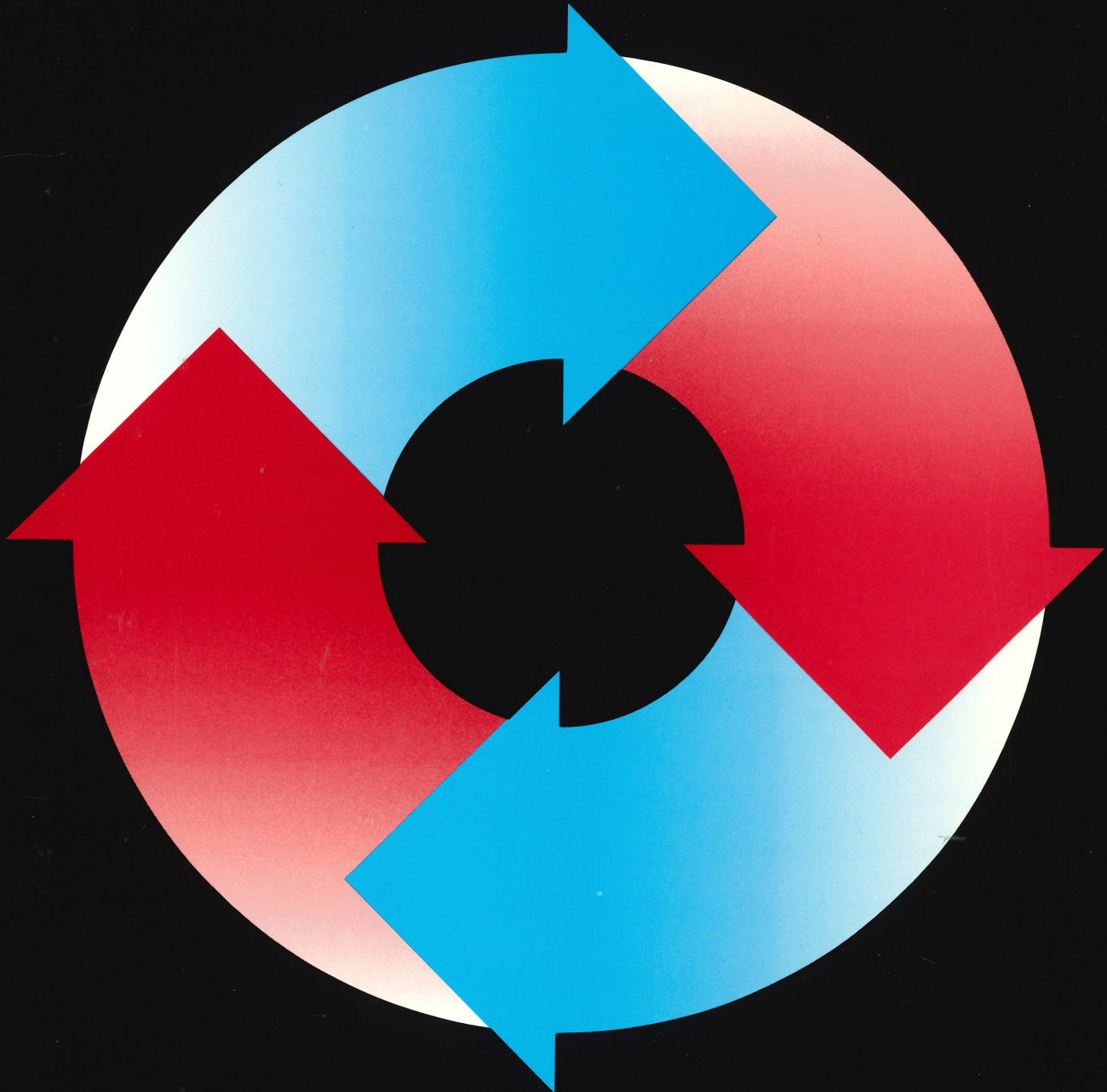


Implementation Process for Improved Quality in Plants/Divisions

A Special CII Publication

December 1992



Documents
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TOPICS

The purpose of the publication is to make available to industry the results of research conducted by the Construction Industry Institute (CII). The publication does not necessarily represent the views of CII member companies, but is offered as a contribution to the industry.

