

No. 11-2552

IN THE UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

UNION CARBIDE CORPORATION AND SUBSIDIARIES,

Petitioner-Appellant,

v.

COMMISSIONER OF INTERNAL REVENUE,

Respondent-Appellee.

ON APPEAL FROM THE DECISION
OF THE UNITED STATES TAX COURT

BRIEF FOR THE APPELLEE

TAMARA W. ASHFORD
Deputy Assistant Attorney General

GILBERT S. ROTHENBERG (202) 514-3361
JONATHAN S. COHEN (202) 514-2970
ANDREW M. WEINER (202) 305-2701

Attorneys
Tax Division
Department of Justice
Post Office Box 502
Washington, D.C. 20044

TABLE OF CONTENTS

| | Page |
|--|------|
| Table of contents. | i |
| Table of authorities. | iii |
| Glossary. | vii |
| Statement of jurisdiction. | 1 |
| Statement of the issues. | 3 |
| Statement of the case. | 4 |
| Statement of the facts. | 6 |
| A. UCC and its manufacturing business. | 6 |
| B. The Amoco anti-coking project. | 7 |
| C. The sodium borohydride project. | 11 |
| D. The UCAT-J project. | 14 |
| E. The Tax Court proceedings. | 17 |
| Summary of argument. | 21 |
| Argument: | |
| The Tax Court correctly concluded that UCC's costs of supplies for production were not eligible for the research credit, and that the sodium borohydride project did not constitute qualified research. | 25 |
| Standard or review. | 25 |
| A. Introduction: The research credit under I.R.C. §41. | 26 |
| B. The Tax Court correctly disallowed the claimed supply costs. | 34 |

| | Page |
|---|-------------|
| 1. The cost of supplies used to produce goods for sale were “indirect research expenses,” excluded from the definition of “qualified research expenses” under Treas. Reg. § 1.41-2(b)(1)..... | 34 |
| 2. UCC’s argument that the claimed supply costs satisfy the relevant definition of “qualified research expenses” under I.R.C. § 41(b)(2)(A)(ii) is flawed. | 46 |
| 3. The claimed supply costs were unreasonable. | 64 |
| 4. The claimed supply costs were, in part, non-extraordinary utility costs excluded from the definition of “qualified research expenses” under Treas. Reg. § 1.41-2(b)(2). | 66 |
| C. The Tax Court’s finding that the sodium borohydride project failed to satisfy the “process of experimentation” test of qualified research is supported by the record..... | 66 |
| Conclusion..... | 70 |
| Statutory Addendum..... | 71 |
| Certificate of compliance..... | 80 |
| Certificate of service..... | 81 |

- iii -

TABLE OF AUTHORITIES

| Cases: | Page(s) |
|---|----------------|
| <i>Auburn Housing Authority v. Martinez</i> , 277 F.3d 138 (2d Cir. 2002). | 46, 47 |
| <i>Bailey v. United States</i> , 516 U.S. 137 (1995). | 47 |
| <i>Bausch & Lomb, Inc. v. Commissioner</i> , 933 F.2d 1084 (2d Cir. 1991). | 26 |
| <i>In re Boodrow</i> , 126 F.3d 43 (2d Cir. 1997). | 47 |
| <i>Brown v. Gardner</i> , 513 U.S. 115 (1994). | 47 |
| <i>Eustace v. Commissioner</i> , 312 F.3d 905 (7th Cir. 2002).. | 67, 69 |
| <i>Field v. United States</i> , 381 F.3d 109 (2d Cir. 2004). | 25 |
| <i>Frank G. v. Board of Education of Hyde Park</i> , 459 F.3d 356 (2d Cir. 2006). | 50 |
| <i>Fudim v. Commissioner</i> , 67 T.C.M. (CCH) 3011 (1994).. | 56 |
| <i>Helvering v. Northwest Steel Rolling Mills, Inc.</i> , 311 U.S. 46 (1940). | 26, 48 |
| <i>Lockheed Martin Corp. v. United States</i> , 49 Fed. Cl. 241 (2001).. . . . | 56 |
| <i>Long Island Care at Home, Ltd. v. Coke</i> , 551 U.S. 158 (2007).. | 35 |
| <i>Mayo Foundation for Medical Education & Research</i> <i>v. United States</i> , 131 S. Ct. 704 (2011). | 34, 35 |
| <i>Mayrath v. Commissioner</i> , 41 T.C. 582 (1964). | 58 |
| <i>Merrill Lynch & Co. v. Commissioner</i> , 386 F.3d 464 (2d Cir. 2004). | 25 |
| <i>Millea v. Metropolitan-North R.R.</i> , 658 F.3d 154 (2d Cir. 2011).. . . . | 58 |
| <i>New Colonial Ice Co. v. Helvering</i> , 292 U.S. 435 (1934).. | 26 |
| <i>Nken v. Holder</i> , 129 S. Ct. 1749 (2009).. | 46 |
| <i>Norwest Corp. v. Commissioner</i> , 110 T.C. 454 (1998). | 58, 64, 67, 69 |
| <i>RAPCO, Inc. v. Commissioner</i> , 85 F.3d 950 (2d Cir. 1996).. | 25, 26 |
| <i>Robinson v. Shell Oil Co.</i> , 519 U.S. 337 (1997). | 46 |
| <i>Schumacher v. United States</i> , 931 F.2d 650 (10th Cir. 1991). | 26 |
| <i>TG Missouri Corp. v. Commissioner</i> , 133 T.C. 278 (2009).. | 56, 57 |
| <i>Trinity Industrial v. United States</i> , 691 F. Supp. 2d 688 (N.D. Tex. 2010). | 56 |

| Cases (continued): | Page(s) |
|--|----------------|
| <i>United Saving Association of Texas v. Timbers of Inwood Forrest Associates, Ltd.</i> , 484 U.S. 365 (1988). | 47, 50 |
| <i>United States v. Cleveland Indians Baseball Co.</i> , 532 U.S. 200 (2001). | 50 |
| <i>United States v. McFerrin</i> , 570 F.3d 672675 (5th Cir. 2009). | 26 |
| <i>United Stationers, Inc. v. United States</i> , 163 F.3d 440 (7th Cir. 1998). | 25, 26, 62 |

Statutes:

Internal Revenue Code (26 U.S.C.):

| | |
|----------------------------|--------------------|
| § 41. | <i>passim</i> |
| § 41(a). | 27 |
| § 41(b). | 27, 64 |
| § 41(b)(2)(A). | 28 |
| § 41(b)(2)(A)(i). | 5, 39, 49 |
| § 41(b)(2)(A)(ii). | <i>passim</i> |
| § 41(b)(2)(B). | 28, 49 |
| § 41(b)(2)(B)(i). | 39 |
| § 41(b)(2)(C). | 28 |
| § 41(c). | 27 |
| § 41(d)(1). | 39, 54 |
| § 41(d)(1)(A). | 24, 32, 58, 64 |
| § 41(d)(1)(B)(i). | 32 |
| § 41(d)(1)(B)(ii). | 32 |
| § 41(d)(1)(C). | 20, 24, 32, 66 |
| § 41(d)(2). | 39, 54 |
| § 41(d)(2)(A). | 33, 49 |
| § 41(d)(2)(B). | 33 |
| § 41(d)(2)(C). | <i>passim</i> |
| § 41(d)(4)(A). | 33, 58, 61 |
| § 162. | 30 |
| § 174. | 29, 30, 32, 58, 64 |
| § 174(e). | 24, 64 |
| § 6213(a). | 2 |
| § 6214. | 2 |
| § 7442. | 2 |

| Statutes (continued): | Page(s) |
|--|----------------|
| Internal Revenue Code (26 U.S.C.): | |
| § 7482(a). | 2 |
| § 7482(b). | 2 |
| § 7483. | 2 |
| § 7502. | 2 |
| § 7805(a). | 35 |
| Economic Recovery Tax Act of 1981, Pub. L. 97-34, § 221, 95 Stat. 172. | |
| | 29 |
| Small Business Job Protection Act of 1996, Pub. L. 104-88, § 1204(a), 110 Stat. 1755. | |
| | 32 |
| Tax Reform Act of 1986, Pub. L. 99-514, 100 Stat. 2085: | |
| § 231(a). | 31 |
| § 231(b). | 31 |
| § 231(d). | 31 |
| Rules and Regulations: | |
| Fed. R. App. P. 13(a)(2). | |
| | 2 |
| T.C. Rule 142 | |
| | 26 |
| Treasury Regulations (26 C.F.R.): | |
| § 1.174-2(a)(6). | 64 |
| § 1.41-2. | 46 |
| § 1.41-2(b)(1). | <i>passim</i> |
| § 1.41-2(b)(2). | <i>passim</i> |
| § 1.41-2(c)(3). | 29 |
| § 1.41-4(a)(5). | 66, 67 |
| § 1.41-4(b). | 60 |
| § 1.41-4(b)(2). | 33, 49 |

| Miscellaneous: | Page(s) |
|--|----------------|
| 127 Cong. Rec. S17458..... | 53 |
| 135 Cong. Rec. S24331 (Oct. 12, 1989). | 37 |
| H. Conf. Rep. 97-215 (1981), 1981 U.S.C.C.A.N. 285. | 27 |
| H. Conf. Rep. 99-841 (1986), 1986 U.S.C.C.A.N. 4075. | 33, 66 |
| H.R. Hrg. 98-102 (1984)..... | 30, 31, 40, 54 |
| H.R. Rep. 97-201 (1981), 1981-2 C.B. 352. | <i>passim</i> |
| H.R. Rep. No. 99-426 (1985), 1986-3 (vol. 2) C.B. 1. | 30, 39, 53 |
| S. Hrg. 98-843 (1984). | 30, 31, 40, 54 |
| S. Rep. No. 99-313 (1986), 1986-3 (vol. 3) C.B. 1. | 30, 39, 53 |
| 2A Norman J. Singer & J.D. Shambie Singer, <i>Statutes & Statutory Construction</i> (7th ed. 2007). | 47 |
| Staff of the Joint Committee on Taxation, 97th Cong., 1st Sess., General Explanation of the Economic Recovery Tax Act of 1981 (J. Comm. Print 1981). | 29, 37 |
| <i>Webster's New International Dictionary</i> (3d ed. 1966). | 47, 48 |

- vii -

GLOSSARY

| | |
|----------------|--|
| A__ | Joint Appendix |
| Am. Br. | Brief of Amici Curiae National Association of Manufacturers, American Chemistry Counsel, and Chamber of Commerce of the United States of America |
| Br. | Brief for the Appellant |
| Commissioner | Commissioner of Internal Revenue |
| I.R.C. or Code | Internal Revenue Code of 1986 (26 U.S.C.) |
| IRS | Internal Revenue Service |
| MEA | monoethanolamine |
| Morton | Morton Performance Chemicals |
| Op. | The Tax Court's opinion, entered on March 10, 2009, and reported at 97 T.C.M. (CCH) 1207 (2009). |
| RSA__ | Respondent-Appellee's Supplemental Appendix |
| Shell | Shell Oil Company |
| SPA__ | Special Appendix |
| TLE | transfer line exchanger |
| Treas. Reg. | Treasury Regulation (26 C.F.R.) |
| Treasury | Department of the Treasury |
| UCC | Union Carbide Corporation and Subsidiaries |

**IN THE UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT**

No. 11-2552

UNION CARBIDE CORPORATION AND SUBSIDIARIES,

Petitioner-Appellant,

v.

COMMISSIONER OF INTERNAL REVENUE,

Respondent-Appellee.

**ON APPEAL FROM THE DECISION OF THE
UNITED STATES TAX COURT**

BRIEF FOR THE APPELLEE

STATEMENT OF JURISDICTION

On March 22, 1999, the Internal Revenue Service (“IRS”) issued a notice of deficiency to Union Carbide Corporation and Subsidiaries (“UCC”) regarding its 1994 and 1995 tax years. (A67.)¹ On June 17,

¹ “A__” references are to documents contained in the Joint Appendix. “SPA__” references are to document’s contained in the Special Appendix. “RSA__” references are to document’s contained in the respondent-appellee’s Supplemental Appendix. “Op.” references are to
(continued...)

- 2 -

1999, UCC timely filed a petition for redetermination in the Tax Court. (A22.); *see* Internal Revenue Code of 1986 (26 U.S.C.) (“I.R.C.” or the “Code”) §§ 6213(a), 7502. The Tax Court had jurisdiction under I.R.C. §§ 6213(a), 6214, and 7442.

