

**T.C. Memo. 2014-201**

**ERIC G. SUDER, ET AL.,<sup>[1]</sup> Petitioners,**  
**v.**  
**COMMISSIONER OF INTERNAL REVENUE, Respondent.**

Docket Nos. 14435-09, 14460-09, 6183-10, 6210-10.

**United States Tax Court.**

Filed October 1, 2014.

\*2 Jeremy M. Fingeret, John H. Dies, and Robert G. Wonish II, for petitioners.

Julie Ann P. Gasper, Lauren Laravia, and Duy P. Tran, for respondent.

## **MEMORANDUM FINDINGS OF FACT AND OPINION**

VASQUEZ, Judge.

In 1987 petitioner Eric Suder found himself unemployed when his employer, Candela Electronics (Candela), went out of business. As he searched for a new job, an opportunity presented itself. He recalled that Candela had sold a large volume of its private branch exchanges (PBXs) to Radio Shack, and that Radio Shack had little success in reselling them. He contacted Radio Shack and succeeded in negotiating the purchase of Candela PBXs for cents on the dollar.

Mr. Suder started a company out of his garage called Estech Systems, Inc. (ESI), through which he tested, repackaged, and resold the Candela PBXs at a profit. That provided some income in the short term, but supply of the Candela PBXs was limited. Mr. Suder recognized that he needed a steady stream of products for the long term. His vision was to design his own innovative, full-featured telephone systems for small and midsize businesses.

Through hard work and ingenuity, Mr. Suder gradually turned his vision into reality. In 1988 he hired his first employee at ESI.<sup>[2]</sup> In 1989 he designed ESI's first product—an embedded system called "Phone Bill" which approximated the cost of a long-distance telephone call using bands instead of rate tables. He marketed Phone Bill to motels that could not afford a system that operated on the more expensive rate tables. A year or so later, he moved ESI from his garage into an office building, hired five or six additional employees, and spearheaded the design of ESI's second product—an embedded system called "Roll Call" which automated wake-up calls for motels through their phone systems.

The success of Phone Bill and Roll Call prompted Mr. Suder to take on increasingly sophisticated projects. He pioneered the development of an auto-attendant circa 1990, an auto-attendant with voice mail storage circa 1990-91, an automated voice mail system circa 1992-94, and ESI's first phone system circa 1996. By 2004 he had grown ESI into a thriving company with approximately 125 employees, including a team of roughly 40 engineers, and gross revenues of approximately \$38.5 million.

These cases concern tax years 2004 through 2007. For each of those years, ESI timely filed a Form 1120S, U.S. Income Tax Return for an S Corporation, in which it claimed a credit for increasing research activities under section 41 (research tax credit).<sup>[3]</sup> Mr. Suder, who owned 90% of the shares of ESI, claimed flowthrough research tax credits of \$445,987 for 2004, \$440,306 for 2005, \$454,526 for 2006, and \$442,557 for 2007 on Forms 1040, U.S. Individual Income Tax Return. Petitioner Douglas Boyd, who owned the other 10% of the shares, claimed flowthrough research tax credits of \$46,748 for 2004, \$46,624 for 2005, \$48,870 for 2006, and \$48,378 for 2007 on Forms 1040.

On March 19, 2009, and January 25, 2010, respondent mailed notices of deficiency to Mr. Suder and Mr. Boyd disallowing the research tax credits they claimed for 2004-05 and 2006-07, respectively, and determining accuracy-related penalties.<sup>[4]</sup> Mr. Suder and Mr. Boyd, both of whom resided in Texas, timely filed petitions with this Court. We consolidated their cases for trial, briefing, and opinion.

In July 2013 we held a three-week special trial session in Dallas, Texas. We heard more than 3,500 pages of testimony and received into evidence more than 170,000 pages of exhibits. On the basis of this substantial record, there is no doubt that ESI conducted significant research and development activities throughout the years at issue. The threshold question in these cases is whether these activities constitute "qualified research" within the meaning of section 41(d). \*

If so, we must decide whether ESI adequately substantiated its "qualified research expenses" (QREs) and whether Mr. Suder's wages were reasonable QREs within the meaning of section 174(e). Lastly, we must decide whether Mr. Suder or Mr. Boyd is liable for penalties under section 6662(a).

## FINDINGS OF FACT

### I. SI's Senior Management

During the years at issue Mr. Suder served as the chief executive officer (CEO) of ESI. However, he did not perform the typical duties of a CEO. He spent most of his time brainstorming ideas for new products and ways to improve existing products. The inspiration for his ideas came from various sources, including reseller feedback, online research, trade publications, and alpha testing of ESI's products, which he personally performed. His coworkers thought of him as the "chief idea guy" and the "product visionary".

He is named as an inventor on 13 patents, the applications for which predate or postdate the years at issue, and one patent reissuance, the application for which was filed on June 3, 2005.

Mr. Suder spent little time managing the day-to-day operations of ESI's business. He left that task primarily to Mr. Boyd, who was ESI's president and chief operating officer at the time. Mr. Boyd was in charge of, among other \*7 things, the manufacturing, tech support, sales, finance, and human resources departments of ESI. He spent much of his time dealing with money matters, but because ESI's focus was on product development, he felt it was important to devote part of his time to that as well.

The other two key players at ESI were Harvey Wende and Buzz Hansen. Mr. Wende reported to Mr. Boyd, but he spent much of his time working directly with Mr. Suder on product development. Mr. Wende's official titles were senior vice president of product operations from 2004 to 2006 and senior vice president of product development in 2007. His functional role in both positions was to lead the product development teams at ESI, including the engineering groups, the product assurance lab, and the test technicians.

Mr. Hansen was ESI's chief technology officer. He had more technical expertise than any other member of ESI's senior management. His job was to design the architecture of new products.<sup>[5]</sup> This entailed researching new technologies, deciding what technologies to incorporate into ESI's products, selecting appropriate electronic components, and writing high-level concept diagrams (known as block diagrams). As time permitted, Mr. Hansen also helped \*8 ESI's engineers in implementing his architecture. Mr. Hansen is also named as an inventor on the 13 patents and the reissued patent mentioned supra p. 6. II. ESI's Product Development Process

ESI became ISO-9000 certified in 2000. ISO-9000 is a series of quality management standards promulgated by the International Organization for Standardization. These standards are designed to ensure quality and consistency in a company's internal processes. As part of its ISO-9000 certification, ESI created a systematic product development process, which remained in place during the years at issue.

### A. Concept Development

The process began with senior product strategy meetings. These meetings were held weekly and generally lasted between 1-1/2 and 2 hours. ESI's senior management, comprising Mr. Suder, Mr. Boyd, Mr. Wende, and Mr. Hansen, attended the meetings. The purpose of the meetings was to cultivate new ideas and assess their feasibility at the macro level.

Senior management, and Mr. Suder in particular, had no shortage of great ideas. The challenge was figuring out how to transform these ideas into viable products. Senior management conducted followup meetings and consulted with senior engineers within ESI to determine the major components for each new \*9 product. The goal was to select components that could achieve the desired functionality of the new product in the most cost efficient manner.

Once the components had been selected, Mr. Hansen drafted the block diagram for the new product, which would show how the major components interacted. Senior management assigned a product manager to the new product. The product manager worked closely with Mr. Wende and ESI's engineers to draft specifications for the new product. The specifications often went through multiple iterations. Senior management remained very involved in this process and provided feedback to the product managers along the way. A new product was given a codename and the green light for

hardware and/or software development only after Mr. Suder, Mr. Boyd, Mr. Wende, and Mr. Hansen had each signed off on the specifications.

## B. Hardware and Software Development

Many product development projects had both a hardware and a software component. Hardware development always preceded software development because hardware involved additional cost considerations and was harder to change than software. Both the hardware and the software in ESI's products were (and still are) proprietary. The hardware was designed in-house by ESI's hardware engineers, and the software was written in-house by ESI's software \*10 engineers. The hardware and software functioned as an integrated system. As a general matter, neither the hardware nor the software of a competitor would work with ESI's products.

When the hardware engineers began working on a new project, the engineers were generally given the block diagram and the specifications for the product being developed. The block diagram showed only the major components; it generally would not show smaller components such as resistors, capacitors, and transistors, or the traces between them. One of the first tasks for the hardware engineers was to create a schematic from the block diagram.<sup>[6]</sup> This process generally took two to six weeks, depending on the complexity of the product.

Creating the schematic involved a lot of research. The hardware engineers looked at written materials such as data sheets, design manuals, and application notes, consulted with field service engineers, and searched online for examples of how others have used the same or similar components. Because ESI's hardware was all proprietary, the engineers could not just copy the schematic from somewhere else and expect it to work with ESI's products. The engineers instead \*11 gathered general design information and used this information and their engineering expertise to create the schematic.

ESI contracted with an outside company called Alta Via to create electronic fabrication and assembly drawings (gerber files) for each schematic. The gerber files showed the physical placement of the components and the connections between them on a circuit board. Hardware engineers at ESI worked closely with Alta Via in a back-and-forth process that often took as long as creating the schematic itself.

The next step in the hardware design process was to manufacture physical prototypes from the gerber files. ESI contracted with GTECH, another outside company, to manufacture around 20 of each prototype for testing.<sup>[7]</sup> After receiving the prototypes from GTECH, the hardware engineers at ESI carefully inspected the prototypes to verify that they were manufactured according to the specifications. They then performed a number of tests to verify that the prototypes were functioning correctly, including tests using oscilloscopes to measure signals and frequencies and tests using volt meters to measure voltages.

If the prototypes passed all of the hardware engineers' tests, the prototypes were then transferred to ESI's software engineering group. ESI's software \*12 engineering group was divided into three specialties: (1) firmware, (2) call processing, and (3) graphical user interface (GUI). Firmware engineers wrote low-level code that allowed the hardware components to recognize each other and communicate with one another. Call processing engineers wrote low-level code that gave the hardware its intended functionality. GUI engineers wrote high-level code for PC-based applications.

The firmware engineers were generally the first software group to receive the prototypes. They did part of their coding in assembly language and part in C. Assembly language is essentially the native language of hardware. C is a computer programming language that more closely resembles English. One of the major challenges for the firmware engineers was to get the timing right on components such as microcontrollers and DSPs. Steven Wootton, a digital signal processor (DSP) and firmware engineer at ESI during the years at issue, described firmware coding as an iterative process involving a lot of testing and retesting. He used logic analyzers to test snippets of code and build on or modify the code on the basis of the test results until the timing was right within milliseconds.

The call processing engineers wrote application code, generally in C, that gave the prototypes their intended functionality. The code controlled what happened, for example, when a user pressed a certain key or accessed a certain \*13 feature. The call processing engineers generally layered their code on top of the firmware code. Unlike the firmware code, which was specific to each individual component, the call processing code often affected the system as a whole. The call processing engineers extensively tested their code and fixed the bugs that they spotted.

The GUI engineers wrote code for PC-based software that was used in conjunction with ESI's phone systems. During the years in issue, they worked primarily on two types of projects: (1) projects to configure the operation of the switch in ESI's phone systems (i.e., to customize the behavior of the phone systems) and (2) projects that added features and/or

flexibility for end users. Project requirements were generally defined by senior management and passed along to the GUI engineers through their product managers. The GUI engineers were tasked with implementing the interface design described in the project requirements. Like ESI's other engineers, they also spent a significant amount of time fixing errors and bugs that arose.

## C. Testing

14 After ESI's hardware engineers created a prototype of a new product and ESI's firmware and call processing engineers wrote code for the prototype, it was sent to ESI's in-house product assurance lab for further testing. If the prototype \*14 was an addition to an existing phone system, such as a port card or handset, it was tested both on its own and in the phone system. GUI applications were also tested by the product assurance lab.

