long Beach, CA 90810; Raytheon Company, Electronic Systems, Missile Systems, whose mailing address is P.O. Box 11337 Aeropark Blvd. Tucson, AZ 85734-1337; Raytheon Company located at 141 Spring Street, Lexington, MA 02421 and Raytheon System Company located at 1100 Wilson Blvd. Arlington VA 22209, collectively hereafter known as "RAYTHEON," in connection with its work for the Government's National Missile Defense Program. The claims asserted herein include counts by Schwartz as Relator under the False Claims Act, 31 U.S.C. § 3729 et seq..

I.

JURISDICTION AND VENUE

2. The Court has jurisdiction of this action pursuant to 28 U.S.C. § 1345 and 31 U.S.C. §§ 3732(a) and 3729(a) and (c).
3. Venue is proper in the Central District of California under 31 U.S.C. § 3732(a). A substantial part of the acts or omissions alleged herein occurred within the Central District of California, and Defendant RAYTHEON transacts business in this District.
4. A related case has been filed in the United States District Court for the Central District of California. It bears number CV 96-3065 RSWL (RMCx) and

has been assigned to the Honorable Ronald S. W. Lew.

5. Relator/Plaintiff Schwartz demands trial by jury.

II.

PRELIMINARY STATEMENT

6. The National Missile Defense Joint Program was directed to develop a system to protect the United States ("U.S.") from a limited attack by a hostile nation or terrorist group using ballistic missiles containing weapons of mass destruction. The program is premised on developing an Exoatmospheric Kill Vehicle ("EKV") that can locate, intercept, and destroy an incoming warhead before it lands on U.S. soil. The EKV is fired at the warhead in the upper atmosphere from a ground-based interceptor rocket that is launched by the U.S. after the incoming warhead is detected. If the U.S. is to have a successful missile defense program, it is critical that the kill vehicle reliably perform its interception function in the face of countermeasures an enemy could easily employ to foil the system.

7. The agency implementing this proposed system for the Government was the U.S. Army's Ballistic Missile Defense Organization ("BMDO") and is now the Missile Defense Agency. After inviting three defense industry contractors to develop and test EKV's, BMDO awarded the contract to further develop and test the EKV to RAYTHEON between September of 1998 and January of 1999. Among other things, RAYTHEON obligated itself to develop a technology that enabled the EKV to locate the warhead and, in particular, to distinguish between

a real incoming warhead and any of a variety of other objects or decoys that might be launched or released with the warhead so as to foil interception. This critical distinguishing technology is called "discrimination" technology.

8. In contracting with the Government and performing services pursuant to the contract, RAYTHEON selected a discrimination technology approach at the outset that was fundamentally flawed, both technically and physically. From at least March of 1997, RAYTHEON learned through tests, studies, and simulations, that its discrimination technology not only did not work, but that it was so flawed in its basic methodology that it could never be made to work without a radical change in approach that they did not undertake. Had RAYTHEON immediately disclosed such flaws, the Government would have been well-positioned to quickly change course, pursuing a wholly different technological approach for missile discrimination, perhaps through a different contractor, and the U. S. might now have a working missile defense prototype system. But rather than disclose such flaws when they were discovered, RAYTHEON made repeated claims to the Government that its discrimination technology was or would be effective to a very high degree, supposedly meeting or exceeding all contract requirements. In fact, RAYTHEON knew the technology that it had developed had failed catastrophically and would not and could not function anywhere near the level represented by RAYTHEON and required by the Government contract. Its numerous claims to the Government as to the efficacy of its discrimination technology were false. The EKV is not in fact able to perform its intended task effectively or anywhere near contractual requirements. Because of its fraud, RAYTHEON delayed the successful development of an effective missile defense technology by the United States by

years.

9. RAYTHEON disregarded well-established scientific and engineering principles and methods, and, in a reckless disregard for the truth, engaged in a systematic campaign to cover up the flaws so as to continue to receive compensation, awards, fees, bonuses, and future work from the Government. Its statements, concerning compliance of its discrimination technology with contract requirements, contradicted test data it had collected but failed to disclose. This misconduct began no later than March of 1997 and has continued in various forms through the duration of this lawsuit.