On April 1, 2011, the Tax Court entered a decision resolving all issues of all parties. (SPA73.) On June 23, 2011, UCC timely filed a notice of appeal. (A130); *see* I.R.C. §§ 7483, 7502; Fed. R. App. P. 13(a)(2). This Court has jurisdiction under I.R.C. § 7482(a), and venue is proper under I.R.C. § 7482(b).

(...continued)

the Tax Court’s opinion, reported at 97 T.C.M (CCH) 1207 (2009). “Br.” references are to the Brief for the Appellant. “Am. Br.” references are to the Brief of Amici Curiae National Association of Manufacturers, American Chemistry Counsel, and Chamber of Commerce of the United States of America.

- 3 -

STATEMENT OF THE ISSUES

1. Section 41 of the Code provides a credit for increased spending on “qualified research” activities. The Tax Court concluded that UCC conducted qualified research on aspects of its commercial production processes at its manufacturing plants, during which time it produced goods for sale in the ordinary course of its manufacturing business. Therefore, unlike laboratory research, the activities at issue here served two ends – research on the production process and production of goods for sale. We are not aware of any case that addresses the application of the research credit in this context. The first issue on appeal is whether the cost of raw materials, fuel, and utilities used to produce goods for sale, costs which UCC would have incurred whether or not it conducted any qualified research activities, are nevertheless eligible for the research credit as the cost of supplies “used in the conduct of qualified research” for purposes of I.R.C. § 41(b)(2)(A)(ii).

2. One of the requirements of qualified research is that the research must follow a process of experimentation capable of evaluating more than one alternative. The second issue on appeal is whether the Tax Court clearly erred in concluding that UCC’s sodium borohydride

- 4 -

project did not constitute qualified research because UCC did not follow a process of experimentation, but rather merely confirmed that its use of sodium borohydride would achieve the intended result.

STATEMENT OF THE CASE

This case concerns whether UCC is entitled to additional research credits under I.R.C. § 41 based on research activities conducted at its manufacturing plants in 1994 and 1995. On its income tax returns for those years, UCC claimed research credits based on the cost of research conducted at the laboratory and pilot-plant levels, and on wages paid to UCC's R&D scientists and engineers for research conducted at the manufacturing-plant level. (Op. 1274-75.) In its petition to the Tax Court, UCC claimed additional research credits based on its normal production costs – *i.e.*, the cost of supplies used to produce goods for sale and the wages paid to the plant operators – on the theory that normal operations were necessary to conduct research at the manufacturing-plant level. (Op. 1273; A127 ¶ 2.) UCC identified 106 projects conducted at its manufacturing plants, which it claimed met the requirements of the research credit. (Op. 1212; A136 ¶ 14.) The parties agreed to try five of the largest projects as a representative

- 5 -

sample, among other issues implicated by the claimed additional research credits. (Op. 1212; A136 ¶ 16.)

Following a lengthy trial, the Tax Court issued an opinion, reported at 97 T.C.M. (CCH) 1207 (2009), disallowing nearly all of UCC's claimed "qualified research expenses" used to calculate the credit. The Tax Court held that three of the five research projects did not constitute "qualified research" for purposes of the research credit. (Op. 1261-62.) With respect to the remaining two projects that did constitute qualified research, the Tax Court held that the claimed supply costs to produce goods for sale were "at best, indirect research costs," and, thus, ineligible for the research credit under Treasury Regulation (26 C.F.R.) ("Treas. Reg.") § 1.41-2(b)(1) and I.R.C. § 41(b)(2)(A)(ii), and that most of the claimed wages expenses also were not eligible for the research credit because UCC did not establish that the wages were paid to plant operators for engaging in or supervising qualified research as required under I.R.C. § 41(b)(2)(A)(i). (Op. 1273, 1275.)

The parties subsequently stipulated that, under the Tax Court's opinion, UCC would not receive an additional research credit for 1994

- 6 -

or 1995 pursuant to the affirmative claims in its petition. (A225 ¶ 2.)

The Tax Court then entered a decision as to UCC's petition, which UCC now appeals. (SPA73-75.)

STATEMENT OF THE FACTS

A. UCC and its manufacturing business

UCC was a manufacturer and marketer of basic chemical and plastics and specialty and intermediate chemicals. (Op. 1212; A133 ¶ 3.) At issue here was its production of olefins and polyethylene. Olefins are used as fuel and as raw materials for the production of chemicals and plastics. (Op. 1214; A133 ¶ 4.) Polyethylene is the world's most widely used plastic; it is used to make food containers, plastic bottles, and grocery and trash bags, among many other things. (Op. 1212-13; A133-34 ¶ 5.) Of the research projects tried before the Tax Court, the Amoco anti-coking project, the spuds project, the sodium borohydride project, and the UOP GA-155 project, related to olefins production, were carried out at the Taft Plant. (Op. 1214; A143 ¶ 45.) The UCAT-J project, related to polyethylene production, was carried out at the Star Plant. Both plants were located in Hahnville, Louisiana. (Op. 1214; A136-37 ¶ 17.)

- 7 -

The Tax Court found that the spuds project and the UOP GA-155 project did not constitute “qualified research” for purposes of the research credit, and UCC does not appeal either finding. Therefore, we focus on the other three projects.

B. The Amoco anti-coking project

The Amoco anti-coking project was aimed at reducing the formation of coke that accumulates in cracking coils and downstream components in olefins production plants. UCC’s olefins production involved the thermal “cracking” of raw hydrocarbon feedstock such as ethane, propane, and naphtha by exposing it to extreme temperatures in the range of 1400 to 1650 degrees Fahrenheit. (Op. 1214; A143-44 ¶¶ 46, 49; A1083.) In simplest terms, this occurs by diluting the feedstock with steam and running it through a furnace fitted with cracking coils. (Op. 1214; A144 ¶ 50.) The cracked gas or “effluent” is then cooled rapidly in a heat exchanger, referred to as a transfer line exchanger or “TLE,” to minimize secondary chemical reactions. (Op. 1214; A145 ¶ 52.) The effluent then passes from the hot section of the plant to the cold (recovery) section, where it is chilled to approximately

- 8 -

minus 200 degrees Fahrenheit and separated out into various products. (Op. 1215; A144 ¶¶ 53, 54; A1085.)

Coke is a byproduct of the cracking process. It is a heavy, hard and relatively brittle form of carbon, which adversely affects furnace performance, and clogs cracking coils and downstream equipment. (Op. 1215; A147 ¶¶ 59, 61.) Coke insulates cracking coils from the inside, impeding the efficient transfer of heat from the furnace to the diluted feedstock. (Op. 1215; A147 ¶ 60.) Clogging reduces the desired ethylene yield from cracking. (Op. 1215; A147 ¶¶ 60, 61.) As a result, normal furnace operation at Taft included a decoking regimen of “hot decokes” every 30 to 60 days, which involved feeding air and steam into the cracking coils at elevated temperatures, and, after three or four “hot decokes,” a “cold turnaround” to replace cracking coils and manually remove coke from the TLE system. (Op. 1215; A148 ¶ 63.)

UCC, and the industry at large, had been searching for an effective way to mitigate coke, thereby reducing maintenance and increasing production. (Op. 1215; A1067.) In 1994 and 1995, UCC considered at least four anti-coking technologies before proceeding to test the technology developed by Amoco Chemical Corporation

- 9 -

(“Amoco”) because it seemed the “furthest advanced.” (Op. 1216; RSA4.) The Amoco technology involved the pretreatment of cracking coils with a proprietary compound that purportedly would prevent coke from forming, and so extend furnace-run times between decokes. (Op. 1216; A1069.) UCC designed a plant-level test to determine its interest in a licensing arrangement. (Op. 1216; A295.) Amoco offered to help with the cost of the test by providing the treatment free of charge and agreeing to pay for any overtime that UCC’s plant operators would be required to work. (Op. 1216; A1237-38 Tr. 209-12.) UCC estimated that its own cost from the Amoco anti-coking project would be \$222,000, and did not include in its estimate the cost of any supplies used in normal plant operations. (A287, A290-91; A1299 Tr. 460.)

At the same time, UCC intended to – and, in fact, did – operate its plant normally, without any decrease in production of olefins products. (Op. 1216-17.) As a general matter, UCC considered it very important that a plant test not compromise either its manufacturing processes or products. As summed up by a UCC research scientist and consultant, Dr. Robert Manyik, “production is everything.” (A1415 Tr. 911.) And this was true with respect to the Amoco anti-coking project. (A1289 Tr.

- 10 -

421; A1294 Tr. 440.) UCC operated Taft at full capacity during the Amoco anti-coking project, used the same amount of utilities and feedstock as it normally did, and sold the products produced in the ordinary course of its business. (Op. 1217; A1073; A1268 Tr. 338; A1297 Tr. 454; A1299 Tr. 463.)

In November 1994, UCC applied the first pretreatment to four of six cracking coils in furnace 24, and then operated the plant normally, including performing a hot decoke after approximately 45 days. (Op. 1216-17; A1770 Tr. 2361.) UCC collected between seven and eight weeks of data and prepared a report analyzing the initial results. (Op. 1217; A305-28.) The data indicated no reduction in coke formation following the hot decoke. (Op. 1217; A305.) UCC suspected that the hot decoke prior to the pretreatment might have been inadequate. (Op. 1217; A313.) Therefore, it applied a second pretreatment in April 1995, which effectively duplicated its initial test results. (Op. 1217; A1771 Tr. 2367.) Finally, in August 1995, during the cold turnaround, UCC discovered excess coke deposits in the part of the TLE system downstream from the pretreated coils. (Op. 1217; A1260 Tr. 305-07.)

- 11 -

UCC believed that the Amoco anti-coking technology might have been a cause, and terminated the project. (Op. 1217; A1264 Tr. 322.)

C. The sodium borohydride project

The sodium borohydride project concerned the removal of acetaldehyde from cracked gas using sodium borohydride. Normally, acetaldehyde was removed by the monoethanolamine (“MEA”) system, which was one of two components of the acid gas removal system. (Op. 1219; A172 ¶ 227.) Cracked gas contains acid gases that were harmful to downstream equipment, and had to be filtered out to meet product specifications. (Op. 1219; A171 ¶ 226.) Both the MEA system and the caustic scrubber were designed to remove acid gases. (Op. 1219; A172 ¶ 229.) An incidental benefit of the MEA system was that it also removed acetaldehyde formed during cracking. Acetaldehyde was harmful to downstream equipment, and was an impurity in crude butadiene sold by UCC. (Op. 1219; A1394-95 Tr. 828-30.) UCC’s primary customer for crude butadiene produced at Taft, Shell Oil Company (“Shell”), specified that the butadiene had to contain no more than 100 parts per million of acetaldehyde. (Op. 1219; A1396 Tr. 833.) The problem was that after operating for three to six months, the MEA

- 12 -

system had to be shut down and cleaned, which took approximately two weeks. (Op. 1219; A1395 Tr. 831.) In the interim, the caustic scrubber sufficiently removed acid gases, but had no effect on acetaldehyde. (Op. 1219; A172 ¶ 230.) Crude butadiene produced when the MEA system was offline contained acetaldehyde concentrations between 500 and 800 parts per million. (Op. 1219; A397.)

UCC sought to solve this problem by injecting sodium borohydride into the caustic scrubber to removed acetaldehyde when the MEA system was offline. (Op. 1219; A397.) UCC had long known that sodium borohydride was effective at removing acetaldehyde, and also knew that some of its competitors used it commercially for that purpose. (Op. 1220; A399-400.) What it did not know was what how well liquid sodium borohydride would interact with cracked gas in the caustic scrubber. (Op. 1220; A402.) Dr. Manyik prepared a pretest report summarizing the potential for using sodium borohydride to remove acetaldehyde in the caustic scrubber (A397-402.) Beginning on June 12, 1995, UCC injected sodium borohydride for two weeks while the MEA system was offline. (Op. 1221; A1438 Tr. 1003.)