The lab performed a number of tests, including smoke tests, basic tests, and regression tests. Smoke tests were short tests that were used to identify any major failures in the prototype. Basic tests were extended tests that were used to examine the functionality of the prototype. Regression tests were the most thorough tests run by the product assurance lab and generally took four to six weeks to complete. As part of a regression test, the product assurance lab tested a prototype extensively for the existence of any defects.

The product assurance lab generated a bug report for each problem that it identified. ESI kept a searchable database of these bug reports. Product managers reviewed the bug reports and prioritized them for repair. ESI's engineers reproduced the bugs in the bug reports, fixed them in order of priority, and returned the prototypes to the product assurance lab for further testing. Every once in a while, the product assurance lab discovered a serious bug that required ESI's engineers to redesign the prototype.

15 After the product assurance lab had finished its testing, the prototype was alpha tested by ESI's engineering department. ESI's engineering department \*15 installed the prototype in its phone system (or if the prototype was itself a phone system, replaced its phone system with the prototype) and used it in ESI's business. Mr. Suder was actively involved in the alpha testing process. There was not a single prototype that Mr. Suder had not personally "touched, played with, and blessed" during the alpha testing process.

The last stage of testing before commercial production was beta testing. ESI solicited its resellers to find beta testers for a new product. The beta testers were offered the product at a discount in exchange for agreeing to test the product in their businesses and to provide feedback on its performance. While the number of beta testers varied from product to product, ESI tried to find a minimum of 20 to 25 beta testers for each new product. ESI's engineers continued to fix bugs in the product during the beta testing process and after the product was available for sale to the public.

## III. The 12 Stipulated Projects

16 ESI claimed QREs for 76 projects during the years at issue. The parties selected 12 of the 76 projects and stipulated that these 12 projects are representative of the 76 projects for purposes of determining whether ESI performed qualified research under section 41(d). The record contains extensive testimonial and documentary evidence with respect to the 12 projects. Much of \*16 this evidence is highly technical and includes bug reports, software release notes, specifications, schematics, gerber files, and testing data. After careful review of the evidence, we find that ESI followed a product development process substantially similar to or the same as that described supra pp. 8-15 for each of the 12 stipulated projects.<sup>[8]</sup> We briefly describe each of the 12 projects below.

### A. Arcadia

Arcadia was a software application that ESI offered as an optional configuration of its VIP suite. The VIP suite was a series of software applications that operated on a personal computer (PC). These applications gave a user access to certain features and functionality of an ESI phone system through a PC. For example, a user could dial phone numbers, answer phone calls, and transfer calls through the VIP suite. Arcadia added automatic call distribution (ACD) reporting to the VIP suite. This feature had not been available in any prior ESI product.

17 ACD is a feature that gives a phone system the ability to manage multiple incoming phone calls. ACD routes an incoming call to the appropriate operator according to a predefined formula (e.g., a call might be routed to the operator who \*17 has been off-hook the longest) or places the caller on hold if no operator is available. The Arcadia program extracted statistical information on the ACD feature from the phone system and displayed this information in real-time on

a PC. Arcadia also stored this information digitally, which allowed a user to generate historical reports comparing the performance of the ACD system over time.

## B. Chameleon

Chameleon was a project within the VIP suite that incorporated a third-party skinning tool allowing a user to change the look and feel of the VIP user interface. It gave a user the ability to change the colors, fonts, button shapes, and button sizes on the screen. It did not change the functionality of the VIP suite. Mr. Wende likened the Chameleon project to giving a person the choice of a paint color on an automobile.

## C. Clark Kent

18 Clark Kent was a project within the VIP suite that added statistical information reporting to another ESI product called Pink Panther. Pink Panther was a radio frequency identification (RFID) card reader that controlled access to a building and to secure areas within a building through the phone system. Pink Panther kept track of when employees entered and exited a building and stored this information in its internal hard drive. Clark Kent was designed to extract this \*18 information from the Pank Panther system and to display it on a PC. Clark Kent was abandoned at the specifications stage of development because senior management decided to devote ESI's limited engineering resources to other projects.

## D. Mad Max

Mad Max was a softphone that ESI developed as an optional addition to the VIP suite. Mad Max functioned as a remote extension of an ESI phone system, allowing a user to make phone calls from a PC while traveling. When the user placed a call, Mad Max connected the user's PC to the ESI phone system through the Internet. The user was able to control the phone call through button commands on the user's PC. One of the main challenges of the Mad Max project was developing a roaming protocol that was capable of transferring phone calls through hotel routers and firewalls.

## E. Rio Grande

The Rio Grande project was a complete redesign of the PC-based software application used for programming an ESI phone system. ESI's phone systems were not plug-and-play out of the box, meaning they had to be programmed and configured to work properly. This could be done in one of two ways: (1) through the dial pad on the phone system or (2) through a PC-based application.

19 \*19 The PC-based application that existed before Rio Grande was "real old technology", according to Mr. Wende. It was written in Visual Basic, a programming language that Microsoft had stopped supporting. Rio Grande was written to work on Microsoft's new .NET framework. Rio Grande also added several new programming features, including "live programming", which allowed features to be programmed in real time.

## F. Express FSII

Express FSII was a set of 27 proposed software features that ESI planned to add to its phone systems. These features included, among others, live ring call waiting, which displayed the name and phone number of a person calling when a user was on the line with another caller, and ACD auto wrap, which allowed a user to designate how much time was needed before taking the next phone call. ESI's product managers, in consultation with senior management, drafted specifications for each of the 27 features. However, some of the proposed features proved to be too difficult or time consuming to engineer and were cut by senior management before completion.

## G. Suzuki

20 Suzuki Digital and Suzuki IP were projects to develop a digital and an Internet protocol (IP) wireless telephone interface card, respectively, for a cordless \*20 telephone. ESI purchased the handset and base station for the cordless telephone from Uniden, a third-party manufacturer of telecommunications equipment. However, ESI did not purchase the interface card (which goes in the base station) from Uniden. Instead, ESI's engineers designed the hardware and wrote the

software for both the digital and IP interface cards. Had ESI purchased the interface cards from Uniden, the cordless telephone would have been unable to access many of the features of ESI's phone system; it would have had the limited functionality of an analog telephone.

## H. Phoenix

Phoenix was the codename for a project to develop a 256-port phone system. The largest system that ESI had developed before Phoenix supported only 128 ports. Phoenix was ESI's first phone system that (1) used more than one cabinet, (2) had a backplane, and (3) could handle more than seven port cards.

Senior management spent much time discussing how to handle the increasing computing demands of a 256-port phone system. They ultimately decided to use a Motorola ColdFire 5407 processor in the Phoenix, a processor that ESI had not used before in any of its products. The ColdFire 5407 was a relatively new processor at the time, and little information about it was available on the Internet. ESI's engineers made extensive use of Motorola's data sheets and \*21 received help from an electrical engineer at Motorola to incorporate the ColdFire 5407 into the Phoenix. ESI also switched from Analog Devices DSPs to higher-speed Texas Instruments DSPs in the Phoenix to handle the increased traffic on the backplane.

## I. Pony

Pony was the first codename given to a series of projects to develop the ESI50, a full-featured 50-port phone system. In the Pony project, senior management planned to switch from an embedded system to the Linux operating system. However, the switch proved to be more difficult than anticipated. ESI discovered that its call processing software did not work on the Linux operating system and that its port-loop architecture to handle voicemail was incompatible with Linux's data file system. Midway through development senior management made a calculated decision to abandon the Pony project. ESI ultimately developed the ESI50 using a proprietary embedded system.

## J. DLC0

The DLC0 was a port card for the Phoenix phone system. ESI developed the DLC0 as an optional configuration of the DLC12 with a lower cost. The DLC12 supported up to 12 telephones, in addition to other equipment. ESI depopulated the DLC12 to create the DLC0.

\*22 However, creating the DLC0 involved more than simply removing parts from the DLC12. When parts are removed from a circuit board, the power supply can go into a hiccup-type oscillation because of the reduced load. Furthermore, removing parts creates unterminated traces. This causes power going to the traces to bounce back. ESI's hardware engineers had to resolve these and other issues in designing the DLC0. Afterward, ESI's firmware engineers had to write new firmware for the DLC0 because the firmware for the DLC12 would not have worked for the DLC0.

## K. DLC82

The DLC82 was a port card for the ESI50 phone system. The DLC82 supported T-1 trunks, eight digital telephones, and two analog telephones. Tim Hoth, a senior hardware engineer at ESI, designed the DLC82 to be roughly 30% smaller in size than the DLC12 and the DLC0 so that it could fit into the ESI50 cabinet. One of the challenges he faced was maintaining signal integrity. The smaller form factor of the DLC82 required him to carefully position the components and traces on the board to avoid interference and power spikes, which can manifest themselves as humming or warbling.

## L. IVC1212

The IVC1212 was a port card for the Phoenix phone system. It was ESI's first card that supported 12 IP phone trunks and 12 ESI-Link trunks. During the development of the IVC1212 card, ESI was shifting from 5-volt components to 3.3-volt components. The IVC1212 was designed with some 5-volt components and some 3.3-volt components that were tolerant of 5 volts. The components on the IVC1212 were entirely surface mounted, which represented a change from the "through-hole" mounting on previous boards. ESI also switched from a Hitachi 8-bit microcontroller to a ColdFire processor and from 8 MHZ DSPs to 20 MHZ DSPs.

## IV. Computation of the Research Tax Credit

On May 23, 2003, ESI signed a "proposal to serve" with Alliantgroup, LP (Alliantgroup), to perform a "research and development tax credit study" (R&D study). Alliantgroup then performed an R&D study for 1999 to 2002. As part of the R&D study, Alliantgroup created a spreadsheet listing the employees at ESI that performed qualified services, the employees' titles, the percentage of time that each employee spent performing qualified services, and the employees' wages reported on Forms W-2, Wage and Tax Statement. Alliantgroup looked at the \*24 roles and responsibilities of each employee and consulted with senior management in making the percentage allocations.

Alliantgroup provided a report to ESI at the conclusion of the R&D study. The report contained nine parts: (1) an executive summary; (2) an overview of the approach Alliantgroup used to conduct the R&D study; (3) an overview of ESI; (4) the biographies of senior management and a few other ESI executives; (5) an overview of the research tax credit; (6) an overview of the procedures Alliantgroup used to perform the R&D study; (7) an overview of ESI's research and development management process; (8) an analysis of ESI's research and development activities; and (9) the calculations of ESI's research tax credits for 1999 to 2002.<sup>[9]</sup>

Mr. Suder and Mr. Boyd had little involvement in the R&D study. Alliantgroup worked primarily with Mr. Wende. Mr. Wende viewed the time he spent with Alliantgroup as a learning experience. After working with Alliantgroup on the R&D study, he felt that he understood how to compute ESI's research tax credit going forward. And he was well suited for that task. As the senior vice president of product operations from 2004 to 2006 and the senior vice \*25 president of product development in 2007, he had to lead the product development teams at ESI. He worked with many of the employees at ESI who regularly performed qualified services and was familiar with their roles and responsibilities and the types of projects that they worked on. For those employees that he did not know as well, he spoke either with them directly or with their supervisors before making percentage allocations.

For each of the years at issue Mr. Wende prepared a spreadsheet listing each employee that received an allocation and his or her allocation. In determining an employee's allocation, Mr. Wende counted the time that the employee spent discussing ideas for new products, researching new products and features, writing specifications, designing new products, building prototypes, testing prototypes, repairing bugs and defects in prototypes, writing software, working on the alpha and beta tests, and doing similar activities. If the employee had worked at ESI in the prior year, Mr. Wende used the prior year's allocation as a starting point and considered whether the employee's role had changed since the prior year.

