AACE INTERNATIONAL RECOMMENDED PRACTICE

13OR-23

DEMONSTRATING ENTITLEMENT TO CUMULATIVE IMPACT CLAIMS IN CONSTRUCTION

AACE INTERNATIONAL

Rev. May 15, 2023

AACE® International Recommended Practice No. 130R-23

DEMONSTRATING ENTITLEMENT TO CUMULATIVE IMPACT CLAIMS IN CONSTRUCTION

TCM Framework: 6.4 – Forensic Performance Assessment

TCM. May 15, 2023

Note: As AACE International Recommended Practices evolve over time, please refer to web.aacei.org for the latest revisions.

Any terms found in AACE International Recommended Practice 10S-90, *Cost Engineering Terminology*, supersede terms defined in other AACE work products, including but not limited to, other recommended practices, the *Total Cost Management Framework*, and *Skills & Knowledge of Cost Engineering*.

Contributors:

Disclaimer: The content provided by the contributors to this recommended practice is their own and does not necessarily reflect that of their employers, unless otherwise stated.

Dr. Stephen P. Warhoe, PE CCP CFCC FAACE Hon. Life (Primary Contributor)
Richard J. Long, PE P.Eng. (Primary Contributor)
Christopher W. Carson, CEP DRMP PSP FAACE
John J. Ciccarelli, PE CCP PSP FAACE
Brian J. Furniss, PE CCP CFCC PSP
Greg Holness, PE
Dr. William Ibbs
Donald F. McDonald, Jr. CCP PSP FAACE Hon. Life
Mark F. Nagata, PSP
Mark C. Sanders, PE CCP CFCC PSP
William C. Schwartzkopf
Nurullah Sonmez, CCP
Dr. Amin Terouhid, DRMP PSP
Dr. Tong Zhao, PE CCP CFCC PSP

AACE® International Recommended Practice No. 130R-23

DEMONSTRATING ENTITLEMENT TO CUMULATIVE IMPACT CLAIMS IN CONSTRUCTION

TCM Framework: 6.4 – Forensic Performance Assessment

May 15, 2023

TABLE OF CONTENTS

May 15, 2023

1. INTRODUCTION

This recommended practice (RP) of AACE International provides guidance on the process to demonstrate entitlement to cumulative impact claims on a construction project when a process for addressing cumulative impact claims is not addressed in the contract terms. This process applies across all common construction contracting strategies or delivery methods if the contract terms do not address any or some aspects of the procedure to address cumulative impact claims.

This RP is intended to provide guidelines (*i.e.*, not be a mandated standard) for a suggested process to use when submitting a contract change order request (COR) or claim associated with cumulative impact and what to look for when defending or analyzing such claims on construction projects.[1] This recommended practice represents the concepts most practitioners consider a good industry practice to use and recommend. This recommended practice is relevant to stakeholders on a construction project, whether owner, designer, contractor, subcontractor, construction manager, or others. Although this recommended practice is written in the context of a contract between an owner and prime contractor, it is applicable to any party contracted to perform work on a project, including contracts between prime contractors and their subcontractors and their suppliers.

The concept of cumulative impact has been recognized within the construction industry internationally for many years. It has also been referred to as ripple effect or knock-on effect and as a global claim in English literature and case law. Cumulative impact is defined as the net impact of two or more undifferentiated changes, as each is measured or measurable at a certain point in time, being much greater than the sum of the effect of the individual parts. This effect results in the reduced productivity of unchanged work. Due to the complicated nature of construction work, it is not usually well understood by contracting parties and even legal professionals. Cumulative impact, when it occurs on a construction project, is often referred to as an indirect disruption or loss of productivity claim. There is no specific number or total value of changes on a project that, once reached, create the circumstance for a cumulative impact. The terms of most construction contracts allow for changes, but they do not typically define any maximum limit for changes. This lack of contractual limits can lead to disputes regarding whether the number or value of changes was reasonable or foreseeable.