- 13 -

UCC acquired a sodium borohydride solution marketed as VenPure by Morton Performance Chemicals (“Morton”). (Op. 1219; A172 ¶ 231.) Morton recommended the amount of the solution to use, and UCC “basically went with Martin’s [sic] instructions.” (Op. 1221; A1485 Tr. 1185-87.) UCC made adjustments when there was a change in the volume of cracked gas in the caustic scrubber, and confirmed that the amount of sodium borohydride was sufficient to keep the crude butadiene within specifications. (Op. 1221; A1485 Tr. 1186-87.) UCC did not, however, record its injection rates. (Op. 1221; A1483 Tr. 1179.) UCC tested the crude butadiene for acetaldehyde more often than it typically did. (Op. 1221; A1483 Tr. 1176.) Again, it did not document the results. (Op. 1221.) In general, other than a daily operating log kept as a matter of course, UCC had no record of its use of sodium borohydride. (A1409 Tr. 886-87; A1483 Tr. 1177-79.) Because acetaldehyde concentrations in the crude butadiene did not exceed 100 parts per million, UCC began using sodium borohydride regularly when the MEA system was offline. (Op. 1221; A1442 Tr. 1014-15.)

Years later, UCC discovered that the sodium borohydride caused high levels of ethanol in the crude butadiene. (Op. 1221; A542.) UCC

- 14 -

knew that ethanol was a byproduct of the reaction between sodium borohydride and acetaldehyde, but believed it would remain in the caustic solution and did not test for it. (Op. 1221; A397.) UCC began using a different product to remove acetaldehyde when its crude butadiene failed Shell's new ethanol specification. (Op. 1221.)

D. The UCAT-J project

The UCAT-J project involved the use of a new polyethylene catalyst, UCAT-J, to produce polyethylene resin at the Star Plant. Star reactors used UNIPOL process technology, which UCC had developed and licensed to third parties. (Op. 1224; A1519 Tr. 1317-18.) UNIPOL reactors experienced occasional, significant operability issues, including the formation of "sheets" and "agglomerates." (Op. 1224-25; A1565 Tr. 1499-1501.) Sheets occur when polyethylene resin fuses together along reactor walls, forming masses that potentially are several inches thick and several feet wide. (Op. 1225; A1565 Tr. 1499-1500.) Agglomerates occur when the resin fuses together to form solid chunks, potentially several feet in diameter. (Op. 1225; A1565 Tr. 1501.) Both sheets and agglomerates are "continuity problems," because they require reactor shutdowns. (Op. 1225; A1565 Tr. 1499.) Product consistency was

- 15 -

another UNIPOL reactor issue. The production of off-grade polyethylene resin was not unusual, and UCC sold both aim-grade and off-grade material. (Op. 1225; A1637 Tr. 1782.) UCC experienced both issues with its long-standing M-1 catalyst. (A951; A1639 Tr. 1790; A1728-29 Tr. 2141-43.)

UCAT-J offered several advantages over M-1. Primarily, it was four times more “active” than M-1, meaning that the same amount of UCAT-J could produce four times the amount of resin, and it required less amounts of other ingredients in the production process. (Op. 1225; A685.) In both respects, UCAT-J promised to reduce production costs. (A1571 Tr. 1523-24.) And it had the potential to improve certain resin properties. (Op. 1225; A687.) UCC stood to benefit both in its manufacturing business and in its licensing business by marketing UCAT-J to existing and potential licensees of its UNIPOL technology. (Op. 1227; A1532 Tr. 1368.)

Before 1994, UCC had conducted nine production runs using UCAT-J at Star, and still others at its smaller Seadrift manufacturing plant and at its South Charleston pilot plant. (Op. 1227-28.) UCC, however, considered a technology “experimental” until it had conducted

- 16 -

at least two, and preferably three, successful runs of a particular resin at a particular plant. (Op. 1226; A1533 Tr. 1372; A1634 Tr. 1770.)

Therefore, it considered all of the 19 UCAT-J runs at Star in 1994 and in the first half of 1995 to be “experimental,” and carried out the runs with an R&D representative on site. (Op. 1227.)

At the same time, UCC conducted each of the UCAT-J runs during the relevant time period to fulfill existing customer orders. (Op. 1227.) UCC stated that “[w]e want to manage the runs at Star to ensure that all materials will be used to fill existing orders (including qualification HC’s).”² (RSA90; A1634 Tr. 1770-71.) Thus, for example, UCC conducted run number two to “fill regular sales contract orders” from customers who previously received an equivalent resin made with M-1 to manufacturer dry cleaning and produce bags. (RSA 86-89; A1551 Tr. 1445-46.) UCC produced 4,832,092 pounds of aim-grade resin, sufficient to make over 125 million dry cleaning bags. (Op. 1230; A893 n.91.) All aim-grade resin, and apparently all off-grade resin,

² “HC’s” are railroad hopper cars. (Op. 1224; A878 n.28.) Products for “qualification” are those sent to customers to determine the suitability of the product for the customer’s purpose. (Op. 1226; A881)

- 17 -

produced in the UCAT-J runs were sold to customers. (Op. 1227; A749; A888.)

E. The Tax Court proceedings

In response to the notice of deficiency regarding its 1994 and 1995 tax years, UCC filed a petition in the Tax Court alleging, among other things, that it was entitled to additional research credits under I.R.C. § 41, above what it originally claimed on its tax returns. Specifically, UCC alleged that it was entitled to additional research credit of \$3,656,091 for 1994, and \$4,726,664 for 1995, based on 106 projects conducted at its manufacturing plants. The parties agreed to try only five of the largest projects.

The research tax credit is designed to encourage taxpayers to increase spending on “qualified research,” as defined under I.R.C. § 41(d). The credit calculation is based on the cost of performing such research, or “qualified research expenses,” as defined under I.R.C. § 41(b). UCC claimed, as qualified research expenses, the total cost of supplies to produce goods for sale while it conducted the purported plant-based research. With respect to the Amoco anti-coking project, UCC claimed the cost of the feedstock and the utility costs, including

- 18 -

the fuel costs to power the furnace and refrigeration, incurred in olefins production at Taft from the first pretreatment in November 1994 through June 1995.³ (Op. 1235-36; A792-96.) With respect to the UCAT-J project, UCC claimed the amounts reflected in cost accounting records for the particular run (or similar run if records were unavailable). (Op. 1237; A788-91.) On its 1994 and 1995 tax returns, UCC reported these supply costs as the cost of goods sold. (Op. 1214; A208 ¶ 1083.) In other words, the supply costs would have been incurred in the normal course of UCC's manufacturing business, regardless of whether any of the projects took place.

UCC also claimed as qualified research expenses wages paid to certain Taft operators responsible for carrying out the Amoco anti-coking project, and to all Star operators attributable to operations during the UCAT-J runs. (Op. 1236-37; A791, A798.) UCC already had received a credit based on wages paid to its R&D scientists and engineers involved in the projects. (Op. 1275.)

³ UCC did not consider the Amoco anti-coking project to have ended until August 1995, when it discovered excess coke in the TLE system. (A1264 Tr. 322.) But, as explained below, the research credit temporarily expired on June 30, 1995, and was not available for the remainder of that year.

- 19 -

The Tax Court disallowed nearly all of UCC's claimed qualified research expenses. It found that the Amoco anti-coking project and the UCAT-J project constituted qualified research, but that they did not allow UCC to treat its supply costs to produce goods for sale as qualified research expenses. The Tax Court explained that, to the contrary, "[t]hese costs are, at best, indirect research costs, excluded from the definition of QREs under section 1.41-2(b)(2), Income Tax Regs."⁴ (Op. 1273.)

UCC argued, as it does on appeal, that because its research at the manufacturing-plant level could not have occurred without incurring costs of supplies for production, such costs were qualified research expenses because they were "paid or incurred for supplies used in the conduct of qualified research" within the meaning of I.R.C.

§ 41(b)(2)(A)(ii). (*Id.*) The Tax Court disagreed, concluding that "amounts incurred during the production process upon which the qualified research was conducted, not during the conduct of the qualified research itself," do not satisfy I.R.C. § 41(b)(2)(A)(ii). (*Id.*)

⁴ The Tax Court plainly meant to cite Treas. Reg. § 1.41-2(b)(1), which provides that "indirect research expenditures" are not eligible for the research credit.

- 20 -

Further, the court opined that numerous aspects of the research credit indicate that “[r]aw materials used to make finished goods that would have been purchased regardless of whether a taxpayer was engaged in qualified research are not ‘used in the conduct of qualified research.’” (*Id.* (quoting I.R.C. § 41(b)(2)(A)(ii)).) The Tax Court concluded that the statute as a whole contradicted UCC’s expansive reading of the supply costs eligible for the research credit.

Based on the same reasoning, the Tax Court also found that UCC’s claimed wage expenses from the UCAT-J project were not qualified research expenses. It explained that “[s]ervices performed by employees for activities that would occur regardless of whether the taxpayer was engaged in qualified research are not qualified services.” (*Id.*) Accordingly, UCC could not claim the wages paid to all Star operators for operating the plant during the UCAT-J runs. (Op. 1274.)

Finally, the Tax Court found that the sodium borohydride project was not qualified research because it failed the “process of experimentation” test under I.R.C. § 41(d)(1)(C). The court explained that “to constitute a process of experimentation, the sodium borohydride project research activities must have been designed not

- 21 -

only to test whether sodium borohydride satisfied UCC's needs but to *evaluate* the use of sodium borohydride through a sequential process of experimentation." (Op. 1262 (emphasis in original).) Contrary to this standard, UCC did not "analyze[] the data it collected beyond determining that sodium borohydride reduced acetaldehyde below 100 ppm," and, in turn, could not compare the use of sodium borohydride with other alternatives. (*Id.*) It merely corroborated that sodium borohydride reduced acetaldehyde in the caustic scrubber, which was insufficient in terms of demonstrating a process of experimentation. (*Id.*)

SUMMARY OF ARGUMENT

1. The Tax Court correctly determined that UCC's supply costs to produce goods for sale were "at best, indirect research costs" excluded from the definition of "qualified research expenses" under Treas. Reg. § 1.41-2(b)(1).

"Indirect research expenses" are expenses that would have been incurred regardless of any research activities, as is made clear by I.R.C. § 41, the regulations thereunder, and the legislative history. The regulation regarding utilities, which are a subset of supply costs,

- 22 -

indicate that qualified research expenses are only the incremental costs of conducting qualified research. Accordingly, a taxpayer may not claim non-extraordinary utility costs, even if they were necessary to conduct qualified research. The purpose of the credit is to encourage increased research activities, and Congress has tailored the credit to those expenses that reflect only research activities. There is no dispute that UCC would have incurred the claimed supply costs to produce goods for sale had it not conducted the qualified research. The supply costs thus are indirect research expenses, ineligible for the credit.

UCC's argument to the contrary, that indirect research expenses are only general or administrative or overhead costs, cannot be squared with the express language of the regulation, which treat those costs separately, or with legislative intent. To embrace UCC's position would transform the research credit into a manufacturing subsidy by making it available for normal manufacturing costs.

UCC's central argument, that the claimed supply costs satisfy the statutory definition of qualified research expenses, also is incorrect. Indeed, the statutory text compels the conclusion that UCC's costs of supplies for production are not qualified research expenses. The

- 23 -

limitation on wages eligible for the credit to those paid for engaging in qualified research, the limitation on qualified research to a discrete business component, the “shrinking-back” rule used to define the relevant business component, and the rule requiring that a process for commercial production must be treated as a separate business component from the product being produced, all demonstrate that the research credit is available only for the direct cost of performing qualified research. Accordingly, the cost of supplies that are “used in the conduct of qualified research,” which they must be to qualify for the credit under I.R.C. § 41(b)(2)(A)(ii), should be similarly treated.

The Tax Court found that “[r]aw materials used to make finished goods that would have been purchased regardless of whether a taxpayer was engaged in qualified research are not ‘used in the conduct of qualified research.’” UCC directs several arguments against the Tax Court’s interpretation of the statute, but all miss the mark. The Tax Court’s interpretation is the one most consistent with the statutory text, its legislative history, case law, and policy considerations.

Finally, even if this Court were to agree with UCC’s interpretation of I.R.C. § 41(b)(2)(A)(ii), the claimed supply costs would

- 24 -

still be ineligible for the credit, because they were not reasonable expenses for research activities, as required by I.R.C. §§ 41(d)(1)(A) and 174(e), and they included non-extraordinary utility costs, ineligible for the credit under Treas. Reg. § 1.41-2(b)(2).

