WESTON SOLUTIONS
QUALITY MANAGEMENT MANUAL

DECEMBER 2009

TABLE OF CONTENTS

FIGURES

LIST OF ACRONYMS

BBS	Behavior-Based Safety
CBT	Client Business Team
CoP	Community of Practice
CQC	Construction Quality Control
CSI	Construction Specifications Institute
CSM	Client Service Manager
EHS	Environmental Health and Safety
EMR	Experience Modification Rate
IDP	Individual Development Plan
ISMS	Integrated Safety Management System
LAN	Local Area Network
OU	Organization Unit
PC	Profit Center
PDCA	Plan, Do, Check, Act
PLC	Project Lifecycle
PM	Project Manager
PO	Purchase Order
PPT	Procurement Planning Tool
QA	Quality Assurance
QC	Quality Control
QMM	Quality Management Manual
QMS	Quality Management System
OP	Operating Procedure
ORIR	OSHA Recordable Incident Rate
RAS	Revenue Authorization Summary
RFP	Request for Proposal
TPM	Technical Publications Manual
WAN	Wide Area Network
WESTON	Weston Solutions, Inc.
WGII	WESTON Global Incident Index
WRIR	WESTON Recordable Incident Rate
WSU	Weston Solutions University

SECTION 1: EXECUTIVE SUMMARY

Our quality goal at Weston Solutions, Incorporated (WESTON), is to achieve exceptional quality every time. To accommodate the wide diversity of clients and projects, Weston's Quality Management System (QMS) has been designed to be flexible, while providing necessary direction to effectively manage quality at each phase of the project.

WESTON's holistic and scalable approach to quality is a multifaceted concept that is completely integrated into our operations. Exceptional quality is achieved through a thorough understanding and focus on each aspect of quality, as shown in the WESTON Quality Constellation and described in detail in this Quality Management Manual (QMM).

Client Engagement represents WESTON's commitment to focus on our clients. Using the Project Quality Pledge, Client Business Team organization, and proprietary management systems such as EngageTrack, our clients' exceptional performance expectations are translated into the requirements for our project teams to deliver high quality solutions that consistently meet or exceed our clients' expectations.

The foundation of **Project Planning** is WESTON's proprietary Project Lifecycle (PLC), a system of guidelines and tools designed to create a common approach for project planning & tracking, managing risk, and decision making. The PLC creates a common approach for how WESTON manages opportunities and projects from Opportunity Identification through Project Closeout across the company. The PLC, along with other Project Management Tools, Project Plans, and Procurement Tools form the backbone of quality at the Project level.

Technical Execution focuses on exceptional quality at the task level. This includes the use of quality assurance (QA) plans, quality control (QC) reviews, and discipline-specific quality manuals, such as the WESTON Construction Support Group Quality Management Manual, Engineering Design QA Management Plan, and Integrated Air Services Quality Management Plan.

Successful Completion means that WESTON has delivered Exceptional Quality. Sharing lessons learned internally within WESTON strengthens our organization to continually improve our processes and ultimately the results we deliver to our clients. The benefits of our QMS provide value and strengthen relationships with our existing clients and create a bridge to strong relationships with new clients. Successful completion means our clients associate WESTON with high-quality deliverables and services, and select WESTON over our competitors for highly challenging and rewarding work.

SECTION 2: PURPOSE AND SCOPE

This Quality Management Manual (QMM) describes the quality management system (QMS) employed by Weston Solutions, Inc. (WESTON®). The QMS is presented in a framework aligned with the ISO 9001:2008 standard. Because much of WESTON's QMS is consistent with ISO 9001, WESTON has deemed organizing its QMM in this format appropriate.

The purpose of this QMM is to describe and document how WESTON delivers quality. WESTON assembles teams that leverage technical and managerial expertise to meet or exceed client objectives and expectations. This QMM applies to all WESTON employee-owners and their activities, and is to be used to consistently provide high-quality deliverables and services.

2.1 REVISION HISTORY

This 2009 QMM is the first edition to follow the ISO 9001 organizational framework.

SECTION 3: COMPANY PROFILE

3.1 MISSION AND CORE VALUES

WESTON's mission statement is as follows:

> *"Grow sustainable value for our clients, employee-owners, and communities by integrating teams and innovative approaches to solve emerging, complex problems for the environment and infrastructure worldwide."*

To accomplish this mission, WESTON's employee-owners are guided by the Company's core values:

- Integrity
- Client Focus
- Teamwork
- Safety
- Exceptional Quality
- Making a Difference

While quality is a component of each of these core values, WESTON's focus on quality is embodied in its core value of Exceptional Quality.