10. RAYTHEON falsely represented to the Government that contract specifications had been satisfied or even exceeded, reporting to the Government that its discrimination technology succeeded in identifying the warhead as the contract required.

11. Since at least 1997, RAYTHEON has misrepresented that warheads have physical flight characteristics, which are different from the physical flight characteristics of decoys that are, themselves, different from the physical flight characteristics of other objects. RAYTHEON has further misrepresented that these characteristics are sufficiently different, one from another, to allow the identification of warheads from all other objects.

12. RAYTHEON also falsely claimed that its system functioned under a wide range of conditions, including those where accurate data on the incoming

warhead are not, and cannot be made, available, or where the incoming warhead happened to be 'tumbling" instead of spinning as it traveled -- as would very likely be the case with any crude warhead used by a sub-national terrorist organization.

13. In 1998, Schwartz communicated with Dr. Sheldon Ward, a manager at the RAYTHEON facility at P.O. Box 11337 Aeropark Blvd. Tucson, AZ 85734-1337, the RAYTHEON place of business in Tucson, AZ., and disclosed to, and discussed with, him the anomalies and problems in the RAYTHEON discrimination technology. In 2001, Schwartz communicated with Govinda Kuntimad, Joe Spezeski , Fred Severance, Alex [Last name unknown at ATR], at the same facility, and disclosed to, and discussed with, them the flaws in the technology and the scientific reasons why it did not, and could never, work to the contractual requirements.

14. RAYTHEON was awarded the contract to further develop and test the EKV in 1998. In March of 1997, it had reported a relatively low probability of successfully identifying the warhead. By December 1997, it reported a high probability of successfully identifying the warhead. The concept upon which the technology was based did not change between the two dates. At the time it was awarded the contract, it knew that its technology did not and could not work.

15. RAYTHEON conducted ground simulations, which are substantially less expensive than flight tests, that conclusively demonstrated the inefficacy of the technology. Nonetheless, it did not disclose this to the Government and the Government, relying on what had been represented to it, authorized several

major flight tests that were unjustified and cost the Government hundreds of millions of dollars.

III.

THE PARTIES

16. Schwartz, born in 1946 in Israel, is an American engineer with a combined specialty in physics, mathematics, and electronics. She obtained her doctorate from the University of Tel Aviv in 1979. After working for years as a consulting specialist in optics, image processing, computers, voice compression, and pattern-recognition physics, Schwartz was employed by TRW from September 1995 until late February 1996 in the Space and Technology Division of TRW's Space and Electronics Group in Redondo Beach, California. Her hiring supervisor called her "almost uniquely qualified" to assist TRW in these highly technical areas. While at TRW, Schwartz was a Senior Staff Engineer, with a "secret" security clearance, who was involved in testing and analyzing the algorithms, computer programs, technologies, mathematical and physical concepts, and signal phenomenology being researched and developed by TRW for BOEING under the National Missile Defense program. After being terminated from her position at TRW when she threatened to inform the Government of the inefficacy of the TRW technology, Schwartz consulted with the Defense Criminal Investigation Service (hereafter "DCIS") and, as a Government expert on the technology, became familiar with the RAYTHEON technology. Schwartz brings this action on behalf of herself individually and on behalf of the United States of America pursuant to the provisions of 31 U.S.C. § 3730(b)(1).

17. Schwartz is informed and believes, and on that basis alleges, that RAYTHEON is an out of state corporation. It is doing business in California, among other places. Its place of business in Long Beach, California is: 150 Hughes Way, Long Beach, CA 90810.

IV

FACTUAL BACKGROUND

A. The Raytheon Contracts

18. In 1990, the Government awarded Hughes Electronic Corporation ("Hughes") a contract for the development of the EKV. Hughes, later acquired by RAYTHEON in 1997, was one of three prime contractors awarded such a contract simultaneously; the other two being Martin Marietta Corporation, and Rockwell, which was itself acquired by BOEING in 1996.

