



The Construction Lawyer

Journal of the ABA Forum on the Construction Industry Volume 31, Number 4, Fall 2011

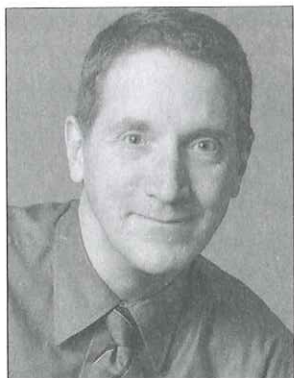


Uncovering Insurance

Illustration: Garrett Kallenbach

Cases and Board Decisions on Cumulative Impact Claims

William Ibbs and Long D. Nguyen



William Ibbs



Long D. Nguyen

Change can be disruptive to construction. Multiple change orders may cause a cumulative impact or ripple effect, and harm labor productivity on change order and base contract work. Cumulative impact was defined in *Centex Bateson Construction Co.*¹ as “the unforeseeable disruption of productivity resulting from the ‘synergistic’ effect of an undifferentiated group of changes.” The US courts and boards of contract appeals have acknowledged cumulative impact claims for a few decades, yet there is still a need for guidance on how to successfully prosecute and defend such claims.

This article presents such guidance using a review of 24 cases and board decisions, including 12 successful and 12 unsuccessful claims. Each case is presented with a description of the type of work involved, the nature and extent of change, and a description of the ruling. By examining these cases, this article identifies a basis for successful cumulative impact claims due to multiple changes.

Cases With Cumulative Impact Claims

Courts and boards of contract appeals have recognized cumulative impact claims since the late 1960s. In *Bell BCI Co. v. United States*,² the US Court of Federal Claims stated:

Until 1967, the Rice doctrine³ precluded courts from considering the effect of change orders on portions of the work not directly covered by the change. . . . To avoid inequitable results, the Government changed the standard Changes clause in late 1967 to add language that covers the effect of changes on unchanged work.

William Ibbs is professor of Construction Management, Department of Civil and Environmental Engineering, University of California, Berkeley, and president, The Ibbs Consulting Group, Inc. Long D. Nguyen is assistant professor, Department of Environmental and Civil Engineering, Florida Gulf Coast University, Fort Myers.

Specifically, cumulative impact costs may be awarded if the three components of liability, causation, and resultant injury are proven with sufficient certainty. A review of cases is necessary to identify reasons why cumulative impact claims are successful or unsuccessful in legal proceedings.

Tables 1 and 2 present representative cases in which courts or boards awarded and denied cumulative impact claims, respectively. The cases are listed chronologically. Each table summarizes cases according to three key attributes: type of work, extent of change, and brief explanation of the ruling by courts and boards.

Cases Allowing Cumulative Impact Claims

Courts and boards typically awarded cumulative impact claims if there was sufficient demonstration that an excessive number of changes occurred and caused a ripple impact on efficiency (Table 1). Although “measured mile” analysis is popular (and will be addressed in a future piece by these writers), other methods have been used successfully in cumulative impact cases.

In *C. Norman Peterson Co. v. Container Corp.*,⁴ the quantum meruit theory was used to calculate the reasonable value of the work performed by the contractor because of numerous change orders and contract abandonment. Quantum meruit is “the measure of damages for recovery on a contract that is said to be ‘implied in fact.’”⁵ In *Clark Construction Group, Inc.*,⁶ the Board awarded cumulative impact costs to the contractor and its subcontractors by utilizing the Mechanical Contractors Association of America (MCAA) Manual to estimate productivity losses. A benchmarking methodology developed by one of the authors of this article, comparing a disputed project to hundreds of other projects, also has been used in some unpublished cases and arbitrations.⁷

Preferred methods with project-specific cost or productivity data (or both) were utilized successfully in many of the above cases (Table 1). In *Bell BCI Co. v. United States*,⁸ a combination of measured mile and “earned value” (i.e., earned hours vs. unearned hours) analyses showed 80,317 hours of the 320,703 total hours lost due to the cumulative impact of change orders. This approach satisfied the trial court (but note that the Federal Circuit subsequently reversed):