Mr. Wende believed that 80% would have been an appropriate allocation for Mr. Suder for 2004-07 to reflect Mr. Suder's role as the creative genius behind product development at ESI. Unlike typical CEOs, Mr. Suder spent most of his time steering product development at ESI from the idea generation stage all the \*26 way through alpha testing. Mr. Suder did spend some time, though, working with Mr. Boyd on the business aspects of ESI. And so, in a measure of conservatism, Mr. Wende decided to allocate 75% of Mr. Suder's time to qualified services for 2004-07 to avoid the application of the "substantially all" rule. See *infra* pp. 54-55.

Mr. Wende allocated 25% of Mr. Boyd's time to qualified services for 2004-07. Mr. Boyd spent most of his time running ESI, but he contributed to the senior product strategy meetings and followup product meetings, reviewed product specifications, and researched networking technology and how to incorporate that technology into ESI's products.

Mr. Wende gave himself a 100% allocation for 2004-07. Though Mr. Wende's role was to supervise the engineering groups, the product assurance lab, and the test technicians, he did not act as a high-level supervisor. He spent his time "down in the trenches", interacting with employees regularly, giving them guidance, receiving their feedback, answering questions, and the like. Mr. Hansen also received a 100% allocation for 2004-07 for his role as ESI's chief architect of new products.

Mr. Wende gave ESI's engineers, product managers, and product testers 100% allocations for the most part. However, Mr. Wende did not count \*27 maintenance work as time spent on qualified services, and so he gave lower allocations to those employees that performed maintenance more than sporadically. Mr. Wende gave some employees at ESI small allocations, generally 5% or 10%, if they spent a small amount of time assisting with new product development.<sup>[10]</sup> These employees generally had roles that did not directly relate to new product development, such as quality control or shipping and handling. However, because ESI was a relatively small company, from time to time employees were given assignments outside of their normal duties. For example, quality control employees often assisted with the alpha and beta tests.

After Mr. Wende finished making his percentage allocations for ESI's employees, he provided his spreadsheet to ESI's accounting department, who then entered the employees' wages and totaled up the wages for qualified services. ESI reported wages for qualified services of \$9,650,761 for 2004, \$8,877,903 for 2005, \$8,728,067 for 2006, and \$11,994,452 for 2007 on Form 6765, Credit for Increasing Research Activities. Wages for qualified services accounted for more than 95% of the QREs that ESI reported for the years at issue.

- 28 \*28 In addition to wage QREs, ESI reported expenses of \$236,846 for 2004, \$164,241 for 2005, \$109,816 for 2006, and \$182,711 for 2007 for supplies used in the conduct of qualified research. These expenses included payments to (1) Alta Via for gerber files, (2) Arrow Electronics for electronic components used in prototypes, (3) Avnet Electronics for materials used to assemble circuit boards, and (4) GTECH for manufacturing prototype boards. Supply expenses were charged by Mr. Wende to an account which was used exclusively for research and development supplies. ESI also reported contract research expenses of \$29,915 for 2004, \$15,531 for 2005, \$7,755 for 2006, and \$10,316 for 2007. ESI paid these amounts to two law firms for patent research and patent prosecution.

## V. Mr. Suder's Compensation

In ESI's early days Mr. Suder worked 60 to 80 hours per week. However, during the years at issue he worked around 20 to 30 hours per week. His work schedule varied a lot from week to week. Some weeks he came into the office almost every day. Other weeks he came in only once or twice. He devoted a lot of his time to nonprofits in the Dallas area that were unaffiliated with ESI.

- 29 Mr. Suder was ESI's most highly compensated employee. He received wages of \$8,674,815 for 2004, \$10,954,175 for 2005, \$10,548,022 for 2006, and \$10,502,584 for 2007. In contrast, Mr. Boyd, ESI's second most highly \*29 compensated employee, received wages of \$934,919 for 2004, \$1,354,553 for 2005, \$1,308,926 for 2006, and \$1,304,776 for 2007. Mr. Suder's and Mr. Boyd's wages comprised a base salary and bonuses. The bonuses were based on factors that included ESI's growth, overall value, and cashflow. The record does not contain a numerical breakdown of their base salaries and bonuses for any of the years at issue. Mr. Suder's wages made up the largest component of ESI's wages for qualified services at roughly two-thirds of the total dollar amount for each of the years at issue.

## VI. Tax Return Preparation

Margaret A. Rogers, certified public accountant (C.P.A.), of the firm Rogers and Rogers Certified Public Accountants prepared ESI's Forms 1120S and Mr. Suder's Forms 1040 for 2004-07.<sup>[11]</sup> Ms. Rogers has been Mr. Suder's accountant for more than two decades, dating back to the years before ESI's formation. Ms. Rogers began working part time as an accountant when she was in high school. She received a bachelor of science degree in accounting from Rollins College in 1975. In 1985 she became a licensed C.P.A. in Texas. She retired from practice in June of 2009.

- 30 \*30 During the years at issue Ms. Rogers visited ESI's premises once a month and met with Mr. Boyd, Mike Griffin (ESI's controller and a C.P.A. himself), and staff accountants within ESI's accounting department.<sup>[12]</sup> Ms. Rogers reviewed ESI's financial statements with them and answered any questions that they had. ESI's financial statements were separately audited by the accounting firm Deloitte & Touche (Deloitte).

ESI's accounting department provided Ms. Rogers with schedules containing all of the information that she needed to complete ESI's Forms 6765 for 2004-07. Included among the schedules were the wage QRE spreadsheets that Mr. Wende had created. Ms. Rogers had no reason to question the numbers on the schedules because she had been through 12 monthly meetings at ESI and Deloitte had completed its audit of ESI's financial statements by the time she had received the schedules.

- 31 \*31 **OPINION**

## I. Burden of Proof

We begin with the burden of proof. The Commissioner's determinations in a deficiency notice are generally presumed correct, and taxpayers bear the burden of proving otherwise. Rule 142(a); Welch v. Helvering, 290 U.S. 111, 115 (1933). Tax credits are a matter of legislative grace, and taxpayers bear the burden of proving they are entitled to claim tax credits. See, e.g., INDOPCO, Inc. v. Commissioner, 503 U.S. 79, 84 (1992); New Colonial Ice Co. v. Helvering, 292 U.S.

435, 440 (1934). The burden of proof may shift to the Commissioner if the taxpayers prove that they have satisfied certain conditions. See sec. 7491(a); Higbee v. Commissioner, 116 T.C. 438, 442-443 (2001). Petitioners have neither claimed nor shown that they complied with the requirements of section 7491(a). Accordingly, the burden of proof remains with petitioners. See Rule 142(a).

## II. General Rules

Section 41(a)(1) allows a taxpayer a credit against income taxes in an amount equal to 20% of the excess, if any, of the taxpayer's qualified research expenses (QREs) for the taxable year (credit year) over the base amount.<sup>[13]</sup> QREs<sup>\*32</sup> are defined as the sum of a taxpayer's in-house research expenses and contract research expenses which were paid or incurred by the taxpayer during the credit year in carrying on a trade or business. Sec. 41(b)(1). The base amount is defined as the product of the fixed-base percentage and the average annual gross receipts of the taxpayer for the four years preceding the credit year. Sec. 41(c)(1). However, the base amount may not be less than 50% of the QREs for the credit year. Sec. 41(c)(2).

The fixed-base percentage is generally the lesser of 16% or the percentage that the aggregate QREs of the taxpayer for certain years (base period) is of the<sup>\*33</sup> aggregate gross receipts of the taxpayer for those years. Sec. 41(c)(3)(A) and (C). ESI computed its research tax credit using a fixed-base percentage of 16%, the maximum under the statute, for each of the years at issue.<sup>[14]</sup>

A taxpayer must determine its QREs to be taken into account in computing its fixed-base percentage "on a basis consistent with" its determination of QREs for the credit year (the consistency requirement). Sec. 41(c)(6).<sup>[15]</sup> In his pretrial memorandum, respondent raised the consistency requirement, contending that petitioners must provide evidence as to the correct amount of ESI's base period QREs to substantiate the research tax credits claimed. Neither petitioners nor respondent addressed the consistency requirement or ESI's base period QREs in the opening or reply briefs. In their first supplemental brief, petitioners invite the Court's attention to Trinity Indus., Inc. v. United States, 757 F.3d 400 (5th Cir. 2014), aff'd in part, vacating in part, and remanding 691 F. Supp. 2d 688 (N.D. Tex. 2010), and suggest that we should allow ESI to adjust its base period QREs if we determine that ESI's QREs for the credit years were overstated. Respondent<sup>\*34</sup> argues in his first supplemental brief that petitioners have waived the application of the consistency rule.

Rule 151(e) governs the content of briefs and requires that all briefs state, among other things, the nature of the controversy, the issues to be decided, proposed findings of fact, points on which a party relies, points of law involved, and disputed questions of fact. Neither party has adequately briefed the consistency requirement in accordance with Rule 151(e). Accordingly, we find that both parties have conceded any arguments they might have with respect to the consistency requirement. See Petzoldt v. Commissioner, 92 T.C. 661, 683 (1989); Money v. Commissioner, 89 T.C. 46, 48 (1987). Moreover, there is insufficient evidence in the record for us to compare the projects undertaken by ESI during the base period with the 12 stipulated projects.

Petitioners' entitlement to the research tax credits turns on whether ESI incurred QREs during the years at issue. As previously stated, QREs are defined as the sum of a taxpayer's in-house research expenses and contract research expenses. Sec. 41(b)(1). As relevant here, in-house research expenses are the wages paid or incurred in relation to an employee for qualified services performed by the employee and the amounts paid or incurred for supplies used in the conduct<sup>\*35</sup> of qualified research.<sup>[16]</sup> Sec. 41(b)(2)(A)(i) and (ii). Qualified services, in turn, are defined as services consisting of engaging in qualified research or engaging in the direct supervision or direct support of research activities which constitute qualified research. Sec. 41(b)(2)(B). Contract research expenses are equal to 65% of the amounts paid or incurred by the taxpayer in relation to a person other than an employee of the taxpayer for qualified research. Sec. 41(b)(3). Therefore, to be eligible for a credit under section 41(a)(1), petitioners must prove that ESI performed qualified research, or paid someone else to perform qualified research, during the years at issue.

## III. The Four Tests for Qualified Research

Qualified research is research that satisfies four tests. First, expenditures connected with the research must be eligible for treatment as expenses under section 174 (the section 174 test). Sec. 41(d)(1)(A). Second, the research must be undertaken for the purpose of discovering technological information (the technological information test).<sup>[17]</sup> Sec. 41(d)(1)(B)(i). Third, the taxpayer must<sup>\*36</sup> intend that the information to be discovered be useful in the development of a new or improved business component of the taxpayer (the business component test). Sec. 41(d)(1)(B)(ii). Fourth,

substantially all of the research activities must constitute elements of a process of experimentation for a purpose relating to a new or improved function, performance, reliability, or quality (the process of experimentation test). Sec. 41(d)(1)(C), (3).

The above tests are applied separately to each business component. Sec. 41(d)(2)(A). A "business component" is defined as a product, process, computer software, technique, formula, or invention that the taxpayer holds for sale, lease, or license or uses in its trade or business. Sec. 41(d)(2)(B). If a business component as a whole fails the qualified research tests, we may apply the \*37 "shrinking-back rule", which allows us to apply the qualified research tests to a subset of the business component if doing so will allow the subset to satisfy those tests. Sec. 1.41-4(b)(2), Income Tax Regs. The shrinking-back rule provides that if the qualified research tests are not satisfied at the level of the discrete business component, they are then applied to the most significant subset of elements of the business component. The shrinking-back continues until either a subset of the business component satisfies the tests or the most basic element of the business component is reached and fails to satisfy the tests. Id. The shrinking-back rule applies only if the overall business component does not satisfy the qualified research tests set out in section 41(d)(1) and is not itself a reason to exclude activities from credit eligibility. Id.