19. The three prime contractors were in competition simultaneously to develop the EKV technology among other things. A competitive selection process would eliminate one of the three in 1994, and the other two would then compete to obtain the final sole prime contract for the system which included the EKV. In 1990, BOEING added TRW to its competing team. In 1994, Martin Marietta Corporation was eliminated from the competition, leaving RAYTHEON to compete with the BOEING/TRW team.

20. In 1998, the BOEING and the Government selected RAYTHEON to be the Lead Contractor to develop the EKV. BOEING was chosen as the Lead System Integrator for the missile defense program and also continued as the prime contractor for the Ground Based Interceptor that included the EKV. After Schwartz exposed the numerous faults of TRW's discrimination system, TRW

was dropped from competition no later than October of 1998, but it was not notified in writing of the termination of the Purchase Order under which it was developing the EKV technology until April 5, 1999, long after RAYTHEON was selected as the Lead Contractor to develop the EKV.

21. Schwartz is informed that the TRW and BOEING Contracts have been modified several times and, on that basis alleges, on information and belief, that the Raytheon Contract has been modified several times since 1990. Unless specified otherwise, the term "Raytheon Contract" means the original Raytheon Contract and any modifications in effect at the time of the particular events described herein.

22. The Army's prescribed Scope Of Work for the Raytheon Contract is described in document SW-K08-90 (the "Raytheon Scope Of Work"). Schwartz is informed that the TRW Scope of Work has been modified several times and, on that basis alleges, on information and belief, that the Raytheon Scope of Work has been modified several times since 1990. Unless specified otherwise, the term "Raytheon Scope Of Work" means the original Raytheon Scope Of Work and any modifications in effect at the time of the particular events described herein. The Raytheon Scope Of Work contains some of the RAYTHEON contractual obligations.

23. Schwartz is informed that TRW was issued a Statement of Work in 1991 and on that basis alleges, on information and belief, that Raytheon was issued a Statement of Work sometime in the 1990's. Schwartz is informed that TRW's Statement of Work has been modified several times and, on that basis

alleges, on information and belief, that the Raytheon Statement of Work has been modified several times since 1990. Unless specified otherwise, the term "Raytheon Statement of Work" means the original Raytheon Statement of Work and any modifications in effect at the time of the particular events described herein. The Raytheon Statement Of Work contains some of the RAYTHEON contractual obligations.

24. The Government's technical requirements and specifications for the Raytheon Contract are set forth in what is called the Technical Requirements Document ("TRD"), The TRD has undergone numerous modifications since 1990. Unless specified otherwise, the term "TRD" means the original TRD and any modifications in effect at the time of the particular events described herein, including ,without limitation, a revision of the TRD dated September 28, 1993. The TRD contains some of the RAYTHEON contractual obligations.

25. The TRD explicitly specifies the range of expected threat conditions under which EKV designs must provide an effective and robust defense. These specifications are defined in Table 2.0-1 of Appendix 2 of the TRD. The TRD refers to these specifications as the "near-term threat scenarios," and it requires a specific level of robustness in the technology so that re-development of the technology as a result of flight tests is eliminated.

26. The TRD's near-term threat scenarios prescribe specific missile threat types, specific attack conditions, and various warhead aim points. RAYTHEON is required by the TRD to develop a system to defend effectively against these scenarios. A central element of the threat scenarios is the specification, in the

TRD, of the countermeasures employed by the enemy with each warhead, including the warhead's own physical characteristics, the number and types of decoys released with the warhead, and descriptions of other objects or conditions, such as missile debris, that could potentially confound interception.

27. The countermeasures an attacker can use to confuse, overwhelm, or otherwise defeat a system are of critical importance to missile defense. Each of the countries that have deployed long-range ballistic missiles (Britain, China, France, Russia, and the United States) has developed, produced and, in some cases, deployed such countermeasures for its own ballistic missiles. North Korea is likewise developing such countermeasures. The ability to defend effectively against such countermeasures is a critical feature of missile defense, and is thus appropriately reflected in the specifications of the Government's TRD.