CII was founded in 1983 to improve the cost effectiveness of the nation's largest industry. The members, who represent a broad cross-section of owners and contractors, believe that many of the problems that limit cost effectiveness are common ones, and that real improvements can be best accomplished in a cooperative environment with the benefits being shared by the construction industry at large.

CII uses the acronym TOPICS to describe the research effort. TOPICS signifies the six research thrust areas: Technology, Organization, People, Information, Controls and Sigma (meaning others). The task forces for each area are listed below:

Technology

- Advanced Technological Systems
- Computer Integrated Design & Construction
- Constructability
- Electronic Data Management
- EPC Flexibility
- Environmental Remediation Technology
- Modularization
- Technology
- Technology Strategy
- Technology Survey

Organization

- Constructability Implementation
- Management of Project Changes
- Partnering
- Project Organization
- Project Team Building
- Project Team Risk/Reward Allocation

People

- Americans with Disability
- Construction Work Force
- Drug-Free Workplace
- Education and Training
- Employee Effectiveness
- Safety
- Zero Accidents

Information

- CICE Impact Evaluation
- Industry Data & Statistics
- International Construction
- International Standards
- Model Plant
- Owner Engineering Organization
- Project Management Assessment Survey

Controls

- ASCE Quality Manual
- Change Order Impacts
- Contracting, Phase II
- Contracts
- Cost/Schedule Controls
- Design
- Dispute Prevention and Resolution
- Materials Management
- Overtime
- Overtime, Phase II
- Productivity Measurements
- Quality Management
- Quality Performance Measurement
- Total Quality Management

Sigma

- Construction 2000
- Insurance
- Piping Function
- Retrofit Projects
- U.S. Navy Demonstration Project
- Workers Compensation



**Implementation Process
for Improved Quality in Plants/Divisions**

CII Plants/Divisions Action Team

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The University of Texas at Austin.

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Implementation Process for Improved Quality in Plants/Divisions

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1. Introduction

Purpose

The purpose of this publication is to provide you with a guide to implement Construction Industry Institute (CII) concepts in your company's various plants and divisions. The focus is toward large, decentralized companies. The guide is generalized; each company will have to tailor it to its own structure and specific needs.

This publication consists of:

- a workbook to assist member companies in setting up a program to implement CII concepts
- commentary on the workbook's use

The commentary is to provide you with suggestions about the information needed in the workbook.

CII publications address topics that member companies identify as presenting major potential for improving productivity and cost effectiveness. The tools, techniques, methods and information described in CII publications concern such topics as automation, constructability, contracts effectiveness, design effectiveness, materials management, productivity, project control systems, project organization, quality and many others.

CII members can promote the adoption of CII concepts through citing Return on Investment (ROI) information stated in CII publications. For example:

- The average cost of rework on industrial projects exceeds 12 percent; the U.S. construction industry is wasting over \$17 billion annually in rework on industrial projects and it could lessen that amount significantly through reducing quality deviations in design and construction (CII Publication 10-1, 1989).
- Owners and contractors can save 6% on craft labor productivity through integrating materials management systems (CII Publication 7-1, 1986).

Integration with Quality Process

If your company has a Total Quality Improvement Process (by whatever name), you should use it to implement CII concepts rather than establishing a competing CII implementation program. CII concepts are designed to improve quality and safety, save time and money, enhance employee job satisfaction and improve relations among suppliers, customers and owners, so they are natural candidates for quality improvement initiatives. In most companies the quality improvement process has been elevated to the highest levels and has the support of top management. Take advantage of this support and all available facets of the existing quality improvement process whenever possible to implement CII concepts.

Executive leadership and Resolve

A high corporate officer (preferably the CEO) must be committed to the implementation program for it to succeed. This executive must understand the need for adopting the concepts CII recommends, make a public announcement of the company's commitment, and have the resolve to follow up on the implementation program.

Using This Publication

You should briefly review the workbook in Appendix E before proceeding. This workbook exactly parallels the 13 steps outlined in this publication. It is an easy to use tool, and when filled out, will help establish a formal CII implementation plan in your company. You may want to follow along in the workbook now as you read further and jot down notes.

Although the implementation plan is developed in the following section and outlined in the workbook, the 13 steps can be rearranged to suit your company. The important thing is to develop an implementation plan and execute it.