3.2 QUALITY POLICY

WESTON's core value of Exceptional Quality defines its quality policy:

> *"WESTON's goal is exceptional quality—every time. We build an understanding of how the client defines success and align project-specific quality plans with client expectations. We focus on continuous improvement, while we foster technical excellence and innovative solutions."*

It is WESTON's policy to provide services that consistently meet agreed-upon requirements of both internal and external WESTON clients. WESTON will provide services and deliverables that are technically, scientifically, and professionally ethical and defensible. Furthermore, it is WESTON's policy to maintain a sustained, continuous improvement philosophy such that its work processes are constantly examined and improved for the benefit of WESTON and its clients. This improvement is important to the success and longevity of WESTON as well as to its clients.

SECTION 4: QUALITY MANAGEMENT SYSTEM

4.1 WESTON'S QMS—DEVELOPMENT, IMPLEMENTATION, AND IMPROVEMENT

A one-size-fits-all approach to quality would not be successful at WESTON due to the wide diversity in its clients and projects. To accommodate the range of projects performed and delivered by WESTON, WESTON's QMS must be flexible, while providing enough direction to effectively manage quality at each phase of the project. Therefore, WESTON has developed a scalable approach that can be effective whether the project size is $5,000 or $50 million.

To effectively meet the challenge of its mission, WESTON's management subscribes to a continuous learning philosophy that creates an environment that will encourage all employee-owners and team members to accomplish the following: (1) identify client needs and expectations (internal or external); (2) establish agreed-upon quality requirements; (3) meet the agreed-upon requirements on time and within budget; and (4) continuously improve the services and deliverables that WESTON provides.

WESTON ensures that its quality objectives will be met by three basic approaches. First, WESTON prioritizes appropriate levels of client communication and staff/technology capabilities so that work is performed to meet client needs. Second, WESTON is dedicated to the development and application of improved technology in all aspects of professional services. Third, WESTON utilizes internal controls to provide reasonable assurance that activities are proceeding as planned and quality objectives are being met.

Quality is a multifaceted concept that is not a separate project task but rather inherent in every project task. Exceptional quality results from a thorough understanding and focus on the client, project, and task.

To achieve **client** engagement, a WESTON project team must first understand how its client defines exceptional performance for the project at hand. This understanding is obtained through discussions with the client, and is documented and shared in the Project Quality Pledge, which is discussed in Subsection 4.4.3.

To achieve exceptional **project** quality, a WESTON project team must evaluate how the project can be planned and performed to optimize value creation for the client and WESTON. This optimization results from the collaborative discussion between the client and the WESTON project team.

A project is as successful as the individual tasks that comprise it. To achieve quality on individual **tasks**, WESTON focuses its efforts on technical execution. This includes the use of quality assurance (QA) plans, quality control (QC) reviews, and discipline-specific communities of practice (CoPs) to share best practices and lessons learned.

WESTON has developed, implemented, and documented a multi-tiered QMS structure, as shown in Figure 3-1 and described below:

Step	Action
1	WESTON's Executive Management establishes the company's core value of Exceptional Quality.
2	This core value is reflected in WESTON's Quality Policy, which is embodied in the Quality Pledge taken by all employee-owners.
3	In addition to WESTON's corporate Quality Management Manual (QMM), quality plans, expectations, and procedures are developed for individual service lines, client-based programs, and projects, and are periodically reviewed and updated.
4	WESTON performance is continually evaluated using audits, progress checks (by managers), root-cause analyses (by members of the corporate Quality Department), and other assessments and reviews. Client feedback is a critical component of this evaluation.
5	Corrective actions, best practices, and lessons learned are shared both among the project team and throughout WESTON for continual improvement.
6	Significant findings and trends are assessed by the Quality Department and elevated as appropriate to Executive Management and Quality Leadership, who may make systematic changes. These changes may be reflected in WESTON's Quality Policy and/or its quality manuals.

FIGURE 4-1 WESTON'S QUALITY MANAGEMENT SYSTEM PROCESS

4.2 DOCUMENTATION OF QMS

This QMM provides the scope of WESTON's QMS and serves as a reference document. The sections of the QMM are aligned with ISO 9001:2008.