2. The Tax Court also correctly determined that UCC's sodium borohydride project did not constitute qualified research, because it did not satisfy the "process of experimentation" requirement of I.R.C. § 41(d)(1)(C). A process of experimentation means experimentation in the scientific sense of formulating and testing alternative hypotheses. Research to explore a single hypothesis still must be capable of evaluating alternatives. The Tax Court found the sodium borohydride project deficient in this respect, because UCC did not analyze the data collected from its test of sodium borohydride to remove acetaldehyde, and did nothing to determine its efficiency or optimal use. Rather, UCC merely confirmed that it would "work." In short, the sodium borohydride project did not follow a process of experimentation.

The decision of the Tax Court should be affirmed.

- 25 -

ARGUMENT

The Tax Court correctly concluded that UCC's costs of supplies for production were not eligible for the research credit, and that the sodium borohydride project did not constitute qualified research

Standard of review

This Court reviews the Tax Court's legal conclusions *de novo*, and its factual findings for clear error. *See Merrill Lynch & Co. v. Commissioner*, 386 F.3d 464, 469 (2d Cir. 2004). The Tax Court's determination that UCC's supply costs to produce goods for sale were not eligible for the research credit presents a legal issue as to the interpretation of the Code and the Treasury regulations, which is reviewed *de novo*. *See Field v. United States*, 381 F.3d 109, 111 (2d Cir. 2004). The Tax Court's finding that UCC's sodium borohydride project did not satisfy the process of experimentation test for qualified research presents a factual issue reviewed for clear error. *See United Stationers, Inc. v. United States*, 163 F.3d 440, 446 (7th Cir. 1998). Even if the Court treats that the second issue as presenting a mixed question of law and fact, the applicable standard of review would still be for clear error. *See Merrill Lynch*, 386 F.3d at 469; *RAPCO, Inc. v.*

- 26 -

Commissioner, 85 F.3d 950, 954 (2d Cir. 1996); *Bausch & Lomb, Inc. v. Commissioner*, 933 F.2d 1084, 1088 (2d Cir. 1991).

A. Introduction: The research credit under I.R.C. § 41

1. Tax credits are a matter of legislative grace. *New Colonial Ice Co. v. Helvering*, 292 U.S. 435, 440 (1934); *Schumacher v. United States*, 931 F.2d 650, 652 (10th Cir. 1991). They are allowed only as clearly provided for by statute, and the statute granting the credit should be narrowly construed. *Helvering v. Northwest Steel Rolling Mills, Inc.*, 311 U.S. 46, 49 (1940); *New Colonial Ice Co.*, 292 U.S. at 440; *United States v. McFerrin*, 570 F.3d 672675 (5th Cir. 2009). The taxpayer claiming the credit must clearly establish full satisfaction of all of the statutory requirements. *New Colonial Ice Co.*, 292 U.S. at 440; *see United Stationers*, 163 F.3d at 443 (“In this case [regarding the research credit under § 41], as with all claimed tax credits, the taxpayer bears the burden of showing entitlement to the credit.”); *see also* T.C. Rule 142.

2. Section 41 provides an incremental tax credit designed to encourage taxpayers to increase their research spending beyond the level that they would do absent any tax incentive. Congress believed

- 27 -

that “a substantive tax credit for incremental research and experimental expenditures will overcome the resistance of many businesses to bear the significant costs of staffing, supplies, and certain computer charges which must be incurred in initiating or expanding research programs.” H.R. Rep. 97-201, at 111 (1981), 1981-2 C.B. 352, 357; *see* H. Conf. Rep. 97-215, at 223 (1981), 1981 U.S.C.C.A.N. 285, 313 (“The conference agreement follows the House bill.”). The credit is allowed for 20 percent of the increase in “qualified research expenses” over the “base amount.”⁵ I.R.C. § 41(a).

“Qualified research expenses” include both the cost of qualified research conducted by a taxpayer in-house, and the cost of contract research paid by a taxpayer to another party for qualified research. I.R.C. § 41(b). At issue in this case is the first category of research expenses.

“In-house research expenses” means, in relevant part, “any wages paid or incurred to an employee for qualified services,” *i.e.*, the

⁵ A taxpayer’s “base amount” is generally its average annual gross receipts for the four preceding tax years multiplied by its “fixed-base percentage,” which is the lesser of 16 percent or the fraction of the taxpayer’s aggregate “qualified research expenses” over its aggregate gross receipts for the 1984 through 1988 tax years. I.R.C. § 41(c).

- 28 -

performance or direct supervision of qualified research, and “any amount paid or incurred for supplies used in the conduct of qualified research.”⁶ I.R.C. § 41(b)(2)(A), (B). Congress intended to make the research credit available only for expenses incurred “in the actual conduct of research,” and not for indirect research expenses, and general and administrative costs. H.R. Rep. 97-201, at 117-18, 1981-2 C.B. at 361. Congress expressly stated that the definition of “qualified research expenses” *excludes* “wages paid to officers and employees of the taxpayer who are not engaged in the conduct of research although engaged in activities (such as general supervision of the business or raising capital for expansion) which in some manner may be viewed as benefitting research activities,” or supply costs “if such expenditures constitute indirect research expenditures, or if such expenditures constitute or are part of general and administrative costs or overhead costs (such as utilities).”⁷ *Id.*; see Treas. Reg. § 1.41-2(b)(1)

⁶ “Supplies” are tangible property other than real property and property of a character that may be depreciated. I.R.C. § 41(b)(2)(C).

⁷ The Staff of the Joint Committee on Taxation explained that, “in order to limit the credit to principal types of research expenditures which distinctly reflect the extent of increased research activities, the credit is
(continued...)

- 29 -

(“Expenditures for supplies . . . that are indirect research expenditures or general or administrative research expenses do not qualify as inhouse research expenses.”); *see also* Treas. Reg. § 1.41-2(b)(2) (utilities); Treas. Reg. § 1.41-2(c)(3) (wages).

After the original enactment of the credit, Congress narrowed the definition of “qualified research.” As is apparent from the previous discussion of qualified research expenses, whether a taxpayer is entitled to claim expenses as qualified research expenses turns mainly on the scope of the qualified research that was performed. Section 41 was originally enacted in 1981 as § 44F of the Internal Revenue Code of 1954, which provided that “‘qualified research’ has the same meaning as the term research or experimental has under Section 174.” Economic Recovery Tax Act of 1981, Pub. L. 97-34, § 221, 95 Stat. 172, 241-47. The definition of “research and experimental” in the regulations under I.R.C. § 174 was somewhat imprecise, but was

⁷(...continued)

limited to certain direct wage, supply, and equipment research expenditures The credit is not allowed for other types of research expenditures, or for indirect, administrative, or overhead expenditures.” Staff of the Joint Comm. on Taxation, 97th Cong., 1st Sess., General Explanation of the Economic Recovery Tax Act of 1981, at 120 (J. Comm. Print 1981).

- 30 -

adequate for deduction purposes because many of the expenses deductible under I.R.C. § 174 as research expenses also were deductible under I.R.C. § 162 as ordinary and necessary business expenses. *See* H.R. Hrg. 98-102, at 26 (1984) (statement of Ronald A. Pearlman, Asst. Sec. Tax Policy, Dept. of Treasury). Thus, the imprecision had little practical effect. For credit purposes, however, it created a windfall. Congress found that the definition of “qualified research” under the research credit “has been applied too broadly in practice, and some taxpayers have claimed the credit for virtually any expenses relating to product development.” H.R. Rep. No. 99-426, at 178 (1985), 1986-3 (vol. 2) C.B. 1, 178; S. Rep. No. 99-313, at 694-95 (1986), 1986-3 (vol. 3) C.B. 1, 694-95.

The Department of the Treasury (“Treasury”) recommended, among other things, that Congress amend the definition of “qualified research” to require delineating the particular “business component” to which the research relates: “We think that focusing on the particular component which is substantially improved would prevent routine product development costs from qualifying for the credit.” S. Hrg. 98-843, at 76 (1984) (statement of John Chapoton, Asst. Sec. Tax Policy,

- 31 -

Dept. of Treasury); *see* H.R. Hrg. 98-102, at 29 (statement of Mr. Pearlman) (“The term ‘business component’ is designed to focus on the particular components of a product to which the R&E activities relate. This will prevent routine product development cost from qualifying for the credit.”). The following example illustrated this point:

[I]f a taxpayer were going to develop a new personal computer, but combines existing widely available component parts in the development of the computer, except that he develops an entirely new type of screen which would cause less eye strain and produce better graphics, and incurs substantial R&E expenditures in the development of the screen and substantial engineering costs in combining the various parts in developing the new computer, we would think that the cost of developing the entire computer would not qualify for the credit, but the cost of the substantial improvement in the screen would qualify for the credit.

S. Hrg. 98-843, at 76 (statement of Mr. Chapoton). Congress’s amendment of the research credit in the Tax Reform Act of 1986 (“1986 Act”), Pub. L. 99-514, § 231(b), 100 Stat. 2085, 2173-74, reflects this advice.⁸

⁸ Congress also redesignated the research credit as § 41 of the Code, and extended the sunset date for the credit for three years from 1986 to 1989. 1986 Act, § 231(a), (d), 100 Stat. at 2173, 2178. The credit never has been made permanent; instead, Congress repeatedly extended the availability of the credit, without interruption, until June 30, 1995.

The credit expired on June 30, 1995, and was renewed prospectively on

(continued...)

- 32 -

In the 1986 Act, Congress defined “qualified research,” as in effect during the years at issue here, as research that satisfies each of four tests and does not fall within the categories of activities for which the research credit is not available. The four tests of qualified research are as follows: First, the expenses incurred in the research must be treatable as expenses under I.R.C. § 174, which governs the tax accounting treatment of research and experimental expenditures. I.R.C. § 41(d)(1)(A). Second, the research must have been undertaken for the purpose of discovering information that is technological in nature. I.R.C. § 41(d)(1)(B)(i). Third, the application of that information must be intended to be useful in the development of a new or improved business component of the taxpayer. I.R.C. § 41(d)(1)(B)(ii). Fourth, substantially all of the research activities must have constituted elements of a process of experimentation. I.R.C. § 41(d)(1)(C). As relevant here, among the activities excluded from

⁸(...continued)

January 1, 1996. *See* Small Business Job Protection Act of 1996, Pub. L. 104-88, § 1204(a), 110 Stat. 1755, 1773. UCC has acknowledged that it is not entitled to any credit based on expenses incurred during the six-month period when the credit was not in effect. (Op. 1214; A136 ¶ 15.)

- 33 -

qualified research is research conducted after the beginning of commercial production of the business component. I.R.C. § 41(d)(4)(A).

The qualified research tests apply separately with respect to each “business component” of the taxpayer, which is a “product” or “process” for sale, lease, or license to third parties, or used by the taxpayer in its trade or business. I.R.C. § 41(d)(2)(A), (B). Congress explained that the “qualified research” tests apply first to the entire product or process, and, if all of the tests are not met, then to increasingly narrow subsets of elements of the product or process. “This ‘shrinking back’ of the product is to continue until either a subset of elements of the product that satisfies the requirements is reached, or the most basic element of the product is reached and such element fails to satisfy the test.” H. Conf. Rep. 99-841 (vol 2.), at II-73 (1986), 1986 U.S.C.C.A.N. 4075, 4161; *see* Treas. Reg. § 1.41-4(b)(2) (memorializing the “shrinking-back” rule). The “business component” is “the most significant set of elements of such product, etc. with respect to which all requirements are met.” H. Conf. Rep. 99-841 (vol. 2), at II-73, 1986 U.S.C.C.A.N. at 4160. Specifically with respect to a “plant process . . . for commercial production of a business component,” such process is a

- 34 -

separate business component from the product being produced. I.R.C. § 41(d)(2)(C).

B. The Tax Court correctly disallowed the claimed supply costs

1. The cost of supplies used to produce goods for sale were “indirect research expenses,” excluded from the definition of “qualified research expenses” under Treas. Reg. § 1.41-2(b)(1)

“Qualified research expenses” include “any amount paid or incurred for supplies used in the conduct of qualified research.” I.R.C. § 41(b)(2)(A)(ii). Section 1.41-2(b)(1) of the Treasury regulations provides that “[e]xpenditures for supplies . . . that are indirect research expenditures or general and administrative expenses do not qualify as [qualified] research expenses.” UCC’s claimed supply costs were, as the Tax Court recognized, “at best, indirect research costs” excluded from the definition of “qualified research expenses” under the regulation.