Certain types of research are specifically excluded from the definition of qualified research. They include research conducted after the beginning of the commercial production of a business component, research related to the adaption of an existing business component to a particular customer's requirement or need, foreign research, research in the social sciences, arts, or humanities, and funded research. Sec. 41(d)(4). Furthermore, research relating to style, taste, cosmetic, or seasonal design factors is not a qualified purpose under the process of experimentation test and is thus not qualified research. Sec. 41(d)(3)(B).

### \*38 **A. The Section 174 Test**

The section 174 test requires that expenditures connected with the research activities be eligible for treatment as expenses under section 174. Section 174 provides alternative methods of accounting for "research or experimental expenditures" that taxpayers would otherwise capitalize. Sec. 1.174-1, Income Tax Regs. The regulations define "research or experimental expenditures" as "expenditures incurred in connection with the taxpayer's trade or business which represent research and development costs in the experimental or laboratory sense." Sec. 1.174-2(a)(1), Income Tax Regs. It is clear that the 12 projects were incurred in connection with ESI's trade or business.

As relevant here, an activity is "research and development \* \* \* in the experimental or laboratory sense" if: (1) The information available to the taxpayer does not establish the capability or method for developing or improving a product or process or the appropriate design of a product or process (i.e., an uncertainty exists); and (2) the activity is intended to discover information that would eliminate this uncertainty. Sec. 1.174-2(a)(1) and (2), Income Tax Regs. Because the taxpayer need only be uncertain as to "the capability or method \* \* \* or the appropriate design" (emphasis added) of the improvement, an uncertainty may exist even if the taxpayer knows that it is technically possible to achieve a goal but \*39 is uncertain of the method or appropriate design to use to reach that goal. Sec. 1.174-2(a)(1), Income Tax Regs. Whether an uncertainty exists is an objective test that depends on the information available to the taxpayer. Union Carbide Corp. & Subs. v. Commissioner, T.C. Memo. 2009-50, slip op. at 195-196 (citing Mayrath v. Commissioner, 41 T.C. 582, 590-591 (1964), aff'd, 357 F.2d 209 (5th Cir. 1966)), aff'd, 697 F.3d 104 (2d Cir. 2012). These guidelines apply to the nature of the activity examined, not the nature of or the level of technological advancement represented by the product or process. Sec. 1.174-2(a)(1) and (2), Income Tax Regs.<sup>[18]</sup>

Respondent argues that petitioners introduced "very little evidence that showed uncertainty regarding the capability, method, or appropriate design of the [12] projects as of the beginning of ESI's product-development activities." Respondent argues that petitioners instead introduced "evidence that showed ESI encountered uncertainty that was inherent in every large development effort", including uncertainty resulting from deadlines, lack of resources, unexpected delays, and human error.

\*40 Respondent relies heavily on the testimony of his expert, Charles Jackson. Dr. Jackson received a Ph.D. degree in electrical engineering from the Massachusetts Institute of Technology. His area of expertise is in the telecommunications industry. We evaluate an expert's opinion in the light of all the evidence in the record, and we may accept or reject the expert's opinion, in whole or in part, according to our independent evaluation of the evidence in the record. See Helvering v. Nat'l Grocery Co., 304 U.S. 282, 295 (1938); Estate of Davis v. Commissioner, 110 T.C. 530, 538 (1998); Zarlengo v. Commissioner, T.C. Memo. 2014-161, at \*42; Acuity v. Commissioner, T.C. Memo. 2013-209, at \*84. We find Dr. Jackson's expert opinion to be faulty in a number of respects and, accordingly, accord it little weight.

Dr. Jackson states in his expert report that "[h]alf of the projects created products that merely matched products already available from other vendors. I identified no technical challenge in those projects that would require resolving uncertainty through experimentation." He further states that "ESI's strength is building low-cost, easy-to-use telephone systems that match products introduced earlier by industry leaders such as Avaya and Cisco." However, Dr. Jackson offers no factual basis in his report for these assertions. In fact, he did not compare a single circuit board designed by

41 Avaya or Cisco to a board designed by \*41 ESI's hardware engineers, or a single line of software code written by Avaya or Cisco to code written by ESI's software engineers.

Throughout his expert report, Dr. Jackson characterizes ESI's research and development activities as routine. For example, he describes Arcadia, Clark Kent, and Rio Grande as routine software development, Suzuki and DLC82 as routine projects, and the vast majority of the features in Express FSII as routine programming tasks. Dr. Jackson testified that he classified projects as routine or nonroutine on the basis of his knowledge of English.

Many statements in Dr. Jackson's report are contradicted by credible evidence in the record. For example, Dr. Jackson insinuates that ESI could have downloaded Linux Code straight from the Internet to use in the Mad Max project. However, Mr. Wende credibly testified that ESI's hardware would not have worked on the Linux operating system without significant and time-consuming changes. Dr. Jackson states that adding two analog phone lines to the DLC82 was a "simple" task. However, Mr. Hoth credibly testified that the analog phone lines created problems with noise and current spikes that proved to be especially challenging to handle in light of the DLC82's small form factor. Dr. Jackson states that the IVC1212 project "was little more than a repackaging and rearranging of earlier designs." However, Mr.

42 Hoth credibly testified as to the \*42 many new features on the IVC1212 port card, including 3.3-volt components, surface-mounted parts, a ColdFire processor, and 20 MHZ DSPs. In short, we find Dr. Jackson's expert report to be unreliable.

Petitioners argue that "ESI provided the Court testimonial and documentary evidence of the numerous technical uncertainties it faced in building exponentially larger phone systems than it had ever attempted, adding innovative and improved software features, and incorporating the new and different technological hardware components needed to stay competitive." Petitioners further argue that "[e]very single one of these identified uncertainties was of a type specifically contemplated by Section 41 of the Internal Revenue Code and thus eligible for consideration in ESI's credit calculation." We agree with petitioners that uncertainties as to capability, method, or appropriate design were present in all 12 projects.

Each of the 12 projects began as an idea to develop a new hardware product, software product, or both. Senior management vetted the ideas in the senior product strategy meetings and followup meetings. ESI's product managers, engineers, technicians, and other employees then transformed the ideas into commercially ready products.<sup>[19]</sup> Neither

43 senior management nor anyone else at ESI \*43 had information detailing the exact steps to create the products or their ultimate design. Moreover, because the products were all proprietary, publicly available information of that type did not exist.

The record contains extensive evidence of the uncertainties present in each of the 12 projects. The following table lists one or more uncertainties in capability, method, or design specific to each of the 12 projects:

| *44 Project  | Uncertainty                                                                          |
|--------------|--------------------------------------------------------------------------------------|
| Arcadia      | Adding ACD reporting to ESI's phone systems                                          |
| Chameleon    | Incorporating a third party skinning tool                                            |
| Clark Kent   | Extracting statistical information from Pink Panther                                 |
| Rio Grande   | Creating an application in Microsoft's .NET framework to program an ESI phone system |
| Mad Max      | Transferring phone calls through hotel routers and firewalls                         |
| Express FSII | Adding new features such as live ring call waiting and ACD auto wrap                 |
| Suzuki       | Creating wireless telephone interface cards                                          |

|         |                                                                                    |
|---------|------------------------------------------------------------------------------------|
| Phoenix | Connecting two cabinets; adding a backplane; integrating a ColdFire 5407 processor |
| Pony    | Developing a 50 port phone system running Linux                                    |
| DLC0    | Isolating power; terminating traces                                                |
| DLC82   | Maintaining signal integrity on a small circuit board                              |
| IVC1212 | Switching to 3.3 volt parts; surface mounting parts                                |

On the basis of the foregoing, we conclude that all 12 projects satisfy the section 174 test.

## B. The Technological Information Test

The technological information test requires that the research be undertaken for the purpose of discovering information that is "technological in nature". Sec. 41(d)(1)(B)(i). Information is "technological in nature" if it "fundamentally relies on principles of the physical or biological sciences, engineering, or computer \*45 science". H.R. Conf. Rept. No. 99-841 (Vol. II), at II-71 through II-72 (1986), 1986-3 C.B. (Vol. 4) 1, 71-72. Respondent does not dispute that the 12 projects satisfy the technological information test.

## C. The Business Component Test

The business component test requires that the taxpayer intend that the information to be discovered be useful in the development of a new or improved business component of the taxpayer. Sec. 41(d)(1)(B)(ii). To be useful within the meaning of this test, the research need only provide some level of functional improvement to the taxpayer. Norwest Corp. & Subs. v. Commissioner, 110 T.C. 454, 495 (1998). Respondent does not dispute that the 12 projects satisfy the business component test.

## D. The Process of Experimentation Test

The process of experimentation test has three elements: (1) substantially all of the research activities must constitute (2) elements of a process of experimentation (3) for a qualified purpose. Sec. 41(d)(1)(C). The "substantially all" element means that 80% or more of the taxpayer's research activities for each business component, measured on a cost or other consistently applied reasonable basis, must constitute a process of experimentation for a qualified purpose. Norwest Corp. & Subs. v. Commissioner, 110 T.C. at 497; sec. 1.41-4(a)(6), \*46 Income Tax Regs. A taxpayer does not fail this requirement even if the remaining 20% (or less) of its research activities with respect to the business component do not constitute elements of a process of experimentation for a purpose described in section 41(d)(3) as long as the remaining research activities satisfy the requirements of section 41(d)(1)(A) (the section 174 test) and are not otherwise excluded under section 41(d)(4). Sec. 1.41-4(a)(6), Income Tax Regs. If a business component fails the process of experimentation test because of the "substantially all" requirement, we may apply the shrinking-back rule, discussed above, until an element that satisfies the test is reached. Norwest Corp. & Subs. v. Commissioner, 110 T.C. at 497.

A process of experimentation is "a process designed to evaluate one or more alternatives to achieve a result where the capability or the method of achieving that result, or the appropriate design of that result, is uncertain as of the beginning of the taxpayer's research activities." Sec. 1.41-4(a)(5)(i), Income Tax Regs.

A process of experimentation must fundamentally rely on the principles of the physical or biological sciences, engineering, or computer science and involves the identification of uncertainty concerning the development or improvement of a business component, the identification of one or more alternatives intended to eliminate that uncertainty, and the identification and the conduct of a process of evaluating the alternatives (through, for example, modeling, simulation, or a systematic trial and error methodology).

\* \* \* [Id.]

\*47 Respondent argues that "[p]etitioners have shown that ESI chose among design alternatives by applying engineering know-how, publicly available knowledge, or by committee. These methods are not processes of experimentation as required by \* \* \* [section] 41." Petitioners argue that

ESI clearly had in place a very detailed, multi-level, systematic process for development of all facets of its phone systems which involved 1) conceptually hypothesizing how numerous technical alternatives might be used to develop new and improved phone systems, 2) testing these alternative in a scientific manner, 3) analyzing the results, 4) refining the initial hypothesis or discarding it for another if necessary, and 5) repeating the same, if necessary.

We agree with petitioners that ESI used a process of experimentation to resolve uncertainties in all 12 projects.

Contrary to respondent's argument, publicly available knowledge describing the appropriate design of the products being designed in the 12 projects did not exist. ESI's hardware engineers consulted data sheets, design manuals, application notes, field service engineers, and online materials for general information on components. ESI's software engineers, in particular the GUI engineers, researched general code design. The hardware and software engineers then applied their knowledge of engineering and computer science, respectively, to create an appropriate design for the products.