This RP provides a basic understanding of cumulative impact and outlines the steps necessary to demonstrate or refute a contractor's entitlement to the potential damages that may result. Cumulative impact is defined as:[2]

- The unforeseeable disruption of productivity resulting from the *synergistic* effect of an undifferentiated group of changes. Cumulative impact is referred to as the *ripple effect* of changes on unchanged work that causes a decrease in productivity and is not analyzed in terms of spatial or temporal relationships;[3] and

- The impact on unchanged work, which is not attributable to any one change but flows from the synergy of the number and scope of changes issued on a project.[4]

In a cumulative impact claim, the aggrieved contractor seeks compensation for the collective damage caused by all of the changes in addition to particularizing the damages arising from each change. Cumulative impact claims are often erroneously called total cost claims. *Total cost* describes a method for quantifying cumulative impact claims not the actual condition per se.

[1] See AACE International Recommended Practice 100R-19, *Contract Change Management – As Applied in Engineering, Procurement, and Construction.*

[2] See AACE International Recommended Practice 10S-90. *Cost Engineering Terminology*.

[3] Centex Bateson Constr. Co., VABCA Nos. 4613, 5162, 5165, 99-1 BCA ¶ 30,153 (1998), aff'd, Centex Bateson Constr. Co. v. West, 250 F.3rd 761 (Fed Cir. 2000) at 149,258.

[4] McMillin Brothers Constructors, Inc., 91-1 BCA ¶ 23,351, EBCA No. 328-10-84, 1990 WL 140900 at P. 12 (citing *Fruehauf Corp*., PSBCA no. 477, 74-1 BCA ¶ 10,596 (1974) and *Bechtel National*, NASA BCA No. 1186-7, 90-1 BCA ¶ 22,549 (1989).

1.1 Productivity Loss and Disruption

To understand disruption, it is necessary to understand what it impacts. In the context of a construction project or in manufacturing, disruption impacts productivity. Productivity is defined as:

> *A measure of output relative to input. Productivity (or efficiency) is improved by increasing output for a given input or decreasing input for a given output. If the input is specifically work hours, the term commonly used is labor productivity*.[5]

Productivity loss can occur when a contractor does not accomplish its planned production rate.[6] In the context of trade labor hours and equipment hours, productivity loss can be described as a loss of efficiency with respect to contractor producing less than its planned output per work hour of input. Thus, the contractor is expending more effort (hours) per unit of production than originally planned, assuming its planned productivity was reasonably estimated.[7] Expending more hours than was planned typically means expending more money to complete the work. Loss of productivity is caused by a detrimental change in or 'disruption' to planned resource usage, working conditions, or work method, which typically results in increased costs.[8] Productivity losses against the planned rate may also occur if the contractor performing the work is overly aggressive or its estimate of planned performance or various other reasons that are within the control of the contractor.

Productivity involves both labor and equipment efficiency. Some types of disruption claims pertain to equipment disruption, such as in earthwork, mining, and road construction projects. The damages sought for equipment productivity loss may be in the form of additional equipment operators and equipment required or for the cost of the extended duration of the equipment operators and equipment usage, including added standby time.

Disruption is defined as:

> *An interference (action or event) with the orderly progress of a project or activity(ies). Disruption has been described as the effect of change on unchanged work and manifests itself primarily as adverse labor productivity impacts. If such disruption is caused by owner or engineer action (or failure to act), the contractor may be entitled to recover any resulting costs.*[9]

Therefore, disruption is caused by a change to some project dynamic that a contractor ultimately experiences as a negative impact on the planned productivity for work that had not been previously changed. Disruption can impact a contractor's costs and/or schedule.

Parties to a construction project often focus on specific construction site aspects and may lose sight of the interfaces and dynamics between project phases and locations of work. In order to address the full scope of work one must take into account disruption to:

- Engineering
- Procurement (suppliers)
- Fabrication (may be at multiple locations globally)
- Logistics (trains, planes, trucking, sea cargos, etc. - again, often globally)
- Direct work at construction site(s)
- Subcontracted work at construction site(s)
- Indirect labor at field office (site) and home office

[5] AACE International Recommended Practice 10S-90, Cost Engineering Terminology, AACE International, Morgantown, WV (latest revision).
[6] 'Production Rate' or rate of production is the amount of work accomplished during a given unit of time.
[7] Finke, Michael R., *Claims for Construction Productivity Losses*, 26 Pub. Contr. L.J. 311, page 312.
[8] For further discussion concerning calculation of loss of productivity-related damages, refer to AACE International Recommended Practice 25R-03, *Estimating Lost Labor Productivity in Construction Claims*, AACE International, Morgantown, WV (latest revision).
[9] AACE International Recommended Practice 10S-90, Cost Engineering Terminology, AACE International, Morgantown, WV (latest revision).