(Op. 1273.)

a. As an initial matter, UCC does not challenge the validity of Treas. Reg. § 1.41-2(b)(1). And there is no doubt that the regulation falls within the Treasury’s “gap-filling” authority.” *Mayo Found. for Med. Educ. & Research v. United States*, 131 S. Ct. 704, 714 (2011)

- 35 -

(quoting *Long Island Care at Home, Ltd. v. Coke*, 551 U.S. 158, 173 (2007)). Section 41 defines “qualified research expenses” in terms of expenses incurred to perform qualified research, which supports the regulation’s exclusion of “indirect research expenditures or general and administrative expenses.” Congress made it clear in enacting the credit that “the credit is not available for expenditures for supplies . . . if such expenditures constitute indirect research expenditures, or if such expenditures constitute or are part of general and administrative costs or overhead costs (such as utilities).” H.R. Rep. 97-201, at 117-18, 1981-2 C.B. at 362. The regulation embodies Congress’s express intent. Moreover, Congress generally delegated to the Treasury the authority to make rules carrying the force of law under I.R.C. § 7805(a), which the Treasury exercises when it promulgates regulations. *See Mayo Found.*, 131 S. Ct. at 713-14.

b. Supply costs are “indirect research expenditures” if they would have been incurred regardless of any research activities. Section 1.41-2(b)(2) of the Treasury regulations, regarding utility supply costs, is instructive in this regard. Under the regulation, utility costs are not qualified research expenses unless “the special character of the

- 36 -

qualified research required additional extraordinary expenditures for utilities,” in which case “the additional expenditures shall be treated as amounts paid or incurred for supplies used in the conduct of qualified research.” Treas. Reg. § 1.41-2(b)(2). Simply put, utility costs are qualified research expenses only if they are incurred because of research activities, *i.e.*, if the research activities are the but-for cause. Among the supply costs claimed by UCC were the costs of fuel used to fire the furnaces, and the refrigeration in the olefins production process. (Op. 1236; A793-94, A825-32.) These supplies were consumed in the course of “normal” commercial production according to the Tax Court (Op. 1273), and UCC (Br. 39), and their cost was not extraordinary. It follows that these supply costs were not qualified research expenses.⁹ More broadly, utility costs illustrate that qualified research expenses are costs incurred because of qualified research. The

⁹ Having determined that all of UCC’s claimed supply costs were indirect research expenses, and thus ineligible for the credit under Treas. Reg. § 1.41-2(b)(1), the Tax Court declined to reach the Commissioner’s alternative arguments that the claimed supply costs also were ineligible because they were, in part, non-extraordinary utility costs, and because they were unreasonable. (Op. 1274 n.52.) We reiterate both arguments here, *infra* 64-66, but in the event this Court reverses the Tax Court, a remand would be necessary for that court to consider them in the first instance.

- 37 -

phrase “indirect research expenditures” in Treas. Reg. § 1.41-2(b)(1) refers to those supply costs, akin to non-extraordinary utility costs, that would have been incurred regardless of any research activities, and are therefore ineligible for the research credit.

The exclusion of indirect expenses comports with the fundamental purpose of the research credit to encourage increased research activities. Congress intended to provide “a substantive tax credit for incremental research and experimental expenditures.” H.R. Rep. 97-201, at 111, 1981-2 C.B. at 358; *see* Staff of the Joint Comm. on Taxation, General Explanation of the Economic Recovery Tax Act of 1981, at 120 (stating that the aim of the research credit was to limit the eligible costs to those that “distinctly reflect the extent of increased research activities”); 135 Cong. Rec. S24331 (Oct. 12, 1989) (Senate Finance Committee Report on Title VI, Revenue Reconciliation Act of 1989, Subtitle A, Extensions of Certain Expiring Tax Provisions) (proposing an amendment to “maximize the credit’s efficiency by not allowing (to the extent possible) credits for research that would have been undertaken in any event”). In short, expenses eligible for the

- 38 -

credit do not include those that a taxpayer would have incurred in any event.

Indeed, when Congress originally enacted the research credit, it indicated that such expenses do not constitute qualified research expenses. Congress stated that supply costs and wage expenses are governed by the same principles as to eligibility for the research credit, and “[a] taxpayer’s wage expenditures enter into the credit computation only to the extent that they constitute wages paid or incurred for qualified services.” H.R. Rep. 97-201, at 117-18, 1981-2 C.B. at 361. In particular, “no amount of overhead, general and administrative, or indirect wage expenditures is eligible for the new credit, even if such expenditures relate to the taxpayer’s research activities, and even if such expenditures may qualify for section 174 deduction elections or may be treated as research expenditures for accounting and financial purposes.” *Id.* It is insufficient that a taxpayer’s wage expenses correspond to employee activities that “may be viewed as benefitting research activities.” *Id.* Rather, wage expenses are eligible for the research credit, as are supply costs, only if they have been incurred *because of* the research activities.

- 39 -

The statute reflects this limitation. Qualified research expenses constitute expenses incurred to perform qualified research, *i.e.*, “engaging in qualified research” or “the direct supervision or direct support of . . . qualified research,” and the cost of supplies to “conduct . . . qualified research.” I.R.C. § 41(b)(2)(A)(i), (ii), (B)(i). Expenses that would have been incurred regardless of the performance of “qualified research” do not meet this standard.

Moreover, since the original enactment of the research credit, Congress has guarded against the credit being allowed for routine expenses. Upon learning that the research credit “has been applied too broadly in practice,” Congress amended it to require that “qualified research” satisfy each of four tests applied “separately with respect to each business component,” which, in the case of production research, means separately to the “plant process . . . for commercial production,” and the product “being produced.” I.R.C. § 41(d)(1), (2); H.R. Rep. No. 99-426, at 178, 1986-3 (vol. 2) C.B. at 178; S. Rep. No. 99-313, at 694-95, 1986-3 (vol. 3) C.B. at 694-95. A taxpayer therefore cannot channel non-research expenses into the credit calculation by claiming the credit for the entire cost of a commercial process and/or product

- 40 -

when the “qualified research” involved only one aspect. *See* S. Hrg. 98-843, at 76 (statement of Mr. Chapoton) (stating that the “business component” focus “would prevent routine product development costs from qualifying for the credit”); *see also* H.R. Hrg. 98-102, at 29 (statement of Mr. Pearlman).

The supply costs at issue here are the paradigm of indirect research expenditures; UCC would have incurred them to produce goods for sale, regardless of the Amoco anti-coking project and the UCAT-J project. They consisted entirely of “ordinary production costs.” (Op. 1274.) As noted by the Tax Court, UCC “had ample opportunity to establish that it incurred additional supply QREs [qualified research expenses] for the claimed products,” but declined to do so. (*Id.*) And UCC did not allocate its supply costs between production costs and the additional costs to conduct the research, such as the additional cost of using UCAT-J instead of its established M-1 catalyst. (*Id.*) UCC does not challenge these findings. There is no dispute that UCC would have incurred the same (if not higher) supply costs had it not conducted any research activities.

- 41 -

UCC argues, as do the amici curiae, that “when a manufacturer decides to use [production] supplies to conduct plant-based research, it inherently places those supplies at risk.” (Br. 40; *see* Am. Br. 14-18.) Whatever the merit of this assertion as an abstract matter, UCC does not contend that it incurred any additional supply costs based on its research activities, and it could not credibly do so. There is no evidence that UCC’s production suffered in the least as a result of the Amoco anti-coking project. UCC notes that the pretreatments proved unsuccessful (Br. 39-40), but that only meant that the Amoco technology did not inhibit the formation of coke that occurred as a matter of course. In other words, the technology failed to mitigate an existing problem. Moreover, during the tests, UCC conducted “hot decokes” and “cold turnarounds,” when it replaced cracking coils and removed coke from the TLE system, as it normally did. (Op. 1215, 1217.) As summarized by the Tax Court, “the Amoco anticoking project did not disrupt UCC’s normal manufacturing processes or products.” (Op. 1217.) It therefore did not cause UCC to incur additional supply costs.

- 42 -

There also is no evidence that UCC incurred additional supply costs as a result of the UCAT-J project. Indeed, the evidence indicates that those costs actually decreased. UCC emphasizes that the UCAT-J runs produced off-grade material. (Br. 40.) But, as the Tax Court recognized, the production of off-grade material is the norm. (Op. 1225; A888.) Notwithstanding the production of off-grade material when it used UCAT-J, UCC lowered its cost of production as compared with production runs of the same base resins using the M-1 catalyst. On March 12, 1996, UCC reported that “[s]o far, Star has demonstrated an average cost savings of 0.28¢/lb on molding resins and 0.25¢/lb on film resins based on an incremental cost difference between UCAT™-A and UCAT™-J of \$4.78/lb.” (RSA5.) A significant part of UCAT-J’s appeal was its promised savings on production costs, and it delivered on that promise.

c. UCC misconstrues Treas. Reg. § 1.41-2(b)(1) in stating that indirect research expenses are “only general or administrative or overhead costs.” (Br. 60.) UCC ignores the terms of the regulation, which distinguishes “indirect research expenditures” from “general and administrative expenses” by the disjunctive “or” placed between them.

- 43 -

Treas. Reg. § 1.41-2(b)(1). They are separate categories of expenses, and UCC improperly reads the former category out of the regulation.

UCC's reliance on legislative history repeats this mistake.

Congress intended that supply costs would not be eligible for the credit "if such expenditures constitute indirect research expenditures, *or* if such expenditures constitute or are part of general and administrative costs or overhead costs (such as utilities)." H.R. Rep. 97-201, at 118, 1981-2 C.B. at 362 (emphasis added). Plainly, Congress did not intend to exclude only general and administrative or overhead costs.

UCC further misreads this legislative history as reflecting the principle that the research credit is available for any costs that are "instrumental, and not incidental, to the conduct of [qualified research]." (Br. 60.) But Congress intended to exclude non-extraordinary utility costs, and indirect wage and supply expenses, "even if such expenditures relate to the taxpayer's research activities." H.R. Rep. 97-201, at 117-18, 1981-2 C.B. at 361. Such costs were "instrumental" to the Amoco anti-coking project and the UCAT-J project. The plants, for example, could not have operated without incurring utility costs and wage expenses of operating personnel, just

- 44 -

as the plants could not have operated without incurring the cost of supplies for production. Congress did not intend that any of these expenses would qualify for the research credit, however, because they do not reflect the direct, incremental costs of conducting the research activities. This incremental cost principle, and not the “instrumental” cost principle advanced by UCC, articulates what costs are eligible for the research credit. UCC appears to acknowledge this at least partially. For example, it does not claim all utility costs, or the wages paid to plant operators, even though they were “instrumental” to operating the plants during the research projects.¹⁰ These expenses were not eligible for the research credit because UCC would have

¹⁰ In the Tax Court, UCC argued that it was entitled to claim as “qualified research expenses” wages paid to Star Plant operators attributable to plant operations during the UCAT-J runs. (Op. 1237; A791.) The Tax Court disagreed, because merely operating the plant did not mean that employees were engaged in qualified research, despite the fact that normal operations were “instrumental” to conducting the UCAT-J runs. Specifically, the Tax Court stated that, in general, “[s]ervices performed by employees for activities that would occur regardless of whether the taxpayer was engaged in qualified research are not qualified services,” and that, with respect to UCC’s claim in particular, UCC “has not provided any evidence that shows how much time Star’s plant employees actually spent on the UCAT-J project.” (Op. 1273, 1275.) UCC has not appealed this determination.

- 45 -

incurred them anyway to produce goods for sale. The same is true of the claimed supply costs.

UCC's interpretation of Treas. Reg. § 1.41-2(b)(1) as implementing an "instrumental" cost standard would eviscerate the limits on costs eligible for the credit in the context of plant research, and transform the role of the research credit from encouraging increased research spending, as Congress intended, to subsidizing operations, which Congress sought to avoid. Because a plant must be running normally to conduct plant-based research, under UCC's reasoning, all the costs of operation are eligible for the credit. The fundamental purpose of the credit, however, is to the contrary. Congress enacted the credit as an "incentive[] for greater private activity in research," and it is not allowable for operating expenses that are incidental to the performance of research activities and would have been incurred in any event. H.R. Rep. 97-201, at 111, 1981-2 C.B. at 358.