Through 1999, Bell had completed a significant portion of the base Contract work . . . and incurred a non-productive work rate of eight percent on the project. . . . Mr. Brannon [government expert] attributed one-half of the non-productive hours to Bell for this period, and set Bell’s reasonable productivity level at 104 percent of

the originally planned productivity. . . . Mr. Brannon compared actual hours incurred on the project against 104 percent of the originally planned hours to calculate unearned hours attributable to the NIH changes. Mr. Brannon found that approximately 25 percent of Bell's total hours expended on the project were attributable to labor productivity loss caused by the NIH changes.⁹

Another combination of factors was at issue in *James Corp. d/b/a James Construction v. North Allegheny School District, et al.*¹⁰ In that case, the parties and court dealt with a measured-mile analysis:

Dividing the Project into two time periods, claim expert compared the percentage of work completed in each period to the number of labor hours utilized. During the first period, Contractor expended 4,279 hours to complete 41.76% of the Project. Had Contractor been able to work at the same pace during the second period, it would have expended an additional 5,967 hours to complete the remainder of the Project. However, the Project's total hours equaled 19,645 hours; therefore, Contractor used 15,366 hours to complete the second period (19,645 - 5,967). Thus, the inefficient labor hours amounted to 9,366 (15,366 - 5,967 = 9,366). To arrive at an earned value factor of 61%, claim expert divided the inefficient labor hours by the number of hours worked in the second period (9,366 ÷ 15,366 = 61%). . . . In sum, because the existence of damages was established, because the measured mile analysis offers a reasonable basis upon which damages can be calculated, and because the trial court found this approach persuasive, we discern no merit in School District's assertions.¹¹

Because the project was disrupted from the outset, the court allowed use of a measured-mile analysis that was based on earned value per percent complete rather than the more traditional labor-hours per unit of work. This means that an impacted portion of the project was compared to a less-impacted portion using work that was roughly similar, rather than a very similar basis. In this case the work was excavation and foundation work.

In *Clark Concrete Contractors, Inc.*,¹² the board upheld the contractor's measured mile of the same activities of concrete work. The measured mile established the production rates in an unimpacted period and an impacted period for four activities: forming of the floor slabs, stripping of slab formwork, combined forming and stripping of columns, and combined forming and stripping of stairs:

To determine the labor inefficiency costs resulting from the blast changes in the forming of the concrete floor slabs, OMNI identifies as an unimpacted period the time from the beginning of formwork until August 28, 1995, the date on which the contractor received the first of the massive blast design changes. The time from Au-

gust 28, 1995, to March 10, 1996, when the forming of the third floor slab was completed atop the added blast wall, is a highly impacted period. The time from March 10 to July 7, 1996, when slab forming activities ended, is a lesser impacted period. . . . OMNI achieved the following productivity rates: during the unimpacted period, .048 man-hours per square foot; during the highly impacted period, .113 man-hours per square foot; and during the lesser impacted period, .065 man-hours per square foot.¹³

In *P.J. Dick, Inc.*,¹⁴ productivity of branch circuit work was allegedly lost due to design deficiencies. Because no unimpacted period was identifiable for branch circuit work, the claimant used installation of feeder circuit as similar work to support its measured-mile analysis. The measured-mile analysis using the branch-feeder circuit comparison resulted in a computation of 39,354 unproductive labor-hours out of a total of 70,498 actual branch circuit labor-hours because of owner-caused changes:

The success of a cumulative impact claim often turns on whether the claimant reserved or waived its rights to make such a claim.

[The contractor's expert] divided the actual man-hours worked on feeders by the adjusted budget for feeders to arrive at a "demonstrated efficiency" factor of 1.147. That is: To earn each man-hour in the budget for the feeders, Kent Electric had to work 1.147 hours. . . . Multiplying this budget by the demonstrated efficiency factor of 1.147, results in an adjusted branch budget of 31,143.8 man-hours. Deducting this adjusted budget from the actual branch hours of 70,498, results in 39,354.2 unproductive man-hours. At the stipulated hourly wage rate, the unproductive man-hours results in additional labor costs of \$1,471,453 attributable to VA [owner] caused inefficiency.¹⁵

The success of a cumulative impact claim often turns on whether the claimant reserved or waived its rights to make such a claim. Courts and boards frequently examine broad waiver and release language to determine whether the parties specifically addressed cumulative impact costs in the change order negotiation process.¹⁶ *Appeal of P.J. Dick, Inc.*¹⁷ is one such case, in which the court held that the contractor reserved its right to seek additional impact and suspension costs when accepting time extensions.