2. Initial Planning Phase

Identify Corporate CII Champion

Senior management, the highest corporate officer in particular, must foster the implementation of CII concepts for the implementation process to succeed, and the effort must be organized. The first person to identify is the CII corporate champion. That person should be a strong, dynamic leader who is influential and recognized throughout the company. This high-ranking individual should be innovative, willing to change, knowledgeable about CII and the construction industry, and committed to quality. The corporate champion must also have enough authority to accomplish the objectives of the CII implementation program. The corporate champion will lead a corporate CII steering committee.

Establish Corporate CII Steering Committee

Members of the corporate steering committee should include, for instance: the head of the corporate engineering department, the manager of projects in engineering and construction, and a representative from each plant/division (preferably the plant/division CII champion). The steering committee will be responsible for overall direction for implementing CII concepts throughout the company. The corporate steering committee members from the plants and divisions should be leaders of the local implementation teams. They should either represent the company in CII or maintain close communication with the company's CII participants.

For CII implementation to be successful, the corporate steering committee should meet regularly at the various plants and divisions to exchange ideas with the local leadership and to demonstrate continuing corporate support. The committee must also work closely with any corporate quality improvement teams.

Define Long-Term Improvement Goals

The CII corporate champion and steering committee should define long-term improvement goals and examine CII publications to identify the CII concepts that will help the company achieve those goals. The statement of improvement goals should indicate how implementing CII concepts will benefit the company. Major goals usually center on increasing profits through various means, such as:

- reducing costs and improving quality in design, construction and production
- improving safety performance
- improving schedules
- developing a trained, committed and motivated staff of employees.

The company should use the CII Self-Assessment Survey to determine its current status, benchmark its achievements against those of the industry and set goals for the future.

Develop CII Mission Statement

The corporate champion and steering committee should develop a positive and inspiring mission statement that they can all support. The mission statement should explain the benefits that implementing CII concepts will bring to the company and its employees. The statement should be comprehensive, detailed, and rooted in CII goals. (see Sample Corporate CII Mission Statement, Appendix B).

If the company has an active quality improvement process, the CII mission statement should explain how CII implementation will be integrated into the process and be complementary to it.

Prepare Top Corporate Executive Message

The CEO or the top corporate executive should announce the CII implementation program to the company in a special message. The medium may vary according to circumstances. It could be a live announcement, a video presentation or a written message such as a letter or an article in the company newsletter. It might even be all those: a live announcement videotaped for presentation in remote locations, a letter to selected company employees and a follow-up article in the company newsletter. The CII top corporate executive message should be delivered to everyone in the company associated with engineering and construction.

The message could, for example:

- express the company's commitment to implementing CII concepts
- emphasize that CII implementation is a key element and is to be viewed as part of the company's quality program
- explain that the U.S. construction industry must improve or risk losing its leadership position in the world market. International competitors are committed to quality improvement, which CII is fostering through its research, and the U.S. construction industry must adopt quality measures such as the CII concepts or fall behind.

The message should explain the benefits to the company. For instance, it might say the company expects to increase profits by n% in the next 5 years through:

- improving productivity by n%
- reducing the amount of rework to less than n%
- reducing overall construction costs by n%.

The message should clearly state that CII implementation is part of, and not in competition with, the company's quality improvement process.

Establish Local Implementation Teams

Each plant and division will need to establish local implementation teams, with help from the corporate CII steering committee and corporate champion. Potential members include plant and division engineers, the chief engineer, the safety engineer, the plant/division manager, construction managers and the quality manager. Each local team needs members knowledgeable and enthusiastic about CII and its recommendations. The chairman of the local team is a representative on the corporate steering committee. Each local team needs to be aware of the company's quality improvement process and work through any quality teams that exist.

Expand Participation in CII Activities

One of the first objectives of the CII implementation teams should be to assess the local level of participation in CII activities. These teams should determine who, if anyone, is working on CII task forces or action teams, or attending the Annual Conference, workshops or local user council presentations. Experience has shown that people who participate in CII learn much about the tools, techniques and methods it recommends and thus can promote implementation of CII concepts in their companies.

Local leaders in the plants and divisions should become involved in CII activities. CII participants could take other company employees as guests to CII functions. Management could assign additional employees to serve on CII task forces or action teams. The company could encourage employees to attend CII workshops and conferences.



Create CII Communication Network

CII needs high visibility within a company to accomplish its goals. The corporate CII champion should coordinate publicity for CII throughout the company. The champion should also assign duties to CII members throughout the company or designate staff specifically to publicize CII activities.