WESTON also has developed and implemented a quality guidance document called the *Profit Center (PC) Quality Guide*, which outlines WESTON's quality tools and resources for internal use to enhance WESTON's ability to meet its clients' exceptional quality objectives.

4.3 CONTROL OF QUALITY SYSTEM DOCUMENTS

Any revision to the QMM must be approved by the Corporate Quality Manager. The QMM is updated every 5 years, or more frequently if necessary.

The *PC Quality Guide* is updated annually. Any revision must be approved by the WESTON Corporate Quality Manager.

These documents are available to all WESTON employee-owners on the Quality Management site on WESTONPortal. However, only the Corporate Quality Manager can post revisions to these two documents.

SECTION 5: MANAGEMENT REQUIREMENTS

5.1 MANAGEMENT COMMITMENT TO QUALITY

WESTON's top management is committed to the development and implementation of the QMS and its continual improvement. To fulfill this commitment, management established Exceptional Quality as a company core value, and commissioned the preparation of this QMM. Management also recognized a network of quality managers within WESTON who are committed to communicating the importance of achieving clients' exceptional performance objectives and to ensuring that WESTON's quality objectives are established and met for each project. Management also emphasizes that continual improvement is an essential component of WESTON's QMS through sharing of best practices and lessons learned at all levels of the company.

WESTON management understands that customer *(client)* focus is the most critical element in achieving client satisfaction and engagement. WESTON intends to enhance client satisfaction and engagement by understanding client requirements, consistently meeting client expectations, and clearly communicating with clients on cost, schedule, and quality issues.

5.2 CUSTOMER *(CLIENT)* FOCUS

WESTON's top management is committed to ensuring that customer focus is maintained and customer requirements are clearly defined and met. Customers' exceptional performance expectations are translated into the requirements for quality processes within both the project team and WESTON itself.

WESTON's customer focus is embodied in the way that the company is organized, shares information, and rewards performance, as described in the following subsections.

5.2.1 Organization

WESTON is organized around Client Business Teams (CBTs), which shape the performance of its offerings within each market segment. The responsibilities of the CBT leaders include the following:

- Drive improvements in client engagement through zippered relationships, superior project performance, and teams aligned around account plans.
- Act as client advocate to ensure resolution of Key Client problems and conflicts.
- Verify EngageTrack ratings (see Subsection 6.2) while driving account plan upgrades and implementation.
- Align interests at all levels around efforts needed to achieve strategic milestones.
- Ensure availability of key resources needed for critical efforts.

Client Service Managers (CSMs) within each CBT are responsible for understanding their clients' needs, requirements, and objectives, and sharing them with the proposal and project teams.

5.2.2 Customer-Related Information and Communications

WESTON employs an internal system called EngageTrack to record and share key information and communications related to WESTON clients and their needs. EngageTrack is described in detail in Subsection 6.2.1.

5.2.3 Client Engagement Awards

In 2005, WESTON introduced the Blue Ribbon Client Engagement Award, which is presented each year to recognize client teams that exemplify the highest standards of client engagement. Awardees meet the following standards:

- Serve a significant account.
- Consistently demonstrate the fundamentals of client engagement.
- Exhibit the characteristics of a truly engaged client relationship.
- Make a significant achievement that creates value for the client and WESTON.

The winning teams receive a plaque for display in their WESTON office, and each team member receives a memento. In addition, the team typically commemorates its accomplishment by holding a celebratory event with its client. WESTON teams also have the option of making a donation on the client's behalf (consistent with client and legal requirements) to a cause that is meaningful to the client, providing WESTON project teams with an opportunity to live out the WESTON core value of "Making a Difference" by coordinating an event or pledging a donation to help those in need in the community.

5.3 QUALITY PLEDGE

The customer focus at WESTON is embodied in its Quality Pledge, which is the commitment that each employee-owner makes to WESTON clients to ensure that the daily efforts of WESTON employee-owners are aligned with WESTON clients' needs. The Quality Pledge consists of four basic tenets:

1. I will understand client needs and communicate them to the team.
2. I will establish a project-specific quality pledge and track performance against metrics.
3. I will frequently follow up with my clients to make sure we are on track.
4. I will capture lessons learned and share them for continuous improvement.

Upon hire, WESTON employees take the Quality Pledge to ensure that they maintain a quality focus from the start.

The application of the Quality Pledge at the project level is described in Subsection 4.4.3.