- 46 -

2. UCC’s argument that the claimed supply costs satisfy the relevant definition of “qualified research expenses” under I.R.C. § 41(b)(2)(A)(ii) is flawed

UCC’s central argument is that the claimed supply costs were “qualified research expenses” because the supplies were “used in the conduct of qualified research” for purposes of I.R.C. § 41(b)(2)(A)(ii). (Br. 32-34.) Echoing its interpretation of Treas. Reg. § 1.41-2(b)(1), UCC contends that supplies meet the terms of the statute if they are “necessary” to conduct such research. (Br. 34.) As already discussed, UCC’s proposed “instrumental” or “necessary” cost standard is flawed. It cannot be squared with Treas. Reg. § 1.41-2, which is indisputably valid, or with the statute and its legislative history, which establish that non-extraordinary utility expenses, and indirect wage and supply expenses, albeit necessary, are not qualified research expenses.

a. Questions of statutory interpretation turn on “the language itself, the specific context in which that language is used, and the broader context of the statute as a whole.” *Nken v. Holder*, 129 S. Ct. 1749, 1756 (2009) (quoting *Robinson v. Shell Oil Co.*, 519 U.S. 337, 341 (1997)). As expressed by this Court, “[s]tatutory construction . . . is a holistic endeavor.” *Auburn Housing Auth. v. Martinez*, 277 F.3d 138,

- 47 -

144 (2d Cir. 2002) (quoting *United Sav. Ass'n of Texas v. Timbers of Inwood Forrest Assocs., Ltd.*, 484 U.S. 365, 371 (1988)); see 2A Norman J. Singer & J.D. Shambie Singer, *Statutes & Statutory Construction* § 46:5, at 154 (7th ed. 2007) (“[I]t is not proper to confine interpretation to the one section to be construed.”). “The meaning of statutory language, plain or not, depends on context.” *Bailey v. United States*, 516 U.S. 137, 145 (1995) (quoting *Brown v. Gardner*, 513 U.S. 115, 118 (1994)). Accordingly, in ascertaining the meaning, “the text is only the starting point.” *Auburn Housing Auth.*, 277 F.3d at 143 (quoting *In re Boodrow*, 126 F.3d 43, 49 (2d Cir. 1997)).

This fundamental approach to statutory interpretation as applied here leads to the conclusion that the supplies at issue were not “used in the conduct of qualified research” for purposes of I.R.C. § 41(b)(2)(A)(ii). The various dictionary definitions of the word “use” include “to carry out a purpose or action by means of.” *Webster’s New International Dictionary* 2524 (3d ed. 1966). UCC did not use the supplies in the conduct of qualified research to the extent the supplies were not the means by which UCC carried out the qualified research. The supplies were the means by which it carried out the production of goods for sale

- 48 -

without regard to the performance of any qualified research. UCC performed the qualified research in addition to its normal production process. The Tax Court framed it thus: UCC “seeks to include as QREs amounts incurred during the production process upon which the qualified research was conducted, not during the conduct of the qualified research itself.” (Op. 1273.) It is linguistically possible to read “used” more broadly to mean “to put into action or service,” *Webster’s New International Dictionary*, at 2523, in which case the phrase “used in the conduct of qualified research” would encompass all of the supplies necessary to conduct qualified research, regardless of whether the supplies were used in the actual conduct of qualified research. That reading, however, is contrary to the principle that federal income tax credits should be construed narrowly. *See Northwest Steel*, 311 U.S. at 49. And it takes the phrase out of context. As explained by the Tax Court (Op. 1273), the provision has a narrower meaning in light of the statute as a whole.

As noted above, I.R.C. § 41 in several places excludes routine expenses – *i.e.*, expenses that would be incurred regardless of any research activities – from eligibility for the research credit. The

- 49 -

definition of “qualified research expenses” includes wages paid to an employee for performing “qualified services,” which requires that the employee be “engag[ed] in” qualified research or the direct supervision of qualified research, and not merely necessary to such research. I.R.C. § 41(b)(2)(A)(i), (B). The definition of “qualified research” requires delineating the “business component” to which the research relates. I.R.C. § 41(d)(2)(A). The “shrinking-back” rule, which Congress described in the legislative history of the statute, and which has been codified by regulation, ensures that the business component is commensurate with the scope of the qualified research, so that non-qualifying activities do not factor into the credit. Treas. Reg. § 1.41-4(b)(2). Finally, a commercial production process must be treated as a separate business component from the product. I.R.C. § 41(d)(2)(C). This special rule for production processes is particularly relevant in the context of plant research because, as the Tax Court explained, it “indicates that Congress intended to allow taxpayers research credits for research performed to improve their production processes, but Congress did not intend for all of the activities that were associated with the production process to be eligible for the research credit if the

- 50 -

taxpayer was performing research only with respect to the process, not the product.” (Op. 1273.)

The bottom line is that the research credit is designed to be available only for the direct cost of performing qualified research, exclusive of other activity costs. The statute as a whole makes it clear that I.R.C. § 41(b)(2)(A)(ii), which addresses the supply costs available for the research credit, should be construed in the same manner. *See United States v. Cleveland Indians Baseball Co.*, 532 U.S. 200, 217-18 (2001) (“[T]he meaning of a provision is ‘clarified by the remainder of the statutory scheme when only one of the permissible meanings produces a substantive effect that is compatible with the rest of the law.’”) (quoting *United Sav. Assn. of Tex.*, 484 U.S. at 371); *see also Frank G. v. Bd. of Educ. of Hyde Park*, 459 F.3d 356, 371 (2d Cir. 2006). Moreover, the legislative history confirms this construction. Congress explained that supply costs are eligible for the research credit in accordance with the rules that govern eligibility of wage expenses, and “[a] taxpayer’s wage expenditures enter into the credit computation only to the extent that they constitute wages paid . . . for engaging in the actual conduct of research (as in the case of a laboratory scientist

- 51 -

engaging in experimentation).” H.R. Rep. 97-201, at 117-18, 1981-2 C.B. at 361. Congress thus made it clear that indirect supply costs and non-extraordinary utility costs do not satisfy the terms of the research credit. *Id.* UCC’s expansive reading of the phrase “used in the conduct of qualified research” under I.R.C. § 41(b)(2)(A)(ii) cannot be squared with Congressional intent.

b. The foregoing interpretation of I.R.C. § 41(b)(2)(A)(ii) parallels the Tax Court’s, which UCC criticizes in several respects. First, UCC argues that the Tax Court effectively rewrote I.R.C. § 41(b)(2)(A)(ii). (Br. 34-37.) Second, it argues that the Tax Court’s interpretation of I.R.C. § 41(b)(2)(A)(ii) contradicts the relevant legislative history. (Br. 37-38.) Third, it maintains that the Tax Court improperly disallowed the claimed supply costs based on I.R.C. § 41(d)(2)(C). (Br. 47-49.) These arguments lack merit.

i. UCC mischaracterizes the Tax Court’s opinion in stating that “the Tax Court added the word ‘primarily’ to modify the word ‘used’” in I.R.C. § 41(b)(2)(A)(ii), and determined that when supplies are used to both produce goods for sale and conduct plant research on the production process, they are “primarily” used to do the former. (Br. 35.)

- 52 -

What the Tax Court, in fact, determined was that “[r]aw materials used to make finished goods that would have been purchased regardless of whether a taxpayer was engaged in qualified research are not ‘used in the conduct of qualified research.’” (Op. 1273.) Simply put, I.R.C.

§ 41(b)(2)(A)(ii) captures the direct, incremental supply costs of performing qualified research, which indisputably does not include the supply costs at issue here.¹¹ Supplies must be used in the actual conduct of qualified research, not merely used in the production process upon which the qualified research was conducted. As detailed above, this interpretation is compelled by the language of I.R.C.

§ 41(b)(2)(A)(ii) viewed in the context of the statute as a whole, and does not reflect a departure from that language as UCC contends.

¹¹ The Tax Court further noted that the research credit is an incentive for taxpayers to incur additional research expenses, but could not have played such a role here because UCC did not consider the costs of supplies for production as qualified research expenses at the time that it carried out the Amoco anti-coking and the UCAT-J projects. (Op. 1274.) Rather, it reported them as cost of goods sold. (Op. 1214; A208 ¶ 1083.) UCC argues that there was nothing improper about claiming such costs years later in a Tax Court petition. (Br. 61.) But that misses the point. As explained by the Tax Court, “[p]roduction costs that UCC would have incurred without the incentive of the research credit are not the types of costs that Congress sought to target when it enacted the research credit.” (Op. 1274.)

- 53 -

ii. UCC also mischaracterizes the legislative history of the credit. UCC contends that Congress intended the credit to be broad and inclusive in terms of its definition of eligible supply costs. (Br. 37-38.) But the legislative history shows precisely the opposite. And UCC does not refer to Congress's efforts to limit the supply costs eligible for the credit. Drafts of the research credit, prior to enactment, did not include supply costs within the definition of "qualified research expenses." Senator Danforth co-sponsored the amendment to add supply costs, which passed with his assurance that the amendment would have "little or no revenue effect." 127 Cong. Rec. S17458 (daily ed. July 27, 1981). Consistent with that assessment, upon the original enactment of the credit, Congress described the supply costs eligible for the credit in narrow terms, exemplified by the exclusion of indirect supply costs. *See* H.R. Rep. 97-201, at 117-18, 1981-2 C.B. at 361.

Congress also amended the definition of "qualified research" to prevent taxpayers from applying the research credit too broadly. *See* H.R. Rep. No. 99-426, at 178, 1986-3 (vol. 2) C.B. at 178; S. Rep. No. 99-313, at 694-95, 1986-3 (vol. 3) C.B. at 694-95. Among other things, the amendment applied the tests of qualified research at the level of

- 54 -

the individual business component. I.R.C. § 41(d)(1), (2). The Treasury recommended focusing on the business component to prevent taxpayers from claiming the research credit for the entire cost of developing a product and/or process when the qualified research involved only one aspect. *See* S. Hrg. 98-843, at 76 (statement of Mr. Chapoton); H.R. Hrg. 98-102, at 29 (statement of Mr. Pearlman). UCC therefore erroneously suggests that the shrinking-back rule, which narrows the business component, reflects Congress's inclusive view of the supply costs eligible for the credit. (Br. 38 n.5.) The shrinking-back rule is designed to keep taxpayers from channeling routine expenses into the credit calculation. The same is true of the rule under I.R.C. § 41(d)(2)(C) that the process for commercial production and the product must be treated as separate business components.

iii. Finally, UCC incorrectly contends that the Tax Court disallowed the claimed supply costs based on I.R.C. § 41(d)(2)(C) (Br. 47-51), instead of on I.R.C. § 41(b)(2)(A)(ii) (and Treas. Reg. § 1.41-2(b)(2)), which excludes from the definition of "qualified research expenses" the cost of supplies that "would have been purchased regardless of whether a taxpayer was engaged in qualified research"

- 55 -

(Op. 1273). The Tax Court expressly found that supplies of this type, including those at issue here, are not “used in the conduct of qualified research” for purposes of I.R.C. § 41(b)(2)(A)(ii). (*Id.*)

In this respect, the Tax Court viewed I.R.C. § 41(d)(2)(C) as indicative of Congress’s intent to exclude from eligibility expenses that would have been incurred regardless of any research activities.

Consistent with that intent, the Tax Court narrowly construed the phrase “used in the conduct of qualified research” in I.R.C.