28. The TRD places specific bounds for a range of physical conditions that are considered "normal" and over which the system must be able to function. The TRD also requires that the system design be able to effectively deal with each of the threat scenarios under "off-normal," sometimes known as "off-nominal," conditions – for example, when the behavior of the warhead is outside the expected range. Moreover, the TRD requires discrimination against tumbling warheads and unauthorized and unpredicted launches.

B. RAYTHEON's Discrimination Technology

29. RAYTHEON tested the performance of its discrimination technology, once developed, using data from computer simulations and from actual flight tests. The simulated data were based on near-term missile threat scenarios and

other specifications provided in the Government's TRD. For the real flight tests, RAYTHEON was to measure the performance of its technology against actual detailed warhead and kill vehicle flight data. Both types of tests -- simulated and actual -- revealed to RAYTHEON that its discrimination technology was not effective and, in fact, materially failed to meet key contract requirements.

30. No later than 1997, RAYTHEON determined that, without detailed and accurate advance physical information on the incoming warhead that could never be available in the real world, its discrimination technology did not and could not comply with contract requirements. Despite a contractual obligation to do so, RAYTHEON failed to notify the Government about these negative findings and continued to assert that contract requirements were or would be satisfied.

31. In 1998, Schwartz personally informed Dr. Sheldon Wald of RAYTHEON that the Mission Data Load ("MDL"), which contains the reference data against which the data obtained from the incoming missile and its payload is compared for the purpose of identifying the warhead, incorporates information that can never be known prior to the attack for many of the threat types. Schwartz also pointed out to Dr. Wald that the Infrared ("IR") Signal and threat phenomenology analyses show that the features extracted for differentiation, i.e., the identification of incoming deployed objects, be they warheads, decoys or debris, change as those objects travel through space. Those extracted features contain no consistent characteristics to which values can be ascribed. They are constantly changing. Further, Schwartz added, those features values are highly sensitive to background noise, earth-shine spikes, a nuclear environment, and gaps in the signal, all of which are to be expected and are

within the TRD and Statement of Work requirements. All of that, she concluded, dooms the discrimination technology. Not only has it never been in compliance with contractual requirements, it can't ever be. Because the discrimination technology is not in compliance with the TRD and other contractual documents, the Navigation, Guidance and Control components in the EKV cannot work either.

V.

SCHWARTZ REPORTS HER FINDINGS AND IS CORROBORATED

A. Schwartz' Work on the Discrimination Technology

32. While employed at TRW, Schwartz was responsible for analyzing many key aspects of the TRW discrimination technology. As part of her work Schwartz reviewed most, if not all, of TRW's test results and performance reports provided to the Government from 1993 to 1996, as well as internal reports that had not been provided to the Government during those same years. Schwartz recorded her findings in numerous reports, test files, computer files, and weekly and daily Quick Mail messages that she sent to TRW colleagues. Schwartz's analyses were supported by extensive computer-based testing that she conducted with the assistance of other employees at TRW.

33. After being terminated at TRW for threatening to inform the Government of her findings, Schwartz became a Government consultant focusing on the discrimination technology. She produced more than thirteen (13) reports and made hundreds of recommendations. She wrote thousands of pages, devoting at least 4500 hours over the three years. Schwartz reported her findings to GAO investigators, Department of State officials, Pentagon officials, DOD

officials, BMDO officials, GBI officials, Army officials, DCIS investigators and DOJ investigators and attorneys.

B. Schwartz Reports Her Findings to Raytheon

34. Ironically, she also reported her findings to RAYTHEON. During 1998 and 1999, Schwartz communicated with Dr. Sheldon Wald, an EKV project manager at Raytheon Company, Missile Systems, located in Tucson, Arizona and informed him about the anomalies and problems in the EKV discrimination technology that was based on IR signal features extraction. Schwartz also informed Dr. Wald that the TRW EKV discrimination technology appeared to work because TRW fraudulently adjusted its MDL, after the test flight, to incorporate flight test data. It also adjusted its MDL to account for signal contamination such as spikes, dips and gaps. Further, the technology was highly dependent on knowing the characteristics of the deployed objects. She advised Dr. Wald that in fact, the technology couldn't work. The scientific assumptions on which it was based were flawed. The concept was wrong. In 1998, Schwartz provided Dr. Wald with unclassified copies of her tests, analyses and validation reports, as well as unclassified reports on discrimination technology from the Phase One Engineering Team ("POET"), made up of representatives from Aerospace Corporation, Lawrence Livermore National Laboratory and Massachusetts Institute of Technology. In May 2001, Schwartz provided Govinda Kuntimad, Joe Spezeski, Fred Severance, Alex [Last name unknown at ATR], at Raytheon Company, Missile Systems, located in Tucson, Arizona with additional unclassified documents, repeated her findings and expressed her concerns that the EKV technology was based on false scientific principles, that it was not robust and that it did not comply with TRD requirements.