48 \*48 Respondent has not raised any persuasive distinction between principles of engineering (which a process of experimentation may rely on under section 1.41-4(a)(5)(i), Income Tax Regs.) and "engineering know-how". Many of ESI's engineers came from well-respected companies such as Texas Instruments and Raytheon and brought with them a great deal of knowledge. They applied this knowledge, and the institutional knowledge of ESI, in the design of new products. Neither section 41 nor the regulations thereunder require taxpayers to "reinvent the wheel". The vast amount of planning, testing, and bug fixing documentation in the record establishes that ESI did not know the appropriate design of any of the 12 products at the outset. Rather, ESI used the methodical product development process described supra pp. 8-15 to design the products.

The process began with concept development in the senior product strategy meetings and followup meetings. At these meetings senior management discussed high-level ideas for new products and selected the major components to be used in the new products. Respondent argues that senior management chose appropriate designs by committee at these meetings, an argument reminiscent of that made by the Government in Trinity Indus., Inc., 691 F. Supp. 2d at 692.

49 In Trinity Indus., the Government argued that Trinity's design work integrating extant subassemblies into a ship design was "nothing more than \*49 ordering off a menu". Id. The District Court found that the Government's argument "greatly oversimplifies the process." Id. The District Court reasoned that the systems in the ships had considerable flexibility in their configuration and that determining the appropriate configuration could involve a significant research effort. Id. Moreover, the systems interacted with each other, sometimes in complex and nonintuitive ways. Id.

Like the ship systems in Trinity Indus., the major components selected by ESI's senior management do not function in isolation. They interact with each other and with many other components, such as resistors, capacitors, and transistors, on a circuit board. Determining the appropriate configuration of the components involved a considerable research effort. ESI's hardware engineers spent an average of two to six weeks just on developing a schematic for a circuit board.

50 ESI's hardware engineers used both a systematic trial and error process and a modeling process to design prototypes. They worked closely with Alta Via to create gerber files for every schematic. Gerber files are a computer-generated representation of the components on a circuit board and the traces between them. After GTECH manufactured prototypes from the gerber files, the hardware \*50 engineers performed a number of tests on them to measure signals, frequencies, voltages, etc.

ESI's software engineers likewise used a systematic trial and error process. They were given specifications or general project requirements and used principles of computer science to write the corresponding code. They wrote snippets of code, tested the code, made adjustments as necessary, retested the code, and continued this iterative process until the code performed its intended function.

51 In United Stationers, Inc. v. United States, 163 F.3d 440, 446 (7th Cir. 1998), the Court of Appeals rejected the taxpayer's argument that its software development involved a process of experimentation. The taxpayer in that case purchased a commercially available software package and modified the software in eight separate projects to create eight separate, but related, software programs suited to its particular needs. Id. at 441. The Court of Appeals found that the eight projects had no technical uncertainty from the outset. Id. at 446. Similarly, in Norwest Corp. & Subs. v. Commissioner, 110 T.C. at 526, the taxpayer made software changes to its money transfer system to satisfy regulatory and business requirements. This Court found that there was no evidence of uncertainty about the taxpayer's ability to complete the project, which "merely required conducting \*51 good coding and eliminating bugs through testing—issues resolved through cookbook approaches and skilled practice, not research and experimentation." Id.

We find United Stationers and Norwest Corp. to be distinguishable from the instant case. Unlike the projects in United Stationers and Norwest Corp., which involved modifications to existing software programs, the 12 projects in these cases involved the development of new software, which was either layered on top of newly developed hardware or which added features or functionality to ESI's phone systems (except for the Chameleon project, as discussed *infra* p. 53). The projects in United Stationers and Norwest Corp. had associated business risks but no technical uncertainty. On the other hand, we find that all 12 projects had uncertainty as to capability, method, or design. See *supra* pp. 43-44. Moreover, none of the software that ESI developed operated as a stand-alone program. Instead, the software was designed to operate in conjunction with ESI's proprietary phone systems.

The hardware and software that ESI developed was extensively tested by ESI's product assurance lab, alpha tested by ESI's engineering department, and beta tested by willing beta testers. ESI's hardware and software engineers reproduced bugs that were found during testing, fixed them in order of priority, <sup>\*52</sup> and returned the hardware and software to be retested. The engineers continued fixing bugs in products that were available for sale to the public.

Respondent argues that "debugging activities performed on products used by customers are specifically excluded from the definition of 'qualified research' under \* \* \* [section] 41(d)(4)(A), the research after commercial production exclusion." We agree with respondent that fixing hardware and software bugs in ESI's products that were ready for commercial sale or use or that met ESI's basic functional and economic requirements for sale or use is not qualified research. See sec. 1.41-4(c)(2)(i), Income Tax Regs. However, on the basis of the record, we find that less than 20% of the activities with respect to each of the 12 projects were fixing bugs in such products. See *id.* para. (a)(6). We find that 80% or more of the activities with respect to each of the 12 projects constituted elements of a process of experimentation. See *id.*

We find that the experimentation undertaken with respect to 11 of the 12 projects was for a qualified purpose. A qualified purpose is a purpose that relates to a new or improved function, performance, reliability, or quality. Sec. 41(d)(3)(A). Arcadia, Clark Kent, Mad Max, Express FSII, Suzuki, Phoenix, Pony, DLC0, DLC82, and IVC1212 were undertaken to add a new feature or function to ESI's phone systems. Rio Grande was undertaken to improve the <sup>\*53</sup> PC-based application that was used to program the phone system by redesigning it to work on Microsoft's .NET framework. These 11 projects were undertaken for a qualified purpose.

Chameleon, however, was not. It was undertaken to change the look and feel of the VIP user interface. It gave a user the ability to change the colors, fonts, button shapes, and button sizes on the screen. Mr. Wende credibly testified that Chameleon did not change the functionality of the VIP suite. We find that Chameleon was undertaken for style, taste, or cosmetic purposes. See sec. 41(d)(3)(B). Accordingly, it was not undertaken for a qualified purpose and is thus not qualified research.

## E. Conclusion Regarding Qualified Research

We find that 11 of the 12 projects satisfy the four-part test for qualified research. Chameleon is the only project that does not. As previously mentioned, for purposes of section 41(d), the parties stipulated that the 12 projects are representative of the 76 projects undertaken by ESI during the years at issue for which it claimed QREs. See *supra* pp. 15-16. Accordingly, we find that 91.67% (eleven-twelfths) of the 76 projects constitute qualified research. We next address whether ESI substantiated its QREs for the years at issue.

## <sup>\*54</sup> IV. Substantiation of ESI's QREs

As previously mentioned, QREs are defined as the sum of a taxpayer's in-house research expenses and contract research expenses. Sec. 41(b)(1). In-house research expenses include the wages paid or incurred to an employee for qualified services performed by the employee and the amounts paid or incurred for supplies used in the conduct of qualified research. Sec. 41(b)(2)(A)(i) and (ii). If an employee has performed both qualified services and nonqualified services, only the amount of wages allocated to the performance of qualified services constitutes an in-house research expense. Sec. 1.41-2(d)(1), Income Tax Regs. If substantially all of the services performed by an employee during the taxable year consist of engaging in qualified research or engaging in the direct supervision or direct support of research activities which constitute qualified research, the term "qualified services" means all of the services performed by the employee during the taxable year. Sec. 41(b)(2)(B) (flush language). The "substantially all" threshold is satisfied with respect to an employee if the wages appropriately apportioned to qualified research services constitute at least 80% of the wages paid to or incurred by the taxpayer for the employee during the taxable year. Sec. 1.41-2(d)(2), Income Tax Regs.

55 \*55 The amount of wages properly allocable to qualified services is determined by multiplying the total amount of wages paid to or incurred for the employee during the taxable year by the ratio of the total time actually spent by the employee in the performance of qualified services for the employer to the total time spent by the employee in the performance of all services for the employer during the taxable year. *Id.* subpara. (1). Another allocation method may be used if the taxpayer demonstrates the alternative method is more appropriate. *Id.* The term "wages" for purposes of section 41 has the same meaning as used in section 3401(a). Sec. 41(b)(2)(D)(i). Under section 3401(a), the term "wages" means "all remuneration \* \* \* for services performed by an employee for his employer, including the cash value of all remuneration (including benefits) paid in any medium other than cash", subject to a number of exceptions not applicable here.

A taxpayer claiming a credit under section 41 must retain records in sufficiently usable form and detail to substantiate that the expenditures claimed are eligible for the credit. Sec. 1.41-4(d), Income Tax Regs. A taxpayer is not required to keep records in a particular manner so long as the records maintained substantiate his or her entitlement to the credit. Shami v. Commissioner, 741 F.3d 560, 567 (5th Cir. 2014), *affg* in part, *vacating* in part, and *remanding* T.C. Memo. 2012-78; see also T.D. 9104, 2004-1 C.B. 406, 408 ("[T]he 2001 proposed \*56 regulations do not contain a specific recordkeeping requirement beyond the requirements set out in section 6001 and the regulations thereunder.").

If a taxpayer can prove that its employees engaged in qualified services, the Court may estimate the expenses associated with those activities. See United States v. McFerrin, 570 F.3d 672, 679 (5th Cir. 2009); see also Shami v. Commissioner, 741 F.3d at 568 (stating that the rule of Cohan v. Commissioner, 39 F.2d 540, 543-544 (2d Cir. 1930), applies in the context of the section 41 research tax credit). The Court "should look to testimony and other evidence, including the institutional knowledge of employees, in determining a fair estimate." McFerrin, 570 F.3d at 679 (citing Fudim v. Commissioner, T.C. Memo. 1994-235). For the Cohan rule to apply, however, a reasonable basis must exist on which the Court can make an estimate. Williams v. United States, 245 F.2d 559, 560 (5th Cir. 1957); see also Shami v. Commissioner, 741 F.3d at 568-569.

Respondent argues that "petitioners neither substantiated the QREs claimed nor produced sufficient evidence for this Court to make reasonable estimates for QREs." Respondent contends, specifically, that "[p]etitioners failed to provide any nexus between the expenses claimed and qualified research activities, if any, performed." Petitioners argue that they introduced "sufficient and credible documentary and testimonial evidence to support the estimated percentages of \*57 time ESI's employees spent performing qualified services during the tax years at issue." We agree with petitioners.

ESI computed its wage QREs using the method described in section 1.41-2(d)(1), Income Tax Regs. Mr. Wende was charged with determining the percentages of time that each employee spent performing qualified services for 2004-07. He spent four days testifying on the witness stand, during which time we had ample opportunity to evaluate his credibility. We find Mr. Wende to be a highly credible and reliable witness. See Diaz v. Commissioner, 58 T.C. 560, 564 (1972) (stating that the process of distilling truth from the testimony of witnesses, whose demeanor we observe and whose credibility we evaluate, is the daily grist of judicial life).

During Mr. Wende's testimony, petitioners introduced, as Exhibit 445-P, a diagram displaying the employees for which ESI claimed wage QREs for 2004-07, the department or area in which each employee worked, and each employee's percentage allocations for 2004-07. Mr. Wende identified the employees on the diagram, described their roles and responsibilities, and explained how he determined their percentage allocations. It is clear to us from Mr. Wende's detailed testimony that he was intimately familiar with ESI's business and its employees.

58 \*58 Respondent argues, however, that Mr. Wende "lacked the tax or accounting educational background and experience to make accurate wage QRE percentage allocations required by \* \* \* [section] 41(b)." We disagree. ESI retained Alliantgroup to perform an R&D study for 1999 to 2002. As part of the R&D study, Alliantgroup looked at the roles and responsibilities of ESI's employees and consulted with senior management in making percentage allocations. Mr. Wende worked closely with Alliantgroup on the R&D study and learned a great deal from that experience. He modeled his spreadsheets for 2004-07 on those Alliantgroup had created for 1999-2002. We find that Mr. Wende had sufficient knowledge of the section 41 research tax credit to make appropriate percentage allocations.