Cases Denying Cumulative Impact Claims

Table 2 contains cases in which cumulative impact claims were denied due to any of the three typical reasons: release or waiver (or both) language in either the contract or contract modifications (cases 1, 2, 4, and 12); changes not resulting in a sufficiently fundamental change to the contract (cases 3, 5, and 8); and no or insufficient proof of causal connection between lost productivity and changes directly or constructively ordered by the other party, generally the project owner (cases 6, 7, 8, 9, 10, and 11).

In *Central Mechanical Construction*,¹⁸ the Board rejected a cumulative impact claim because the contractor signed change orders with release language aimed at covering all direct and indirect costs and therefore barred any subsequent claim. In *Bell BCI Co.*,¹⁹ the US Court of Appeals for the Federal Circuit held that certain language in some of the contract modifications was unambiguous, and that the contractor released certain cumulative impact claims in connection with the modification:

We do not question the court's finding that, in light of the numerous changes to the contract, Bell suffered a cumulative impact. But the issue is not whether Bell suffered a cumulative impact—it is whether Bell released the government from liability for that impact.²⁰

In *Pittman Construction Co.*,²¹ a cumulative impact claim was denied because the Board held that the total amount of change (12 percent increase in contract value) and its character did not fundamentally alter the contract.

The US Court of Federal Claims refused a contractor's claim for lost productivity damages in *Triax Co. v. United States*,²² reasoning that the claimant failed to prove the causal connection between numerous change orders and lost productivity. The total cost method was used for calculating cumulative impact costs in this case, and that seems to have contributed to the judgment.

Successful Cumulative Impact Claims

Courts and boards have acknowledged cumulative impacts of multiple change orders for nearly a half century. However, historical cases show that cumulative impact claims can be awarded or not awarded contingent on a few typical conditions. Based on the cases reviewed in this article, a successful cumulative impact claim must show to a reasonable degree of certainty the following:


1. A project has suffered such an extensive amount of change that the contract has been fundamentally altered. A large number of change orders alone may not constitute a fundamental alteration.
2. The contractor has not waived its claim. What may appear to be a waiver may be ineffective if the claim was not reasonably foreseeable at the time the change order was signed.
3. The contractor can demonstrate a causal link between changes and contractor inefficiency; and
4. The contractor can substantiate a reasonable estimate of resulting damages with project records, industry studies, or both. 

Table 1. Cases in Which Cumulative Impact Claims Were Successful

Case	Type of Work	Extent of Change	Ruling
Litton Systems, Inc., Ingalls Shipbuilding Division ²³	Building nuclear submarines	58 percent increase in contract value and four-year delay resulting from several thousand change orders.	A fundamental change in the contract caused by multiple change orders.
Coley Properties Corp. v. United States ²⁴	Building a postal facility	Large number of changes. Unchanged work was performed out of sequence due to numerous change orders.	The plaintiff was entitled to recover \$938,224 for "increased performance costs due to the impact of the changes ordered by respondent" attributable to the postal service.

Table 1. Cases in Which Cumulative Impact Claims Were Successful (Continued)

Case	Type of Work	Extent of Change	Ruling
C. Norman Peterson Co. v. Container Corp. ²⁵	Papermill modernization	Multiple design errors and changes. Hundreds of change orders but not in writing, many of them significant.	(1) The owner had abandoned the contract; (2) the owner had breached the contract; (3) as a proximate result of the owner's breach and abandonment of the contract, the guaranteed maximum provisions of the contract were not applicable and the contractor was therefore entitled to recover the reasonable costs of its work. Judgment was awarded to the plaintiff for \$2,898,687.47, together with interest at the rate of 7 percent on the sum of \$2,836,720.81, from the date of the Complaint, November 28, 1978, to and including December 31, 1982, and at the rate of 10 percent on any unsatisfied sum from January 1, 1983, to and including the date of satisfaction of judgment.
State <i>ex rel.</i> Department of Transportation v. Guy F. Atkinson Co. ²⁶	Highway construction	Numerous changes were ordered by state engineers over the course of the project.	Ongoing piecemeal changes impacted the entire operation. Jury verdict method was adopted because sufficient proof of damages was impossible. Judgment affirmed by arbitrator who awarded the contractor 65 percent of its claimed damages, or \$1,130,618.
David J. Tiernay ²⁷	Building construction	44 change orders issued.	Some changes had a cumulative impact on job progress as a whole, for which the contractor was entitled to compensation. Jury verdict method was adopted due to insufficient proof of damages.