§ 41(b)(2)(A)(ii). The Tax Court further recognized the particular relevance for manufacturing plant research of the distinction in I.R.C. § 41(d)(2)(C) between production process and product because, unlike laboratory or pilot-plant research, manufacturing plant research necessarily involves both. When manufacturing plant research relates only to one component, under I.R.C. § 41(b)(2)(A)(ii), only the supplies used to conduct the research, and not all the supplies used to operate the plant, are eligible for the credit. The Tax Court properly disallowed UCC’s claimed supply costs on this basis.

c. UCC argues that “[o]ther courts have *not* denied QRE treatment to the cost of supplies used to conduct research on the

- 56 -

ground that the research resulted in the production of product.” (Br. 41 (emphasis in original).) This, too, misses the point. In each of the cases cited by UCC, the supply costs found to be eligible for the credit were the direct, incremental cost of performing the qualified research. See *Trinity Indus. v. United States*, 691 F. Supp. 2d 688, 697 (N.D. Tex. 2010) (reasoning that where the construction of a prototype ship is qualified research, the cost of construction is a qualified research expense); *TG Missouri Corp. v. Commissioner*, 133 T.C. 278, 297 (2009) (finding that amounts paid to third-party toolmakers for their role in the qualified research of developing production molds were supply costs eligible for the research credit); *Lockheed Martin Corp. v. United States*, 49 Fed. Cl. 241, 245-46 (2001) (declining to decide whether missile components were supplies used in the conduct of qualified research to develop the missile); *Fudim v. Commissioner*, 67 T.C.M. (CCH) 3011, 3011-2, 3012 (1994) (finding that the taxpayer’s business was “primarily engaged in researching a process known as ‘rapid modeling,’” and that the supplies at issue were used to conduct that research). Therefore, these cases are entirely consistent with the Tax Court’s interpretation of what supply costs are eligible for the credit

- 57 -

under I.R.C. § 41(b)(2)(A)(ii). The fact that the taxpayers in some cases sold the product produced by their qualified research is irrelevant.

UCC relies on *TG Missouri* for the additional reason that there the Tax Court did not address whether the qualified research was product or process research, while it did so here. (Br. 42-43.) On this basis, UCC contends that the Tax Court opinions “cannot be reconciled.” (Br. 42.) But the distinction between product and process research was irrelevant in the context of *TG Missouri*.¹² The development of production molds at issue in that case did not involve the production of any injection-molded products or any other activities not considered qualified research. Whether the development of production molds was product or process research made no difference.

In contrast, UCC’s activities involved the production process and the production of goods for sale, which, under I.R.C. § 41(d)(2)(C), were required to be treated as separate business components. It is

¹² The only issue before the Tax Court in *TG Missouri* was whether the production molds were supplies subject to depreciation for purposes of the research credit. *See* 133 T.C. at 279. The issue here, whether supplies were “used in the conduct of qualified research” under I.R.C. § 41(b)(2)(A)(ii), was not squarely before the court in that case.

- 58 -

undisputed that UCC did not, and could not, perform qualified research on the products being commercially produced.¹³ See I.R.C. § 41(d)(4)(A)

¹³ UCC's position below was that the research projects related to the production process, and not the end products. (Op. 1257, 1274.) The Tax Court agreed, adding that "the evidence clearly indicates that to the extent that UCC was conducting research on its end products its activities would be excluded from the definition of qualified research under section 41(d)(4)(A) as research after commercial production because all of the products UCC produced during the claim projects satisfied UCC's functional and economic requirements." (Op. 1274.) On appeal, however, UCC argues that the UCAT-J project was product research because its "scrap output can hardly be said to have 'satisfied UCC's function and economic requirement.'" (Br. 41 n.7.) That argument should be considered waived, especially given that it contradicts UCC's own prior affirmative position. See *Millea v. Metro-North R.R.*, 658 F.3d 154, 163 (2d Cir. 2011) ("Arguments raised for the first time on appeal are deemed waived."). In any event, the production of off-grade polyethelene resin was par for the course, and so casts no doubt on the Tax Court's conclusion that such products were in commercial production. Moreover, the cost of production of even off-grade resin was not "of an investigative nature expended in developing the *concept* of a model or product." *Mayrath v. Commissioner*, 41 T.C. 582, 590 (1964) (emphasis in original) (applying I.R.C. § 174). Indeed, UCC sought to produce resins using UCAT-J equivalent to those using M-1. (A888; A1594 Tr. 1611.) Therefore, as the Tax Court recognized (Op. 1274), UCC's production costs would not have been qualified research expenses, even absent the exclusion of research after commercial production. See generally *Norwest Corp. v. Commissioner*, 110 T.C. 454, 491 (1998) ("We believe that the phrase 'the research expenditure may be treated as expenses under section 174' [under I.R.C. § 41(d)(1)(A)] is meant to require the taxpayer to satisfy all of the elements for a deduction under section 174.").

- 59 -

(“The term ‘qualified research’ shall not include . . . [a]ny research conducted after the beginning of commercial production of the business component.”). Therefore, here, unlike in *TG Missouri*, the supply costs incurred were not necessarily for supplies “used in the conduct of qualified research.” And here, the nature of the qualified research matters in determining what supplies were eligible for the research credit.

d. Finally, UCC and the amici curiae erroneously accuse the Tax Court of discriminating against qualified research of production processes (Br. 51-59; Am. Br. 10-14, 20-24). With respect to both process and product research, the research credit allows as qualified research expenses the direct, incremental cost of performing qualified research. This means, as the Tax Court recognized, that qualified research expenses do not include “the costs of supplies that would have been purchased and wages attributable to services that would have been provided regardless of whether research was being conducted.” (Op. 1273.) Supplies used regardless of the conduct of qualified research are not “used in the conduct of qualified research” for purposes of I.R.C. § 41(b)(2)(A)(ii). (*Id.*) What UCC and the amici curiae

- 60 -

essentially argue is that, when it comes to process research, supply costs should be subject to a broader standard. To adopt such a position would transform the research credit into a manufacturing subsidy.

UCC argues, contrary to the statute, that “[t]he Tax Court’s process/product distinction . . . is artificial and unworkable.” (Br. 52; *see also* Am Br. 10-14.) But I.R.C. § 41(d)(2)(C) provides that a plant process for commercial production and the product being produced are separate business components. Accordingly, qualified research at the plant level is either process research or product research, or both. *See* Treas. Reg. § 1.41-4(b). A court cannot simply disregard the distinction between process and product when an activity involves both.

Moreover, there is no indication that the distinction between process and product is “artificial” or “unworkable.” UCC contends that the distinction is nothing more than a “label,” and points to the UCAT-J project as proof. (Br. 52-53.) The Tax Court found that the UCAT-J project related to the improvement of UCC’s polyethelene production process (Op. 1262), but UCC insists that “it could just as easily have characterized the project as relating to the development of new products.” (Br. 53.) UCC ignores the fact that resins produced in the

- 61 -

UCAT-J runs already were in commercial production (Op. 1265), so there was nothing new about them. Indeed, UCC sold resins produced in the UCAT-J runs without telling customers, unless contractually obligated to do so. (Op. 1226-27; A1593-94 Tr. 1610-11.) Confronted with the prospect that the UCAT-J project was not qualified research, but rather research after commercial production, *see* I.R.C.

§ 41(d)(4)(A), UCC maintained that the UCAT-J project was process research. (Op. 1262.) It never advanced the dubious argument that the UCAT-J project was both process and product research. Nonetheless, UCC tries to have it both ways by characterizing the UCAT-J project as process research, but claiming the cost of supplies for production as qualified research expenses. This is the type of cramming of expenses into the research credit calculation that the business component concept, and more specifically the distinction between process and product, was designed to avoid.¹⁴ *See supra* 39-40.

¹⁴ UCC did not argue that its research activities related to both a plant process and the product being produced. The need to distinguish between process and product under I.R.C. § 41(d)(2)(C) does not preclude a taxpayer from demonstrating that it performed qualified research in both respects. UCC points to academic works that appears
(continued...)

- 62 -

UCC also erroneously argues that the Tax Court “effectively eliminat[ed] the credit” when it comes to plant-based process research. (Br. 58; *see also* Am. Br. 20-24.) A taxpayer is entitled to claim as qualified research expenses the direct cost of such research, which is the incremental cost incurred above the normal cost of plant operations. Here, as stated by the Tax Court, that could have included “the cost of supplies that UCC used specifically to perform experiments during production or analyze data,” as well as the additional cost of raw materials above what it normally cost to produce the same amount of goods for sale.¹⁵ (Op. 1274.) But UCC did not establish that it incurred

¹⁴(...continued)

to suggest that such systemic research may not be uncommon. (Br. 53-54.) The validity of that position would depend on fact-intensive inquiries into particular research projects, as courts routinely make in research credit cases. *See United Stationers*, 163 F.3d at 445 (“§ 41 cases will always be highly fact-intensive”). The possibility of systemic research adds no weight to UCC’s contention that distinguishing between process and product research at the plant level is somehow unworkable.

¹⁵ The amici’s version of the argument that the Tax Court effectively denied the credit for process research rests on the erroneous premise that “[t]he Tax Court’s holding makes no allowance in the scope of the QREs for these variables.” (Am. Br. 22.) The amici also argue that the credit would be easier to administer if taxpayers were allowed to claim
(continued...)

- 63 -

any such costs. (*Id.*) UCC did establish that it paid wages to employees for engaging in qualified research, and those wages contributed to its research credit. (Op. 1274-75.) The exclusion of normal production costs from UCC's qualified research expenses does not reflect a bias against process research, but rather reflects that those costs were not incurred to conduct the qualified research.

Absent its claim of discrimination, UCC offers no reason why there would be less process research as a result of Tax Court's opinion (Br. 55-59), and none exists. The research credit encourages both product and process research by allowing taxpayers to include the full, direct cost of both in the credit calculation. UCC's complaint is that it cannot also include its production costs, but that would not spur additional qualified research, and it could create a perverse incentive to conduct redundant or inefficient activities. For example, allowing normal production costs to qualify might have given UCC an incentive

¹⁵(...continued)

production supply costs when conducting plant-based process research. (*Id.* at 21.) Assuming, *arguendo*, that this is true, such a blanket rule is wholly inconsistent with both the purpose and the mechanics of the credit.

- 64 -

to test other anti-coking technologies that it believed were less advanced than Amoco's technology. (Op. 1216.) Even if UCC expected such tests to fail, the testing costs might have been far less than the credit it could claim based on the costs of operating the plant during the tests.

3. The claimed supply costs were unreasonable

In addition to the applicable requirements of I.R.C. § 41(b), qualified research expenses must meet the requirements of "research and experimental expenditures" under I.R.C. § 174. One of the four tests of qualified research under I.R.C. § 41 is that "the research expenditures may be treated as expenses under section 174." I.R.C. § 41(d)(1)(A). Expenses eligible for the research credit therefore must "satisfy all the elements for a deduction under section 174." *Norwest Corp.*, 110 T.C. at 491. This includes the requirement that the amount be "reasonable under the circumstances." I.R.C. § 174(e). The operative question is whether "the amount of an expenditure for research or experimental activities . . . would ordinarily be paid for like activities by like enterprises under like circumstances." Treas. Reg. § 1.174-2(a)(6). The answer to that question in this case is clearly no.

- 65 -

UCC claimed as qualified research expenses supply costs of approximately \$6.67 million regarding the UCAT-J project, and approximately \$3.19 million regarding the Amoco anti-coking project. These amounts were the total cost of production, not the cost of the research activities. With respect to the latter, they were patently unreasonable. UCC itself suggests as much in that it did not treat its production costs as research expenses for accounting purposes or for R&D budget purposes, or apparently for any purpose save for the research credit. (Op. 1235; A209 ¶ 1085; A245 ¶ 2854.) Internally, UCC estimated its cost of carrying out the Amoco anti-coking project at \$222,000. (A287, A290-91.) Also, it did not follow any formal procedures to approve the funding of either project, which would have been inexplicable had their total cost actually been almost \$10 million. (A1074.) And, indeed, it was not. Industry competitors calculated the cost of plant research based on its incremental cost over and above the normal cost of production. (*Id.*) No one, including UCC, would have paid the amount of UCC's claimed supply costs for the "research or experimental activities."

- 66 -

4. The claimed supply costs were, in part, non-extraordinary utility costs excluded from the definition of “qualified research expenses” under Treas. Reg. § 1.41-2(b)(2)

As discussed, *supra* 35-36, there is no dispute that UCC claims as qualified research expenses utility costs incurred in the course of “normal” olefins production during the Amoco anti-coking project. Under Treas. Reg. § 1.41-2(b)(2), non-extraordinary utility costs are not eligible for the research credit. Simple logic dictates that the regulation prohibits UCC from claiming the utility costs at issue here.