C. Schwartz Reports Her Findings to the Government

35. In May 2001, Schwartz found, to her dismay, that, in spite all her communications with RAYTHEON that TRW's technology was premised on unsupportable scientific principles, the Raytheon Company, Missile Systems, located in Tucson Arizona, had developed EKV discrimination technology that was premised on those very same principles. On June 1, 2001, Schwartz called Mr. Bill Kline, a Department of Justice Investigator and informed him that RAYTHEON was in violation of the False Claims Act. A copy of the initial complaint in this case was emailed to him at bill.kline@usdoj.gov on that date.

D. Discrimination Technology Flaws Confirmed By Independent Study

36. In 1998, the Defense Department commissioned the Phase-One Engineering Team ("POET") to conduct an independent review of discrimination technology. The POET study affirmed many of the allegations of this lawsuit as they relate to discrimination technology. The Government Accounting Office ("GAO") has published a classified report, which finds that RAYTHEON discrimination technology suffers from the same deficiencies as the TRW discrimination technology. The GAO has published an unclassified report addressing some of the TRW discrimination technology deficiencies.

VI.

RAYTHEON'S FALSE CLAIMS TO THE GOVERNMENT

37. RAYTHEON knowingly and deliberately submitted to the Government false performance reports; graphs predicated on false data; false test plans and procedures; and invoices based on false claims concerning RAYTHEON's

Discrimination and Guidance, Navigation and Control technologies.

RAYTHEON has been paid many of millions of dollars by the Government over the period from at least January 1993 through at least May 2001 in connection with the Government Contracts to develop and test the EKV. The false statements enumerated herein were presented in writing to the Government in Huntsville, Alabama and in Tucson, Arizona. In reliance on these and other statements, which were false or made in reckless disregard for the truth, the Government authorized multiple flight tests. Those flight tests, which have occurred from August 1998, have been enumerated IFT-2, IFT-3, IFT-4, IFT-5, IFT-6, IFT-7, IFT-8 and IFT-9. Each of those flight tests cost over one hundred million dollars. (\$100,000,000).

38. RAYTHEON's reports to the Government falsely claimed that the performance of its discrimination technology complied with contractual requirements. RAYTHEON falsely represented to the Government that its analytical mathematical tool, sometimes known as the Neural Connection, could be used effectively for discrimination when its own data showed that in the majority of tests, the technology had materially or catastrophically failed to perform. In fact, the analytical mathematical tool might have worked well, but the data that it was processing had been subjected to corrosive forces, such as a simulated nuclear environment and earth-shine spikes and dips as well as data gaps, to an imperfect MDL, and to overlaps in the range of the contractual parameters' values as specified in the contract documents, all of which corrupted the analysis, producing inconsistent and unreliable results. The RAYTHEON discrimination technology was fragile and not robust. Minor perturbations in MDL caused the technology performance to fail catastrophically. RAYTHEON

falsely represented the probability for successful discrimination, recklessly ignoring, or fraudulently withholding from the Government, the majority of the data they had collected indicating that the system performed far below the standards required under the TRD, the Raytheon Contract, the Raytheon Scope of Work and the Raytheon Statement of Work, as well as other contractual documents.