Table 1. Cases in Which Cumulative Impact Claims Were Successful (Continued)

Case	Type of Work	Extent of Change	Ruling
Charles G. Williams Construction, Inc. ²⁸	General contracting	26 change orders issued due to defective drawings and specifications.	Compensation for cumulative impact costs. Markup (15 percent) in each change order did not adequately compensate the contractor for cumulative disruption of the performance and administration of the contract.
Atlas Construction Co., Inc. ²⁹	General contracting	Various change orders and design variances/clarifications were issued.	Recognized cumulative impacts. Productivity loss as a result of multiple change orders. Additional costs for updating CPM schedules and field office overhead were also awarded. Late, tenant-directed changes influenced court in contractor's favor.
Clark Concrete Contractors, Inc. ³⁰	General contracting for a thirteen-level (four below ground and nine above) cast-in-place concrete office building	Blast redesign was ongoing during the course of construction.	Damages for increased labor costs due to lost productivity, additional work, and overtime premium. Contractor was entitled to an equitable adjustment of \$6,207,605. Board held that Clark was responsible for 71 days of delay and that the GSA was responsible for the remaining 185 days.

Table 1. Cases in Which Cumulative Impact Claims Were Successful (Continued)

Case	Type of Work	Extent of Change	Ruling
The Clark Construction Group, Inc. ³¹	Plumbing and mechanical subcontracting for construction of a medical center	Construction sequence changed from horizontal to vertical; late response to RFIs; design conflicts	Undeniable productivity losses caused by change in construction sequence and wet conditions. Liability and causation were not especially detailed, but government's changes were so extensive and pervasive that any such type of analysis would not likely have been possible. Board employed inefficiency factors published by Mechanical Contractors Association of America (MCAA) to determine lost labor productivity. Board found that "the percentage estimates of loss of efficiency to be an appropriate method to quantify such losses." Board also found that the change in construction sequence impacted the contractor's productivity by 7.5 percent. Contractor awarded \$853,355 plus interest.
P.J. Dick, Inc. ³²	Electrical general contracting for the clinical addition to a medical center	Over 400 orders changing the contract were issued, resulting in over 5 percent increase in contract value, 107 days of additional contract performance time. Contractor completed the work 260 days after original contract completion date and 153 days after revised date.	In accepting the additional days to complete the contract, the contractor reserved its right to seek additional impact and suspension costs. Electrical design deficiencies and constructive acceleration reduced electrical (branch circuit) labor productivity. Measured mile of similar work (feeder circuit) was allowed. Large number of late changes.

Table 1. Cases in Which Cumulative Impact Claims Were Successful (Continued)

Case	Type of Work	Extent of Change	Ruling
Amelco Electric v. City of Thousand Oaks ³³	Electrical work on a multiprime project for the construction of civic arts plaza	Owner issued 248 sketches affecting electrical costs; 221 change orders requested. Both parties agreed upon 32 change orders encompassing these change order requests and amounting to \$1,009,728 above the contract price, an increase of nearly 17 percent.	Sheer number of changes did not result in abandonment of a public works contract. Calling the total cost method "disfavored," court adopted four-part federal test. Contractor must demonstrate that (1) it was impractical to prove its actual losses directly, (2) its bid was reasonable, (3) its actual costs were reasonable, and (4) it was not responsible for the added costs. Court concluded that Amelco did not meet its burden of establishing the fourth element because it did not establish how any particular breach caused certain damages, who (owner, contractor, or CM) might have caused any such breach, and when any particular breach occurred.
Bell BCI Co. v. United States ³⁴ Note: The Federal Circuit subsequently affirmed in part and vacated in part.	General contracting for a laboratory building	34 percent increase in contract value due to 206 contract modifications; 730 extra work orders; 70 percent increase in duration.	Reasonable basis for a cumulative impact claim. Court held that release language was ambiguous and contractor did not expressly release its cumulative impact claim in any modification.