1.2 Direct and Indirect Disruption

Disruption can be further separated into two primary categories: either *direct* or *indirect*.

Cumulative impact is described as an indirect disruption. Before indirect disruption is described, it is necessary to explain direct disruption. Direct disruption, also known as local disruption, is defined as:[10]

- The direct impact that changed work has on other unchanged work going on around it;[11] and

- The immediate and direct impact resulting from change or other circumstances that lowers productivity in the performance of the changed or unchanged work. Direct impact is considered foreseeable and the disrupting relationship to unchanged work can be related in time and space to a specific change.[12]

Direct disruption affects unchanged work that was temporally and physically near the disrupted work. That is, direct disruption typically affects work occurring simultaneously with or soon after the disruption event. The associated costs to the contractor that result from direct disruption relate to the direct and foreseeable consequences of a change.[13] Refer to AACE Recommended Practice 25R-03 for a list of common causes of lost productivity.[14]

Contrary to direct disruption, indirect disruption, or cumulative impact, does not necessarily affect unchanged work that is temporally or physically close. Also, direct and indirect disruption do not always result from many changes. It is up to the analyst to identify and explain the disruptions and relate to what occurred, including an assessment of the timing of the changes. For example, if most of the changes occurred during the latter part of a project, reduced productivity during the first part of the project most likely does not result from the ripple effect of the later occurring changes.

A common cause asserted for cumulative impact is that it was the result of multiple changes whose impact could not be determined until much later in the project or after the project had been completed. Cumulative impact has metaphorically been described as the disruption caused by a 'thousand cuts'. An individual change does not cause indirect disruption; rather, indirect disruption may be caused by the effect of *multiple* changes. Multiple requests for information (RFIs) can cause cumulative impact in certain circumstances, but an extraordinary number of RFIs alone cannot demonstrate the contractor's entitlement to recovery of its additional direct labor and equipment costs based on cumulative impact.

One way to understand the occurrence of cumulative impact on a project is illustrated by the following decisions:

> *This phenomenon arises at the point the ripples caused by an indivisible body on two or more changes on the pond of a construction project sufficiently overlap and disturb the surface such that entitlement to recover additional costs resulting from the turbulence spontaneously erupts.*[15]
>
> *…[t]he underlying theory is that numerous changes cause a cascading ripple-type of impact on performance time and efficiency which is too uncertain or diffuse to be readily discernable at the time of pricing each individual change.*[16]

[10] See AACE International Recommended Practice 10S-90, Cost Engineering Terminology.
[11] Centex Bateson Constr. Co., VABCA Nos. 4613, 5162, 5165, 99-1 BCA ¶ 30,153 (1998), aff'd, Centex Bateson Constr. Co. v. West, 250 F.3rd 761 (Fed Cir. 2000) at 149,258 (citing Triple "A" South, 94-3. BCA ¶ 27,194, ASBCA No. 46,866 (1994) at 135,523).
[12] Change Orders Productivity Overtime – A Primer for the Construction Industry, MCAA, 2012, p. 82, citing Centex Bateson Constr. Co., VABCA No. 4613, 5162, 5165, 99-1 BCA ¶ 30,153.
[13] Long PE, Richard J. et al, Cumulative Impact and Other Disruption Claims in Construction, 2014, Virtualbookworm.com Publishing, Inc., College Station, TX., §1.1.2, p. 6.
[14] See AACE International, Recommended Practice 25R-03, *Estimating Lost Labor Productivity in Construction Claims*, pp. 4-7 of 29.
[15] Centex Bateson Constr. Co., VABCA Nos. 4613, 5162, 5165, 99-1 BCA ¶ 30,153 (1998), aff'd, Centex Bateson Constr. Co. v. West, 250 F.3rd 761 (Fed Cir. 2000) at 149,258.
[16] McMillin Bros. Constructors, Inc., EBCA No. 328-10-84, 91–1 BCA ¶ 23,351.