39. RAYTHEON falsely represented that its discrimination system could select clusters of objects containing warheads from among widely spaced clusters of objects only some of which contained warheads and afterwards identify the warhead or warheads, selecting it or them from among the decoys and debris in the selected cluster or clusters, as required in the TRD, the Raytheon Contract, the Raytheon Scope of Work and the Raytheon Statement of Work as well as other contractual documents. RAYTHEON knew or, at least, should have known, that, in fact, selection between even two clusters, one containing a warhead and the other one not, is impossible using the RAYTHEON discrimination technology.

40. In order to receive payment from the Government pursuant to the Raytheon Contract, directly or indirectly, RAYTHEON knowingly, or with reckless disregard for the truth, made representations contrary to fact, and/or failed to disclose material matters, that it had a duty to disclose, to the Government about the capabilities and robustness of its discrimination technology, and it falsified and withheld crucial data showing that its technology did not meet key contract requirements.

41. Beginning in at least March of 1997 and continuing through at least May 2001, RAYTHEON knowingly, or with reckless disregard for the truth, presented or caused to be presented to the Government false and fraudulent claims for payments, costs, compensation, and awards, under its contracts with the Government, for the research and development of the discrimination technology for the EKV used in the proposed National Missile Defense system. These claims were false and fraudulent, were contained in or based on the false statements and representations described herein and were further based on false supporting records likewise submitted by RAYTHEON to the Government.

42. RAYTHEON knowingly, or with reckless disregard for the truth, presented, or caused to be presented, to the Government, for payment or approval, false or fraudulent claims, these claims being the requests for payment and the certifications submitted to obtain such payments, each instance being in violation of 31 U.S.C. § 3729(a)(2).

43. RAYTHEON knowingly, or with reckless disregard for the truth, made or used, or caused to be made or used, false statements in order to have their false or fraudulent claims paid or approved for payment by the Government, such statements being further described herein, each instance being a violation of 31 U.S.C. § 3729(a)(2).

44. As a result of RAYTHEON's conduct, as described herein, the United States Government suffered actual damages of at least hundreds of millions of dollars in the form of payments for services that were fraudulently rendered and/or known to be useless; payments for tests, including actual flight tests, that

were themselves fraudulent and/or fraudulently made useless in furthering the government's objectives and/or in testing contract technical requirements; and payments for the redundant development of discrimination technology, known, by both TRW and RAYTHEON, to be virtually identical, without either of them notifying the Government, each such item of damages, and others, to be determined at trial. Pursuant to the provisions of the False Claims Act, each such determined item of damages should be trebled.

PRAYER FOR RELIEF

WHEREFORE, Schwartz prays for judgment against RAYTHEON as follows:

1. For treble the damages sustained by the Government.
2. For civil penalties of ten thousand dollars (\$10,000) for each false claim submitted to the Government and for each false statement made or used to induce each such false claim being paid or approved by the Government.
3. For interest on the treble damages from the date on which the original Complaint in this action was filed.
4. For all costs and expenses of this civil action, with interest thereon.
5. For such other and further relief as the Court deems just and equitable.
6. In addition, Schwartz, acting on her own behalf, demands and seeks that an award be made in her favor as follows:
 - i. For thirty percent (30%) of such proceeds.
 - ii. For all reasonable expenses incurred by Schwartz in relation to this proceeding, plus all reasonable attorneys' fees and costs.

iii. For such other and further relief to which Schwartz may
be entitled.

Date: November 9, 2002

Victor T. Barrera, Esq.

Attorney for Plaintiff/Relator

PROOF OF SERVICE

STATE OF CALIFORNIA, COUNTY OF LOS ANGELES

I, the undersigned, declare: that I am a resident in the aforesaid County; I am over the age of 18 and not a party to the within entitled action; my home address is 2800-187 Plaza Del Amo, Torrance, California 90503.

On October 11, 2002, I served upon the interested party(ies) in this action the foregoing document(s) described as:

Case CV-01-4937 RSWL (RMCx) Hon. Ronald S. Lew
FIRST AMENDED COMPLAINT

By placing _____ the original(s) ___X___ true copy(ies) thereof enclosed in sealed Envelope(s) addressed to: See attached Service List

I declare under penalty of perjury under the laws of the State of California that the above is true and correct. .

Executed on November 11, 2002, at Los Angeles, California.

Richard Woods

SERVICE LIST

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