Table 2. Cases in Which Cumulative Impact Claims Were Denied

Case	Type of Work	Extent of Change	Ruling
Watt Plumbing, Air Conditioning & Electric, Inc. v. Tulsa Rig, Reel and Manufacturing Co. ³⁵	Electrical	Contractor alleged breach of contract by excessive change.	Not breach of contract because modification of contract becomes part of contract and the contract as altered was agreed by the parties.
Dyson & Co. ³⁶	Mechanical	39 change orders resulting in 19 percent increase in contract value.	Contract language not allowing for claims not included in the previous change orders.
Pittman Construction Co. v. United States ³⁷	Electrical and plumbing; general contracting	12 percent increase in contract value due to 206 change orders; 10 percent increase in duration—102 days on 1,000-day original contract duration.	Not a fundamental change in the contract. Many changes foreseeable.
Central Mechanical Construction ³⁸	Mechanical	Release language included in multiple change orders.	Contractor failed to reserve the rights to recover cumulative impact costs. Waiver and releases barred any subsequent claim.
Freeman-Darling, Inc. ³⁹	General contracting	Numerous change orders.	Not a fundamental change in the contract for a cumulative impact. Multiple changes alone did not constitute a compensable cumulative impact claim because many were small dollar-value (less than \$5,000).
Triax Co. v. United States ⁴⁰	Information not available from decision	Numerous change orders.	The court agreed that the changes impacted labor productivity. No proof of causal linkage between numerous changes and cost overruns.
Gulf Coast Trailing Co. ⁴¹	Not available	Differing site condition and reduced production rate.	No proof of causation shown.

Table 2. Cases in Which Cumulative Impact Claims Were Denied (Continued)

Case	Type of Work	Extent of Change	Ruling
Southwest Marine, Inc. ⁴²	Dry-docking, repairing, and modifying a ship	202 change orders incorporated in 95 contract modifications were issued during the course of work.	Not a fundamental change in the contract and insufficient causal connection. Contractor had to stop, wait for materials, and then restart once the parts were available, but the daily record showed manpower levels were accordingly reduced and there was no persuasive evidence showing that reduced manpower was inefficient.
Dawson Construction Co. ⁴³	General contracting for a medical center	Numerous change orders.	The contractor did not meet its burden of proof with regard to causation of injury in its disruptions claim.
Centex Bateson Construction Co., Inc. ⁴⁴	Electrical; general contracting	1,561 events reflected in over 700 requests for information (RFIs) in electrical work; 5.6 percent increase in contract value due to numerous change orders.	The Board agreed that cumulative impacts may be recovered but held that the existence of multiple change orders was not sufficient. Late responses to RFIs were shown but contractor failed to tie that to impact (causation).
Coates Industrial Piping, Inc. ⁴⁵	Mechanical	Permit delay and design deficiencies; 157 change order requests (CORs)	No proof of causal linkage between changes and loss of labor efficiency. Court emphasized contractor had some foreseeability of changes and productivity impacts.

Table 2. Cases in Which Cumulative Impact Claims Were Denied (Continued)

Case	Type of Work	Extent of Change	Ruling
Bell BCI Co. v. United States ⁴⁶	General contracting for a laboratory building	34 percent increase in contract value due to 206 contract modifications; 730 extra work orders; 70 percent increase in duration.	Contract modification language releasing the government (owner) from "any and all liability" attributable to the project change. General contractor used earned-value measured-mile approach, while subcontractor used units-of-work approach. Note: The U.S. Court of Federal Claims in <i>Bell BCI Co. v. United States</i> , 81 Fed. Cl. 617 (2008), had previously found that the release language was ambiguous.