Respondent argues that the facts in Shami v. Commissioner, T.C. Memo. 2012-78, are "directly analogous" to those in these cases. The sole issue in Shami was whether certain wages that Farouk Systems, Inc. (FS), paid to Mr. Shami and Mr. McCall, two executives of FS, qualified as research expenses for purposes of the research tax credit. *Id.*, slip op. at 2-3. The Commissioner argued that the taxpayers had "failed to adequately substantiate the wage allocations for Mr. Shami and Mr. McCall." *Id.* at 8. The taxpayers offered the testimony of Mr. Shami, Mr. McCall, and two FS employees to substantiate the wage allocations. *Id.* at 9. Several witnesses contradicted Mr. Shami's testimony, and no witnesses \*59 corroborated Mr. McCall's testimony. *Id.* We found the testimony of the two FS employees to be general, vague, and conclusory. *Id.* We further found the testimony of Mr. Shami, Mr. McCall, and the two FS employees to be self-serving

and unreliable. Id. We rejected their testimony and held that the record contained insufficient evidence on which we could estimate the appropriate wage allocations for Mr. Shami and Mr. McCall. Id. at 9-10.

The Court of Appeals affirmed this aspect of our decision in Shami, stating that the taxpayers "might have proven their case through testimony, but the Tax Court found the testimony they presented to be noncredible." Shami v. Commissioner, 741 F.3d at 567. We find the testimony petitioners presented in these cases, unlike the testimony in Shami, to be credible and reliable. In addition to Mr. Wende's credible testimony, petitioners offered on direct examination the credible testimony of Mr. Suder, Mr. Boyd, Mr. Hoth, Sam Weber,<sup>[20]</sup> and Jim Fathman,<sup>[21]</sup> to substantiate ESI's QREs for 2004-07. These witnesses testified in great detail as to their involvement in ESI's product development process. We \*60 find that their testimony corroborates Mr. Wende's testimony and supports their percentage allocations for 2004-07.

Respondent called eight former ESI employees as witnesses, including GUI engineer Amy Hutchinson, software engineer Steven Wootton, senior call processing engineer Steven Carson, senior hardware engineer Craig Kibby, hardware engineer Paul McGary, senior test engineer Derek Dickson, administrator Kimberly Nichols,<sup>[22]</sup> and chief architect Buzz Hansen. The testimony of these witnesses does not discredit the testimony of petitioners' witnesses. In fact, much of their testimony corroborates the testimony of petitioners' witnesses. Most notably, several of respondent's witnesses attested to the substantial role Mr. Suder played in product development. For example, Mr. McGary credibly testified that Mr. Suder controlled the look, feel, and user experience of ESI's products down to minute details such as the number and color of lights on a handset. Mr. Hansen credibly testified that Mr. Suder came up with brilliant ideas for new products, spearheaded the development of the VIP suite, and alpha tested products.

\*61 On the basis of Mr. Wende's credible testimony, the credible testimony of petitioners' other witnesses, the credible testimony of respondent's witnesses, and the documentary evidence in the record, we find that Mr. Wende's percentage allocations were a reasonable estimate of the percentages of time ESI's employees spent performing qualified services for 2004-07. See id. at 568, 571; McFerrin, 570 F.3d at 679; Cohan v. Commissioner, 39 F.2d at 543-544.

Wage QREs accounted for more than 95% of the QREs that ESI claimed for each of the years at issue. In addition to wage QREs, ESI claimed a small amount of QREs for supplies used in the conduct of qualified research and for contract research expenses. Respondent argues that petitioners failed to substantiate these QREs as well. We disagree.

Mr. Wende charged expenses for supplies relating to research and development to a single account. He credibly testified that the expenses in that account included, inter alia, payments to Alta Via for gerber files, Arrow Electronics for electronic components used in prototypes, Avnet Electronics for materials used to assemble circuit boards, and GTECH for manufacturing prototype boards. Mr. Wende credibly testified that the contract research expenses were paid to two law firms for patent research and patent prosecution. See sec. 1.174-2(a)(1), Income Tax Regs. ("The term [research or experimental \*62 expenditures] includes the costs of obtaining a patent, such as attorneys' fees expended in making and perfecting a patent application."). Petitioners introduced into evidence general ledgers for the supply expense account and for the contract research expenses. We find that petitioners have substantiated the supply QREs and contract research expenses.

## V. Mr. Suder's Compensation

In Driggs v. United States, 706 F. Supp. 20 (N.D. Tex. 1989), the District Court held that section 174 did not impose a reasonableness requirement as to the deductibility of research and development expenditures. Less than a year later, Congress added section 174(e) to the Code in the Omnibus Budget Reconciliation Act of 1989 (OBRA), Pub. L. No. 101-239, sec. 7110(d), 103 Stat. at 2325. The House report accompanying OBRA, H.R. Rept. No. 101-247, at 1203 n.12 (1989), 1989 U.S.C.C.A.N. 1906, 2673, explains that

the bill provides for a rule contrary to the holding in Driggs v. United States, 706 F. Supp. 20 (N.D. Tex. 1989). The committee intends that the reasonableness requirement under section 174 be parallel to the reasonable allowance requirement for salaries and other compensation under section 162(a)(1), in that amounts supposedly paid for research may be recharacterized as disguised dividends, gifts, loans, or other similar payments. The committee does not intend that the reasonableness requirement under section 174 be used to question whether or not research activities themselves are of a reasonable type or nature.

63 \*63 Under section 174(e) a taxpayer may deduct a research and development expenditure only to the extent that "the amount thereof is reasonable under the circumstances." The amount of an expenditure is reasonable if the amount would ordinarily be paid for like activities by like enterprises under like circumstances. Sec. 1.174-2(a)(6), Income Tax Regs.<sup>[23]</sup> Under section 162(a)(1) a taxpayer may deduct "a reasonable allowance for salaries or other compensation for personal services actually rendered". "The test of deductibility in the case of compensation payments is whether they are reasonable and are in fact payments purely for services." Sec. 1.162-7(a), Income Tax Regs.

Respondent challenges the reasonableness of Mr. Suder's wages as QREs under section 174(e). The question of reasonableness is one of fact that must be resolved on the basis of all of the facts and circumstances. Owensby & Kritikos, Inc. v. Commissioner, 819 F.2d 1315, 1323 (5th Cir. 1987), aff'g T.C. Memo. 1985-267. In Owensby, the Court of Appeals for the Fifth Circuit, to which an appeal in these cases would lie absent a stipulation to the contrary, see sec. 7482(b)(1)(A), (2), cited with approval the factors articulated in Mayson Mfg. Co. v. Commissioner, 178 F.2d 115, 119 (6th Cir. 1949), for determining the \*64 reasonableness of compensation: (1) the employee's qualifications; (2) the nature, extent and scope of the employee's work; (3) the size and complexities of the business; (4) a comparison of salaries paid with gross income and net income; (5) the prevailing general economic conditions; (6) comparison of salaries with distributions to stockholders; (7) the prevailing rates of compensation for comparable positions in comparable concerns; and (8) the salary policy of the taxpayer as to all employees.<sup>[24]</sup> Owensby & Kritikos, Inc. v. Commissioner, 819 F.2d at 1323. "No single factor is decisive of the question; rather the trial court must consider and weigh the totality of the facts and circumstances when making its decision." Id. We have considered all of the aforementioned factors and address those most pertinent to these cases.

## A. Mr. Suder's Qualifications and Work Duties

65 In 1987 Mr. Suder started ESI out of his garage as a one-person operation. He worked 60 to 80 hours per week in ESI's early years developing and marketing innovative products, including "Phone Bill" and "Roll Call". Though his official \*65 title was CEO, Mr. Suder did not perform the typical duties of a CEO. As ESI's "chief idea guy" and "product visionary", he spent most of his time driving product development. And he was highly proficient in that role. By 2004 he had transformed ESI into a successful company with 125 employees and nearly \$40 million in gross annual revenue.

Mr. Suder continued driving product development in 2004-07. However, he was semiretired by 2004 and worked an average of only 20 to 30 hours per week at ESI from 2004-07. He devoted a lot of his time to nonprofits in the Dallas area that were unaffiliated with ESI. While Mr. Suder's charitable endeavors are certainly to be admired, his part-time work schedule at ESI raises doubt as to the reasonableness of his compensation.

## B. Mr. Suder's Wages Relative to Stockholdings and Income

66 Mr. Suder was ESI's most highly compensated employee from 2004-07. Although ESI claimed QREs for approximately 40 engineers and many other employees, Mr. Suder's wages alone constituted roughly two-thirds of ESI's total wage QREs for 2004-07. Mr. Suder was paid wages of \$8,674,815 for 2004, \$10,954,175 for 2005, \$10,548,022 for 2006, and \$10,502,584 for 2007. In contrast, Mr. Boyd, ESI's second most highly compensated employee, was paid \*66 wages of \$934,919 for 2004, \$1,354,553 for 2005, \$1,308,926 for 2006, and \$1,304,776 for 2007.

Mr. Suder and Mr. Boyd were ESI's sole shareholders for 2004-07. Mr. Suder owned 90% of the shares of ESI, while Mr. Boyd owned the remaining 10%. ESI paid Mr. Suder and Mr. Boyd wages in ratios roughly proportionate to their ownership interests.<sup>[25]</sup> Moreover, their wages moved up and down in tandem from year to year. The same is not true for other ESI employees, including Mr. Hansen.<sup>[26]</sup> We must "scrutinize payments made to shareholder-employees who control \* \* \* [a] corporation, especially when these payments are in proportion to stockholdings."<sup>[27]</sup> Id. at 1325. Mr. Suder's wages were approximately 4-1/2 times, 6 times, 5-1/2 times, and 5-1/2 times ESI's ordinary business income (line 21 of \*67 Form 1120S) for 2004-07, respectively. Mr. Suder's high compensation relative to ESI's income suggests that his compensation was, at least in part, unreasonable. See id. at 1326.

## C. Mr. Suder's Wages as Research Expenses

Mr. Suder's wages comprised a base salary and bonuses. The bonuses were based on factors that included ESI's growth, overall value, and cashflow. Petitioners did not introduce into evidence any computations of Mr. Suder's wages or the numerical breakdown of his base salary and bonuses for any of the years at issue. There is no evidence in the

record that Mr. Suder's wages were tied to his contribution to research and development at ESI. We note, for example, that Mr. Suder's wages were significantly higher in 2004-07 than they had been in prior years, notwithstanding the fact that Mr. Suder was not named as an inventor on any new patent applications filed from 2004 to 2007.

## D. Mr. Suder's Wages Compared With the Wages of Other CEOs

Perhaps the most important factor in evaluating the reasonableness of Mr. Suder's compensation for 2004-07 is how it compares to the compensation paid by companies similar to ESI to CEOs similar to Mr. Suder for performing similar services. See *id.* at 1330; sec. 1.174-2(a)(6), Income Tax Regs. Each party called an expert witness to offer his opinion. We evaluate expert opinions in the light of \*68 all the evidence in the record, and we may accept or reject an expert's opinion, in whole or in part, according to our independent evaluation of the evidence in the record. See Helvering v. Nat'l Grocery Co., 304 U.S. at 295; Estate of Davis v. Commissioner, 110 T.C. at 538; Zarlengo v. Commissioner, at \*42; Acuity v. Commissioner, at \*84.

### 1. The Parties' Experts

Respondent offered expert testimony of Khalid Hafiz, Ph.D. Dr. Hafiz received a B.A. in economics from Utkal University, an M.A. in economics from Aligarh Muslim University, an M.S. in economics from the London School of Economics, and a Ph.D. in economics from Fordham University. He works as an in-house economist for the IRS. His areas of expertise are transfer pricing and valuation.