The corporate champion might establish a CII newsletter or procure a corner in the corporate newsletter (see Sample Corporate Newsletter, Appendix C). The company could publish a CII calendar of upcoming events. Summaries of meetings, lists of key CII contacts, stories of successful implementation of CII ideas, and letters to the editor or suggestions/commentaries might be published. The corporate CII group can issue press releases and publicize successes and rewards. The corporate champion should also support publicity for CII activities within plants and divisions.

Local CII champions should supply publications in their plants and divisions with stories about CII. They need to share information about local CII events, invite participation, and describe efforts at implementing specific CII ideas in the plant or division. The CII Products Catalog should also be distributed.

Evaluate CII Products

To establish an effective implementation plan, personnel in the company and its plants/divisions must take full advantage of CII products and be completely aware of the various CII concepts (see List of CII Concepts, Appendix A). Each CII product and concept must be evaluated, with the company and its plants/divisions specifically in mind, and the benefits weighed against the costs. An analysis of each CII concept is essential to any successful implementation program.

Key questions to ask during this analysis are:

- What is the concept?
- What is the current level of implementation of this concept in the plant/division?
- Would the benefits outweigh the cost?
- Should implementation be pursued now, later or never?

A useful device for evaluating and disseminating the publications within the company is a publication review form. A team or an individual should review each publication as received, summarize it briefly, determine which departments and projects could benefit from getting it, and use the form for routing and documentation (see Sample Publication Review Form, Appendix D).

The corporate CII steering committee, corporate champion and local implementation teams in company plants and divisions need to examine and evaluate existing CII publications thoroughly to assess the value of each to the company. They will need to determine which improvement ideas should be implemented, in what sequence, and on which projects or processes. Authors and members of the teams that sponsored original research are further sources of information on practices selected for implementation.

Use the Publication Review Forms (whether reviewing new or existing publications) to provide recommended actions or process improvements to whatever quality improvement process your company has established. Take advantage of existing quality improvement teams whenever possible and avoid competing initiatives.

Each member company receives CII publications regularly. CII issues its research results in the form of Source Documents

(reports from universities) and Publications (normally executive summaries). Source Documents and Publications are distributed to member companies, and may be copied (they are not copyrighted) or additional copies purchased from CII. In addition, CII produces videotapes and special publications, such as reports and computer tutorials.

The CII Products Catalog lists and provides abstracts for all publications classified by publication type (Publication, Source Document, Videotape, Special Publication) and subject areas.

Develop CII Education/Training Program

Education and training in CII concepts are crucial to implementing them. The corporate champion, CII steering committee and CII representatives should develop an aggressive CII training program. The CII steering committee should designate someone to maintain up-to-date CII course lists and schedules and identify other training opportunities. The company should consider developing in-house CII training. CII Project Management Training Modules can be used to facilitate in-house training. In-house training could include recruiting CII facilitators and consultants to train personnel on-site. The company should maintain and publicize a CII library.

Establish Performance Measures

Implementing CII concepts will benefit your company, but goals must be established and tracked to demonstrate this benefit. An essential feature of any quality improvement process is the ability to measure performance and develop hard facts upon which to base decisions. Performance measurements will show that the payback of CII implementation outweighs the costs.

Example performance measurements are: actual vs budget cost, actual vs planned completion date, safety performance, and actual vs planned production. CII research already documents some of the methods which can be used to measure:

- Construction Productivity (CII SD-13)
- Design and Construction Quality Costs (CII SD-30)
- Design Effectiveness (CII SD-16)

Although sometimes difficult, documenting the improvement is necessary. The first step is to document the current performance measures for your company's projects. This will provide the baseline with which CII implementation improvements can be compared.

Develop Pilot Projects

Pilot projects demonstrate the value of CII concepts. The performance measures from pilot projects can be plotted against those for projects adhering to standard operating procedures. Controlled pilot projects are attractive in that they enable companies to change procedures temporarily for a specific project, are limited in scope and time, and thus help to measure the benefits of change. The benefits can then be publicized.

Refer to the CII Special Publication, *Pilot Projects: Tools for Implementation*, for a thorough description of how to establish pilot projects. The following is simply an outline.

The corporate CII steering committee should consult with local implementation teams, help them choose an appropriate project for a pilot and select team members to run it. Be sure to work through any existing