C. The Tax Court’s finding that the sodium borohydride project failed to satisfy the “process of experimentation” test of qualified research is supported by the record

The “process of experimentation” test under I.R.C. § 41(d)(1)(C) requires that qualified research follow the scientific method. A process of experimentation is “a process designed to evaluate one or more alternatives to achieving 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.” Treas. Reg. § 1.41-4(a)(5); H.R. Conf. Rep. 99-841 (vol. 2) at II-72, 1986 U.S.C.C.A.N. at 4160. The research must “fundamentally rely” on

- 67 -

principles of science, and involve “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.” Treas. Reg. § 1.41-4(a)(5). Simply put, a taxpayer “must formulate and test hypotheses in order to dissipate uncertainty about the possibility of success.” *Eustace v. Commissioner*, 312 F.3d 905, 907 (7th Cir. 2002); *see also Norwest*, 110 T.C. at 496. Validation testing and basic forms of trial and error do not measure up because they are not evaluative, and leave a taxpayer in no better position to compare alternatives.

The Tax Court found that the sodium borohydride project failed the process of experimentation test because it did nothing more than confirm that sodium borohydride reduced acetaldehyde in the caustic scrubber to specification levels. (Op. 1262.) UCC took none of the steps that would have been helpful in evaluating the use of sodium borohydride in comparison with another alternative. As noted by the Tax Court (Op. 1262), it did not analyze any data (A1409 Tr. 886-87; A1483 Tr. 1177-79), or experiment with injection rates (A1485 Tr. 1185-

- 68 -

87). Dr. Manyik specifically recommended in his pretest report that the test include “[a]nalyse[s] for residual hydride . . . to determine efficiency and optimize the process,” and “monitor[ing] [of] acetaldehyde across the caustic column to be able to quantify the reaction kinetics.” (A402.) UCC did not follow through in either respect. (A349; A1483-84 Tr. 1178-83.) According to Dr. Manyik, “it sure would have been a waste of time to have run a test and not generate some kinetics.” (A1426 Tr. 953.) All told, the record shows that UCC did not evaluate the use of sodium borohydride through a process of experimentation.

UCC’s argument to the contrary lacks merit. It does not dispute that it did not analyze any data beyond determining that an unspecified amount of sodium borohydride reduces acetaldehyde with undetermined ancillary effects. There accordingly is no substance to its assertion that the sodium borohydride project was capable of evaluating alternatives (Br. 64). UCC also asserts that the sodium borohydride project eliminated uncertainty regarding the capability of sodium borohydride to remove acetaldehyde. (Br. 62.) But UCC already knew that. (Op. 1220; A397.) What it did not know was whether it should use sodium borohydride to remove acetaldehyde

- 69 -

“given its high cost and unknown efficiency.” (Op. 1261-62; A1398 Tr. 842.) UCC did not answer that question with any scientific rigor, and therefore could not evaluate its efficiency *vis-a-vis* other alternatives. Finally, UCC contends that validation testing alone demonstrates a process of experimentation. (Br. 64-65.) It is mistaken. *See Eustace*, 312 F.3d at 907 (“Experimentation is a subset of all steps taken to resolve uncertainty; otherwise searching for a place to park a car would be a ‘process of experimentation.’”); *see also Norwest*, 110 T.C. at 496 (“Unlike the regulations under 174 . . . a more structured method of discovery is required with respect to section 41.”).

- 70 -

CONCLUSION

For the foregoing reasons, the decision of the Tax Court is correct and should be affirmed.¹⁶

Respectfully submitted,

TAMARA W. ASHFORD

Deputy Assistant Attorney General

/s/ Andrew M. Weiner

GILBERT S. ROTHENBERG (202) 514-3361

JONATHAN S. COHEN (202) 514-2970

ANDREW M. WEINER (202) 305-2701

Attorneys

Tax Division

Department of Justice

Post Office Box 502

Washington, D.C. 20044

JANUARY 2012

¹⁶ As noted, *supra* 36 n.9, in the event this Court reverses the Tax Court, this case should be remanded to that court to consider, in the first instance, the Commissioner's alternative arguments that UCC's claimed supply costs were ineligible for the credit because they were, in part, non-extraordinary utility costs, and because they were unreasonable.

- 71 -

STATUTORY ADDENDUM

Internal Revenue Code of 1986 (26 U.S.C.):

§ 41. Credit for increasing research activities.

(a) General rule. For purposes of section 38 [IRC Sec. 38], the research credit determined under this section for the taxable year shall be an amount equal to the sum of--

(1) 20 percent of the excess (if any) of--

(A) the qualified research expenses for the taxable year, over

(B) the base amount,

(2) 20 percent of the basic research payments determined under subsection (e)(1)(A), and

(3) 20 percent of the amounts paid or incurred by the taxpayer in carrying on any trade or business of the taxpayer during the taxable year (including as contributions) to an energy research consortium for energy research.

(b) Qualified research expenses. For purposes of this section--

(1) Qualified research expenses. The term "qualified research expenses" means the sum of the following amounts which are paid or incurred by the taxpayer during the taxable year in carrying on any trade or business of the taxpayer--

(A) in-house research expenses, and

(B) contract research expenses.

(2) In-house research expenses.

- 72 -

(A) In general. The term "in- house research expenses" means--

(i) any wages paid or incurred to an employee for qualified services performed by such employee,

(ii) any amount paid or incurred for supplies used in the conduct of qualified research, and

(iii) under regulations prescribed by the Secretary, any amount paid or incurred to another person for the right to use computers in the conduct of qualified research.

Clause (iii) shall not apply to any amount to the extent that the taxpayer (or any person with whom the taxpayer must aggregate expenditures under subsection (f)(1)) receives or accrues any amount from any other person for the right to use substantially identical personal property.

(B) Qualified services. The term "qualified services" means services consisting of--

(i) engaging in qualified research, or

(ii) engaging in the direct supervision or direct support of research activities which constitute qualified research.

If substantially all of the services performed by an individual for the taxpayer during the taxable year consists of services meeting the requirements of clause (i) or (ii), the term "qualified services" means all of the services performed by such individual for the taxpayer during the taxable year.

- 73 -

(C) Supplies. The term "supplies" means any tangible property other than—

(i) land or improvements to land, and

(ii) property of a character subject to the allowance for depreciation.

(D) Wages.

(i) In general. The term "wages" has the meaning given such term by section 3401(a).

(ii) Self-employed individuals and owner-employees. In the case of an employee (within the meaning of section 401(c)(1), the term "wages" includes the earned income (as defined in section 401(c)(2)) of such employee.

(iii) Exclusion for wages to which work opportunity credit applies. The term "wages" shall not include any amount taken into account in determining the work opportunity credit under section 51(a).

* * * * *

(d) Qualified research defined. For purposes of this section--

(1) In general. The term "qualified research" means research--

(A) with respect to which expenditures may be treated as expenses under section 174,

(B) which is undertaken for the purpose of discovering information--

- 74 -

(i) which is technological in nature, and

(ii) the application of which is intended to be useful in the development of a new or improved business component of the taxpayer, and

(C) substantially all of the activities of which constitute elements of a process of experimentation for a purpose described in paragraph (3).

Such term does not include any activity described in paragraph (4).

(2) Tests to be applied separately to each business component. For purposes of this subsection--

(A) In general. Paragraph (1) shall be applied separately with respect to each business component of the taxpayer.

(B) Business component defined. The term "business component" means any product, process, computer software, technique, formula, or invention which is to be--

(i) held for sale, lease, or license, or

(ii) used by the taxpayer in a trade or business of the taxpayer.

(C) Special rule for production processes. Any plant process, machinery, or technique for commercial production of a business component shall be treated as a separate business component (and not as part of the business component being produced).

(3) Purposes for which research may qualify for credit. For purposes of paragraph (1)(C)--

- 75 -

(A) In general. Research shall be treated as conducted for a purpose described in this paragraph if it relates to--

- (i) a new or improved function,
- (ii) performance, or
- (iii) reliability or quality.

(B) Certain purposes not qualified. Research shall in no event be treated as conducted for a purpose described in this paragraph if it relates to style, taste, cosmetic, or seasonal design factors.

(4) Activities for which credit not allowed. The term "qualified research" shall not include any of the following:

(A) Research after commercial production. Any research conducted after the beginning of commercial production of the business component.

(B) Adaptation of existing business components. Any research related to the adaptation of an existing business component to a particular customer's requirement or need.

(C) Duplication of existing business component. Any research related to the reproduction of an existing business component (in whole or in part) from a physical examination of the business component itself or from plans, blueprints, detailed specifications, or publicly available information with respect to such business component.

(D) Surveys, studies, etc. Any--

- (i) efficiency survey,

- 76 -

(ii) activity relating to management function or technique,

(iii) market research, testing, or development (including advertising or promotions),

(iv) routine data collection, or

(v) routine or ordinary testing or inspection for quality control.

* * * * *

§ 174. Research and experimental expenditures.

(a) Treatment as expenses.

(1) In general. A taxpayer may treat research or experimental expenditures which are paid or incurred by him during the taxable year in connection with his trade or business as expenses which are not chargeable to capital account. The expenditures so treated shall be allowed as a deduction.

* * * * *

(e) Only reasonable research expenditures eligible. This section shall apply to a research or experimental expenditure only to the extent that the amount thereof is reasonable under the circumstances.

* * * * *

Treasury Regulations (26 C.F.R.):

§ 1.41-2 Qualified Research Expenses.

* * * * *

- 77 -

(b) Supplies and personal property used in the conduct of qualified research –

(1) In general. Supplies and personal property (except to the extent provided in paragraph (b)(4) of this section) are used in the conduct of qualified research if they are used in the performance of qualified services (as defined in section 41(b)(2)(B) [26 USCS § 41(b)(2)(B)], but without regard to the last sentence thereof) by an employee of the taxpayer (or by a person acting in a capacity similar to that of an employee of the taxpayer; see example (6) of § 1.41-2(e)(5)). Expenditures for supplies or for the use of personal property that are indirect research expenditures or general and administrative expenses do not qualify as inhouse research expenses.

(2) Certain utility charges --

(i) In general. In general, amounts paid or incurred for utilities such as water, electricity, and natural gas used in the building in which qualified research is performed are treated as expenditures for general and administrative expenses.

(ii) Extraordinary expenditures. To the extent the taxpayer can establish that the special character of the qualified research required additional extraordinary expenditures for utilities, the additional expenditures shall be treated as amounts paid or incurred for supplies used in the conduct of qualified research. For example, amounts paid for electricity used for general laboratory lighting are treated as general and administrative expenses, but amounts paid for electricity used in operating high energy equipment for qualified research (such as laser or nuclear research) may be treated as expenditures for supplies used in the conduct of qualified research to the extent the taxpayer can establish that the special character of the

- 78 -

research required an extraordinary additional expenditure for electricity.

* * * * *

(c) Qualified services --(1) Engaging in qualified research. The term "engaging in qualified research" as used in section 41(b)(2)(B) means the actual conduct of qualified research (as in the case of a scientist conducting laboratory experiments).

* * * * *

§ 1.41-4 Qualified research for expenditures paid or incurred in taxable years ending on or after December 31, 2003.

(a) Qualified research --

* * * * *

(5) Process of experimentation --

(i) In general. For purposes of section 41(d) and this section, 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. 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). A process of experimentation must be an evaluative process and

- 79 -

generally should be capable of evaluating more than one alternative. A taxpayer may undertake a process of experimentation if there is no uncertainty concerning the taxpayer's capability or method of achieving the desired result so long as the appropriate design of the desired result is uncertain as of the beginning of the taxpayer's research activities. Uncertainty concerning the development or improvement of the business component (e.g., its appropriate design) does not establish that all activities undertaken to achieve that new or improved business component constitute a process of experimentation.

- 80 -

Certificate of Compliance With Type-Volume Limitation,
Typeface Requirements, and Type Style Requirements

1. This brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B) because:

this brief contains 13,806 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii), or

this brief uses a monospaced typeface and contains [*state the number of*] lines of text, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii).

2. This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because:

this brief has been prepared in a proportionally spaced typeface using WordPerfect Version X3 in Century Schoolbook 14 point type, *or*

this brief has been prepared in a monospaced typeface using [*state name and version of word processing program*] with [*state number of characters per inch and name of type style*].

/s/ Andrew M. Weiner
ANDREW M. WEINER
Attorney for the Commissioner

Dated: January 4, 2012

- 81 -

CERTIFICATE OF SERVICE

It is hereby certified that appellee's response brief was filed on this 4th day of January 2012, by uploading a copy to the Court's CM/ECF system, and by mailing six (6) copies to the Clerk via first-class mail. It is further certified that service of the brief was made on counsel for appellant by CM/ECF.

/s/ Andrew M. Weiner
ANDREW M. WEINER
Attorney