Petitioners offered expert testimony of Brent M. Longnecker. Mr. Longnecker received a B.A. in business administration and an M.B.A. from the University of Houston. He is the chairman and CEO of Longnecker & Associates. He has the following certifications and licenses: (1) Compensation Committee Certification (CCC), (2) Certified Compensation Professional (CCP), (3) Certified Benefits Professional (CBP), (4) Global Remuneration Professional (GRP), and \*69 (5) Certified Executive Compensation Professional (CECP). His areas of expertise are executive compensation and corporate governance.

### 2. Dr. Hafiz's Expert Opinion

Dr. Hafiz compared Mr. Suder to CEOs of companies with revenues in the \$40 million range and an SIC Code of 3661, Telephone and Telegraph Apparatus Industry, in the Economic Research Institute (ERI) database. Dr. Hafiz also relied on a CBIZ valuation study in his expert report, but he ultimately rejected that study at trial. Dr. Hafiz states in his expert report that he compared Mr. Suder's duties, background, experience, knowledge, and responsibilities, among other characteristics, to those of the CEOs of the other companies. However, his expert report does not contain any details of these comparisons. It was readily apparent from Dr. Hafiz's testimony that he did not know anything about the CEOs of the other companies other than the limited information available in the public domain (i.e., their biographies).

Dr. Hafiz included two components in his computation of "arm's length wages" for a CEO at a company similar to ESI—a base salary and an annual incentive. Dr. Hafiz testified at trial that it is his opinion that Mr. Suder is also entitled to long-term incentives as part of his compensation package. However, Dr. Hafiz did not know whether the ERI database he used includes long-term \*70 incentives. Dr. Hafiz concludes that reasonable wages for Mr. Suder "should not exceed the higher value of the upper-quartile range of" \$1,046,153 for 2004, \$1,018,185 for 2005, \$1,078,203 for 2006, and \$1,131,436 for 2007.

### 3. Mr. Longnecker's Expert Opinion

Mr. Longnecker compared Mr. Suder with CEOs in six different databases: (1) the ERI database of companies with an SIC code of 3660, Hi-Tech & Communications Equipment, in the United States; (2) the ERI database of companies with an SIC code of 3660 in Dallas, Texas; (3) the Kenexa 2012 Market Compensation Survey of companies in the software, networking, and technology industry in the United States; (4) the Kenexa 2012 Market Compensation Survey of companies in the software, networking, and technology industry in Dallas, Texas; (5) the Towers Watson 2012/2013 Top Management Compensation Survey of all organizations with less than \$75 million in revenue; and (6) the Mercer 2012 Executive Compensation Survey of all organizations with less than \$500 million in revenue. Mr. Longnecker states in his expert report that Mr. Suder is a "value creator and should be compensated near the market maximum for the period of 2003-2007". Mr. Longnecker computed reasonable compensation for Mr. Suder for 2004-07 at the 75th percentile, the

- 71 90th percentile, \*71 and the 95th percentile of the market. Mr. Longnecker testified at trial that it is his opinion that Mr. Suder should be compensated at the 90th percentile.

Mr. Longnecker included four components in his compensation analysis—a base salary, an annual incentive, a long-term incentive, and royalties on gross revenue. He computed the following amounts to be reasonable compensation for Mr. Suder for 2004-07 at the 90th percentile:

| Year                | 2004        | 2005       | 2006       | 2007       |
|---------------------|-------------|------------|------------|------------|
| Base salary         | \$402,830   | \$415,273  | \$430,029  | \$444,454  |
| Annual incentive    | 382,689     | 394,509    | 419,278    | 433,342    |
| Long-term incentive | 1,580,571   | 1,629,392  | 1,708,791  | 1,766,111  |
| Royalties           | 8,669,645   | 8,881,913  | 9,621,400  | 10,170,891 |
| Total               | 11,035,7351 | 11,321,086 | 12,179,498 | 12,814,798 |

1 The components do not add up to this total because of rounding.

Mr. Longnecker's expert report contains a very cursory explanation as to how he arrived at the royalty amounts. He states that he "utilized differing royalty rates for each percentile, assuming greater rates at the higher percentiles" and that the "percentages were based on gross revenues, a common characteristic of royalty agreements in the high-tech industry." At trial Mr. Longnecker testified that he used an 18.75% royalty rate for the 75th percentile, a 22.50% royalty rate for the 90th percentile, and a 23.75% royalty rate for the 95th percentile.

- 72 \*72 Mr. Longnecker testified that those royalty rates came from a person named "Dr. Esber" with whom he spoke over the telephone approximately two years before he prepared his expert report. Mr. Longnecker testified that Dr. Esber was "a noted expert in royalties out there in the marketplace", but Mr. Longnecker was unable to recall any information about Dr. Esber's background.

Mr. Longnecker admitted that he was not an expert in valuing intellectual property. It was clear from his testimony that he understood very little about the 13 patents and the reissued patent on which Mr. Suder and Mr. Hansen are named as inventors. Mr. Longnecker did not know who Mr. Hansen was.

In computing the royalty amounts, Mr. Longnecker multiplied the royalty rates Dr. Esber allegedly provided by ESI's gross revenues for 2004-07. Mr. Longnecker did not know what percentages of ESI's gross revenues for 2004-07 were attributable to the 13 patents and the reissued patent or to products that made use of the patented technology. He admitted that it is possible that not all of ESI's gross revenues are so attributable. He testified that he accounted for that possibility by using the royalty rates Dr. Esber provided instead of rates as high as 50% to 70%. We find that testimony to be self-serving and not credible.

## 73 \*73 4. Comparison of Expert Reports

Notwithstanding the section on royalties, we find Mr. Longnecker's expert report to be the more reliable of the two. Mr. Longnecker is an expert in executive compensation. Dr. Hafiz, on the other hand, is an expert in valuation and transfer pricing, which are related but not identical areas. Dr. Hafiz relied on a CBIZ valuation study in his expert report, but he ultimately rejected the very study he relied on at trial. Dr. Hafiz claimed to have compared Mr. Suder's characteristics with those of other CEOs, but his testimony showed that he knew very little about Mr. Suder or the other CEOs.

We agree with Mr. Longnecker that it is reasonable to compensate Mr. Suder at the 90th percentile for 2004-07. Mr. Suder is a visionary who built ESI from the ground up. We also agree with Mr. Longnecker, as did Dr. Hafiz at trial, that a reasonable compensation package for Mr. Suder should include a base salary, an annual incentive, and a long-term incentive. However, we find that it is not appropriate to include a royalty component in Mr. Suder's wage QREs.

- 74 First and foremost, petitioners admit in their reply brief that "Eric Suder was not, and has not, ever been compensated through royalty payments of any kind." It appears that Mr. Longnecker included royalty amounts in his compensation \*74 analysis in an attempt to justify Mr. Suder's wages. We find the royalty amounts in Mr. Longnecker's expert report to be erroneous and unreliable.

Moreover, royalties are not remuneration for services performed by an employee. A royalty is generally defined as a payment that fluctuates with a licensee's usage of a licensor's intellectual property, such as a payment based on the quantity of patented products sold. Tekelec, Inc. v. Verint Sys., Inc., 708 F.3d 658, 666 (5th Cir. 2013); see also Tex. Farm Bureau v. United States, 53 F.3d 120, 123-124 (5th Cir. 1995) (distinguishing royalty payments from payments for personal services). In Sierra Club Inc. v. Commissioner, 86 F.3d 1526, 1532 (9th Cir. 1996), rev'g 103 T.C. 307 (1994), and aff'g T.C. Memo. 1993-199, the U.S. Court of Appeals for the Ninth Circuit held that "a royalty is by definition 'passive' and thus cannot include compensation for services rendered by the owner of the property." Likewise, this Court has stated that "[r]oyalties are defined as payments received for the right to use intangible property rights, and that definition does not include payments for services." Jones v. Commissioner, T.C. Memo. 1998-354, slip op. at 12. Accordingly, even if Mr. Suder were paid royalties, the royalties would not be includible in his wage QREs.

## 75 \*75 E. Conclusion on Section 174(e)

On the basis of the foregoing, we find that Mr. Suder's compensation for 2004-07 was unreasonable under section 174(e). We accept Mr. Longnecker's computations of base salaries, annual incentives, and long-term incentives at the 90th percentile for 2004-07 as reasonable amounts that someone in Mr. Suder's position would ordinarily be paid for performing activities similar to those he performed. See sec. 1.174-2(a)(6), Income Tax Regs.

We find that \$2,366,090 for 2004, \$2,439,174 for 2005, \$2,558,098 for 2006, and \$2,643,907 for 2007 are reasonable amounts to compensate Mr. Suder for the services he performed at ESI. Mr. Wende determined that 75% of Mr. Suder's time was spent performing qualified services and 25% was spent performing nonqualified services. See supra p. 26. We previously found Mr. Wende's allocations to be reasonable. See supra pp. 54-62. Accordingly, we hold that reasonable wage QREs for Mr. Suder are \$1,774,568 for 2004, \$1,829,381 for 2005, \$1,918,574 for 2006, and \$1,982,930 for 2007.

## VI. Accuracy-Related Penalties

Pursuant to section 6662(a) and (b)(1) and (2), a taxpayer may be liable for a penalty of 20% on the portion of an underpayment of tax due to: (1) negligence or disregard of rules or regulations or (2) a substantial understatement of income \*76 tax. "Negligence" is defined as any failure to make a reasonable attempt to comply with the provisions of the Code; this includes a failure to keep adequate books and records or to substantiate items properly. Sec. 6662(c); sec. 1.6662-3(b)(1), Income Tax Regs. Negligence has also been defined as the failure to exercise due care or the failure to do what a reasonable person would do under the circumstances. See Allen v. Commissioner, 92 T.C. 1, 12 (1989), aff'd, 925 F.2d 348, 353 (9th Cir. 1991); Neely v. Commissioner, 85 T.C. 934, 947 (1985). "Disregard" means any careless, reckless, or intentional disregard. Sec. 6662(c). "Understatement" means the excess of the amount of the tax required to be shown on the return over the amount of the tax imposed which is shown on the return, reduced by any rebate. Sec. 6662(d)(2)(A). A "substantial understatement" of income tax is defined as an understatement of tax that exceeds the greater of 10% of the tax required to be shown on the tax return or \$5,000. Sec. 6662(d)(1)(A).

The Commissioner bears the initial burden of production. Sec. 7491(c). If the Commissioner satisfies his burden, the taxpayer then bears the ultimate burden of persuasion. Higbee v. Commissioner, 116 T.C. at 446-447. The accuracy-related penalty is not imposed with respect to any portion of the underpayment as to which the taxpayer shows that he or she acted with reasonable cause and in good faith. Sec. 6664(c)(1); Higbee v. Commissioner, 116 T.C. at 448.

\*77 The decision as to whether the taxpayer acted with reasonable cause and in good faith is made on a case-by-case basis, taking into account the pertinent facts and circumstances, including the taxpayer's knowledge, education, and experience, as well as the taxpayer's reliance on professional advice. Thomas v. Commissioner, T.C. Memo. 2013-60; see Neonatology Assocs., P.A. v. Commissioner, 115 T.C. 43, 99 (2000) (providing a three-prong test to establish reasonable reliance on professional advice), aff'd, 299 F.3d 221 (3d Cir. 2002); sec. 1.6664-4(b)(1), Income Tax Regs. Generally, the most important factor is the extent of the taxpayer's effort to assess his or her proper tax liability. Humphrey, Farrington & McClain, P.C. v. Commissioner, T.C. Memo. 2013-23; sec. 1.6664-4(b)(1), Income Tax Regs.