Endnotes

1. V.A.B.C.A. No. 4613, 99-1 B.C.A. (CCH) ¶ 30,153, at 149,259 (1998).
2. 81 Fed. Cl. 617 (2008), *aff'd in part and vacated in part*, 570 F.3d 1337 (Fed. Cir. 2009).
3. See *Rice v. United States*, 317 U.S. 61, 64-65 (1942).
4. 172 Cal. App. 3d 628, 218 Cal. Rptr. 592 (1985).
5. H. H. McConnell, *Distinguishing Quantum Meruit and Unjust Enrichment in the Construction Setting*, 71:3 FLA. B.J. 88 (1997).
6. V.A.B.C.A. No. 5674, 00-1 B.C.A. (CCH) ¶ 30,870 (2000).
7. C. William Ibbs, *Quantitative Impacts of Project Change: Size Issues*, 123:3 J. CONSTR. ENG'G & MGMT. 308-31 (Sept. 1997); William Ibbs, *Quantitative Impacts of Project Change: Timing Issues*, 131:11 J. CONSTR. ENG'G & MGMT. 1219-23 (Nov. 2005).
8. 81 Fed. Cl. 617 (2008), *aff'd in part and vacated in part*, 570 F.3d 1337 (Fed. Cir. 2009).
9. *Id.* at 637-638.
10. 938 A.2d 474 (Pa. Commw. Ct. 2007).
11. *Id.* at 509.
12. *Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, G.S.B.C.A. No. 14340, 99-1 B.C.A. (CCH) ¶ 30,280 (1999).
13. *Id.* at 149,747.
14. V.A.B.C.A. Nos. 6080-82, 01-2 B.C.A. (CCH) ¶ 31,647 (2001).
15. *Id.* at 156,338.
16. L. E. Backus, *The Cumulative Impact Claim: Where Do We Stand in 2010*, 77:2 DEF. COUNS. J. 206-25 (2010).
17. *P.J. Dick*, 01-2 B.C.A. (CCH) ¶ 31,647.
18. A.S.B.C.A. No. 29434, 86-3 B.C.A. (CCH) ¶ 19,240 (1986).
19. *Bell BCI Co. v. United States*, 570 F.3d 1337 (Fed. Cir. 2009).
20. *Id.* at 1,341.
21. *Pittman Constr. Co. v. United States*, 2 Cl. Ct. 211 (1983).
22. 28 Fed. Cl. 733 (1993).

23. A.S.B.C.A. No. 17578, 78-1 B.C.A. (CCH) ¶ 13,038 (1978).
24. 593 F.2d 380 (Ct. Cl. 1979).
25. 172 Cal. App. 3d 628, 218 Cal. Rptr. 592 (1985).
26. 187 Cal. App. 3d 25, 231 Cal. Rptr. 382 (1986).
27. G.S.B.C.A. Nos. 7107, 6198, 88-2 B.C.A. (CCH) ¶ 20,806 (1988).
28. A.S.B.C.A. No. 33766, 89-2 B.C.A. (CCH) ¶ 21,733 (1989).
29. G.S.B.C.A. No. 8593, 90-2 B.C.A. (CCH) ¶ 22,812 (1990).
30. G.S.B.C.A. No. 14340, 99-1 B.C.A. (CCH) ¶ 30,280 (1999).
31. V.A.B.C.A. No. 5674, 00-1 B.C.A. (CCH) ¶ 30,870 (2000).
32. V.A.B.C.A. Nos. 6080-82, 01-2 B.C.A. (CCH) ¶ 31,647 (2001).
33. 27 Cal. 4th 228, 115 Cal. Rptr. 2d 900, 38 P.3d 1120 (2002), rehearing denied by 2002 Cal. LEXIS 1689 (Mar. 13, 2002).
34. 81 Fed. Cl. 617 (2008), *aff'd in part and vacated in part*, 570 F.3d 1337 (Fed. Cir. 2009).
35. 533 P.2d 980, 983 (Okla. 1975).
36. A.S.B.C.A. No. 21673, 78-2 B.C.A. (CCH) ¶ 13,482 (1978).
37. 2 Cl. Ct. 211 (1983).
38. A.S.B.C.A. No. 29434, 86-3 B.C.A. (CCH) ¶ 19,240 (1986).
39. G.S.B.C.A. No. 7112, 89-2 B.C.A. (CCH) ¶ 21,882 (1989).
40. 28 Fed. Cl. 733 (1993).
41. E.N.G.B.C.A. No. 5795, 94-2 B.C.A. (CCH) ¶ 26,921 (1994).
42. DOT B.C.A. No. 1663, 94-3 B.C.A. (CCH) ¶ 27,102 (1994).
43. V.A.B.C.A. Nos. 3306-10, 93-3 B.C.A. (CCH) ¶ 26,177 (1993), *aff'd*, 34 F.3d 1080 (Fed. Cir. 1994).
44. V.A.B.C.A. No. 4613, 99-1 B.C.A. (CCH) ¶ 30,153, at 149,259 (1998).
45. V.A.B.C.A. No. 5412, 99-2 B.C.A. (CCH) ¶ 30,479 (1999).
46. 570 F.3d 1337 (Fed. Cir. 2009).