Regardless of whether respondent has met his burden of production, we find that petitioners are not liable for accuracy-related penalties for 2004-07 because they meet the reasonable cause and good faith exception. The research tax credit is one of the most complicated provisions in the Code. Its complexity is evidenced by the fact that it was the most commonly reported uncertain tax position on Schedule UTP, Uncertain Tax Position Statement, for 2010, 2011, and \*78 2012.<sup>[28]</sup> UTP Filing Statistics (last updated April 29, 2014), <http://www.irs.gov/Businesses/Corporations/UTPFilingStatistics>.

It is clear from the record that Mr. Suder and Mr. Boyd are experienced in telephone systems, not tax matters. They hired Alliantgroup to determine ESI's eligibility for the research tax credit. Alliantgroup performed an R&D study for 1999-02 and provided ESI with a report of their findings at the conclusion of the study. Mr. Wende worked closely with Alliantgroup on the study and was later authorized by Mr. Suder to compute ESI's QREs for the years going forward, including the years at issue.

We find that it was reasonable for Mr. Suder to entrust Mr. Wende with this responsibility and that he did so in good faith. Because Mr. Wende was the senior vice president of product operations from 2004 to 2006 and the senior vice president of product development in 2007, his job was to lead the product development teams at ESI. He knew ESI's employees better than anyone else at the company, and he was intimately familiar with the research and development activities that ESI had undertaken for 2004-07.

79 ESI claimed QREs for 76 projects for 2004-07. Of the 12 projects that we examined in these cases, we concluded that all but Chameleon were qualified \*79 research. In the Chameleon project ESI resolved the technical uncertainty of incorporating a third-party skinning tool into its VIP suite to give users the option to change the look and feel of the user interface. ESI's engineers used the same, or a substantially similar, product development process for Chameleon as they did for the other projects. Although we ultimately determined that Chameleon did not satisfy the process of experimentation test for lack of a qualified purpose, it was reasonable, under the circumstances, for Mr. Wende to believe that Chameleon, like the other projects, satisfied the four-part test for qualified research.

In determining that Mr. Suder's wages were unreasonable in part under section 174(e), we decided an issue of first impression in this Court. Mr. Suder credibly testified that he and Mr. Boyd consulted with his longtime accountant Ms. Rogers in setting their wages for the years at issue. Although Ms. Rogers was not an expert in the research tax credit, she was a veteran C.P.A. with approximately 20 years of experience as a C.P.A. and many more as an accountant. Ms. Rogers credibly testified that she believed Mr. Suder's wages were "low" in comparison to the wages of other CEOs.

80 Mr. Suder and Mr. Boyd based their wages on ESI's growth, overall value, and cashflow. In other words, they based their wages on the success of ESI's business. That might very well have been reasonable from a business standpoint \*80 because Mr. Suder and Mr. Boyd were ESI's sole shareholders. However, as explained supra pp. 62-64, the test of reasonableness is different for purposes of section 174(e). We find that in setting their wages, Mr. Suder and Mr. Boyd had an honest misunderstanding of the tax law that was reasonable in the light of all the facts and circumstances. See sec. 1.6664-4(b), Income Tax Regs. (stating that an honest mistake of law may indicate reasonable cause and good faith).

Accordingly, we find that petitioners acted with reasonable cause and good faith in claiming excessive research tax credits for 2004-07. Therefore, they are not liable for accuracy-related penalties for 2004-07.

In reaching our holdings, we have considered all arguments made, and to the extent not mentioned, we consider them irrelevant, moot, or without merit.

To reflect the foregoing,

Decisions will be entered under Rule 155.

[1] Cases of the following petitioners are consolidated herewith: Eric G. Suder, docket Nos. 14435-09 and 6183-10, and Douglas J. Boyd and Karen B. Boyd, docket Nos. 14460-09 and 6210-10.

[2] It appears from the record that Mr. Suder had also been an employee of ESI since its inception. The parties have stipulated that Mr. Suder was an employee of ESI during the years at issue.

[3] Unless otherwise indicated, all section references are to the Internal Revenue Code (Code) in effect for the years at issue, and all Rule references are to the Tax Court Rules of Practice and Procedure. All monetary amounts are rounded to the nearest dollar.

[4] Respondent determined deficiencies in, and penalties on, petitioners' Federal income tax as follows:

Eric G. Suder, docket Nos. 14435-09 and 6183-10:

| Year | Deficiency | Penalty  |
|------|------------|----------|
| 2004 | \$445,987  | \$89,197 |
| 2005 | 440,306    | 88,061   |
| 2006 | 454,526    | 90,905   |

2007      442,557      88,511

Douglas J. & Karen B. Boyd, docket Nos. 14460-09 and 6210-10:

| Year | Deficiency | Penalty |
|------|------------|---------|
| 2004 | \$46,748   | \$9,350 |
| 2005 | 46,624     | 9,325   |
| 2006 | 48,870     | 9,774   |
| 2007 | 48,378     | 9,675   |

[5] Mr. Hansen described the architecture of a product as the way the different components that make up that product interact with one another to achieve some kind of functionality.

[6] A schematic is a detailed, graphic layout for a circuit that shows the components on the circuit and the connections between them.

[7] The number of prototypes varied from project to project.

[8] As described infra, ESI abandoned the Clark Kent and Pony projects midway through development. We find that ESI used the product development process described supra pp. 8-15 up until the point those two projects were abandoned.

[9] ESI filed amended Forms 1120S for 1999 to 2002 claiming research tax credits. These years are not at issue.

[10] Mr. Wende credibly testified that he gave David Whitmer, a support technician at ESI, a 10% allocation for 2005 and that ESI mistakenly claimed 100% of Mr. Whitmer's wages as qualified services for 2005. We expect the parties to correct Mr. Whitmer's allocation as part of the Rule 155 computations.

[11] Cathy S. Nelson of Viviano & Associates, PC, prepared Mr. Boyd's Forms 1040 for 2004-07.

[12] ESI's accounting department had four accountants during the years at issue. ESI did not have a separate tax department.

[13] Congress introduced the credit for increasing research activities in the Economic Recovery Tax Act of 1981, Pub. L. No. 97-34, sec. 221(a), 95 Stat. at 241. The credit was intended to "stimulate a higher rate of capital formation and to increase productivity", S. Rept. No. 97-144, at 76-77 (1981), 1981-2 C.B. 412, 438-439; H.R. Rept. No. 97-201, at 111 (1981), 1981-2 C.B. 352, 358, and "to encourage business firms to perform the research necessary to increase the innovative qualities and efficiency of the U.S. economy", S. Rept. No. 99-313, at 694 (1986), 1986-3 C.B. (Vol.3) 1, 694; H.R. Rept. No. 99-426, at 177 (1985), 1986-3 C.B. (Vol.2) 1, 177.

Before 1989 the research credit was calculated entirely on the basis of research expenditures. In the Omnibus Budget Reconciliation Act of 1989, Pub. L. No. 101-239, sec. 7110(b), 103 Stat. at 2323-2324, Congress substantially altered the scheme for calculating the research credit, effectively tying the credit computation to not only research expenditures, but also "gross receipts". In making these changes, Congress sought to "enhance the credit's incentive effect" while at the same time preserving "an incremental credit structure in order to maximize the credit's efficiency by not allowing (to the extent possible) credits for research that would have been undertaken in any event." H.R. Rept. No. 101-247, at 1199 (1989), 1989 U.S.C.A.N. 1906, 2669.

[14] A higher fixed-base percentage results in a lower credit amount.

[15] In the Tax Relief and Health Care Act of 2006, Pub. L. No. 109-432, di v. A, sec. 104(c)(1), 120 Stat. at 2935, Congress redesignated para. (5) of sec. 41(c) as para. (6).

[16] In-house research expenses also include amounts paid or incurred in relation to a person for the right to use computers in the conduct of qualified research. Sec. 41(b)(2)(A)(iii).

[17] We have previously called this test the "discovery test". See Norwest Corp. & Subs. v Commissioner, 110 T.C. 454, 491 (1998). Before the promulgation of sec. 1.41-4(a)(3)(ii), Income Tax Regs., we held that this test had a "discovery" component that was to be construed more narrowly than the discovery test of sec. 174 and required that the taxpayer discover information that went beyond the current state of knowledge in the relevant field. See *id.* at 493. However, as we have explained: "A determination that research is undertaken for the purpose of discovering information that is technological in nature does not require the taxpayer be seeking to obtain information that exceeds, expands or refines the common knowledge of skilled professionals in the particular field of science or engineering in which the taxpayer is performing the research." Union Carbide Corp. & Subs. v. Commissioner, T.C. Memo. 2009-50, slip op. at 191 n.42 (quoting sec. 1.41-4(a)(3)(ii), Income Tax Regs.), *aff'd*, 697 F.3d 104 (2d Cir. 2012). These regulations apply for taxable years ending on or after Dec. 31, 2003, sec. 1.41-4(e), Income Tax Regs., and are thus operative in these cases.

[18] Deductions are allowed under sec. 174 only to the extent that they are reasonable. Sec. 174(e). Respondent disputes the reasonableness of Mr. Suder's wages as QREs under sec. 174(e). We discuss this issue separately infra pp. 62-75.

[19] Clark Kent and Pony were abandoned midway through development. However, successful completion of a project is not a requisite of qualified research. See, e.g., sec. 1.41-4(a)(3)(ii), Income Tax Regs. ("[A] determination that research is undertaken for the purpose

of discovering information that is technological in nature does not require that the taxpayer succeed in developing a new or improved business component."); sec. 1.174-2(a)(1), Income Tax Regs. (effective July 21, 2014 (T.D. 9680, 2014-32 I.R.B. 254, 257)) ("The ultimate success, failure, sale, or use of the product is not relevant to a determination of eligibility under section 174.").

[20] Mr. Weber was in charge of software development at ESI from 2004-07.

[21] Mr. Fathman worked as a software engineer at ESI from 2004-07 except for the period from May 2006 to July 2007.

[22] Ms. Nichols was a document control administrator for 2004 and a reseller quality program administrator for 2005-07.

[23] In 2014 this section was redesignated sec. 1.174-2(a)(9), Income Tax Regs.

[24] An additional factor considered in Mayson Mfg. Co. v. Commissioner, 178 F.2d 115, 119 (6th Cir. 1949), was "the amount of compensation paid to the particular employee in previous years." In Rutter v. Commissioner, 853 F.2d 1267, 1271 (5th Cir. 1988), aff'g T.C. Memo. 1986-407, the U.S. Court of Appeals for the Fifth Circuit listed that factor as another factor to be considered in determining the reasonableness of compensation. We have taken it into consideration in determining the reasonableness of Mr. Suder's wages.

[25] We calculate the ratios of Mr. Suder's wages to Mr. Boyd's wages to be approximately 9.28:1 for 2004, 8.09:1 for 2005, 8.06:1 for 2006, and 8.05:1 for 2007.

[26] Mr. Hansen's wages decreased slightly from 2004 to 2005, while Mr. Suder's and Mr. Boyd's wages increased from 2004 to 2005. Mr. Hansen's wages increased from 2005 to 2006 and 2006 to 2007, while Mr. Suder's and Mr. Boyd's wages decreased from 2005 to 2006 and 2006 to 2007.

[27] As a general rule, payments made to shareholders of a corporation in proportion to their ownership interests are improper if they are in excess of what is usually paid for similar services. See Owensby & Kritikos, Inc. v. Commissioner, 819 F.2d 1315, 1325 (5th Cir. 1987), aff'g T.C. Memo. 1985-267; sec. 1.162-7(b)(1), Income Tax Regs. As explained infra pp. 67-74, we find that Mr. Suder's wages exceeded the wages paid to CEOs of companies comparable to ESI.

[28] Schedule UTP was a new schedule for the 2010 filing season.

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