5.4 QUALITY PLANNING

5.4.1 Visioning Process

Successful companies look beyond a single year, creating longer-term visions and the strategies to achieve them. WESTON has done this several times over the last 10 years, involving many employee-owners in the process of creating a clear vision, one that aligns WESTON efforts to ensure WESTON remains relevant as its marketplace changes. As of this writing, WESTON is implementing its 2010 Vision, and will soon begin developing its next vision.

The visioning process begins with a series of meetings held at various locations across WESTON. In developing the 2010 Vision, each meeting is facilitated by an executive manager who collects employee-owner suggestions and input. The input from all the meetings is synthesized into discrete vision elements. Teams are built around each vision element. Once these teams have developed the

path forward, implementation teams take over to make the vision a reality. WESTON repeats the process every 4 or 5 years and, in this way, WESTON continually reinvents itself and can adapt to changes in the marketplace, technology, and employee-owner needs and aspirations.

5.4.2 Annual Goal Setting and Planning Process

Each year, divisions, PCs, and departments throughout WESTON develop goals and plans for the coming year. The goals and plans are discussed with senior management, and necessary modifications are made until the goals and plans are approved. This process ensures alignment of goals among all groups and throughout the corporation.

5.4.3 Project Quality Pledge

Living by the core value of "Exceptional Quality" means WESTON delivers products and services that meet the highest standards. In doing so, WESTON strives to identify, understand, and execute the project scope of work according to its clients' exceptional performance expectations. The Project Quality Pledge is the process WESTON uses to ensure that its clients' exceptional performance expectations are met—every time.

The Project Quality Pledge is WESTON's Quality Pledge applied at the project level. The Project Quality Pledge provides a means of documenting and sharing with the project team Key Client needs, measuring project success, and checking performance with the client.

All Project Quality Pledges are different. A Project Quality Pledge can be very detailed or streamlined; a stand-alone document or incorporated into the Project Execution Plan or Project Instructions. What is important is that each Project Quality Pledge makes sense to the client and the WESTON team.

The three most important building blocks of a successful Project Quality Pledge are as follows:

- Talking to the client.
- Understanding the client's exceptional performance expectations.
- Communicating client expectations to the team.

Talk to the Client

One cannot ascertain the client's exceptional performance expectations without talking to the client. WESTON must initiate and sustain a dialogue with its clients. The "client" may include several stakeholders, so communication is essential. Key actions include the following:

- Focus on exceptional performance expectations in all project phases (proposal to completion).
- Hold regularly scheduled discussions with the client to ask about WESTON's performance.
- Schedule client-WESTON meetings if any Key Client contacts change.
- Review/revise quality goals if client expectations change.
- Document and address client issues or suggestions and share with the team.

Understand the Clients' Exceptional Performance Expectations

The Project Quality Pledge highlights WESTON's overall commitment to the client, including a statement describing that commitment. WESTON employee-owners must ask themselves: "What is the shared vision?" Key actions include the following:

- Define the clients' exceptional performance expectations. These expectations translate into one or more goals included in the Project Quality Pledge.
- Develop the Project Quality Pledge. The lead for this effort is typically the Client Service Manager (CSM) or Project Manager (PM).
- Identify and link WESTON and client contacts to ensure zippered communication. These contacts can be recorded in the Project Quality Pledge or elsewhere; the point is to link WESTON and client contacts.

Communicate Client Expectations to Your Team

To meet the client's exceptional performance expectations, WESTON secures the project team's commitment to those expectations. Each team member should not only understand the Project Quality Pledge, but should also be able to articulate it to others and identify his/her specific role in achieving it. Key actions include the following:

- Discuss the Project Quality Pledge at the kick-off meeting and regularly scheduled project meetings.
- Ensure each team member understands the Project Quality Pledge, and his/her specific role.
- Have team members sign the Project Quality Pledge. The Project Quality Pledge can define each person's specific role along with their signature, or provide a signature page for the overall pledge.

5.5 QUALITY SYSTEM CONTROL

5.5.1 Quality Organization

The Quality Network, depicted in Figure 4-1, is composed of individuals across WESTON who help promote the delivery of quality to WESTON clients, both internal and external. The network consists of the following:

- Corporate Quality Leader
- Corporate Quality Manager
- Construction Support Group (CSG) Quality Managers
- Service Line Quality Managers
- Division QA Officers
- Profit Center Quality Leads

These Quality representatives (with the exception of the PC Quality Leads) participate in a monthly conference call to discuss quality issues. The information discussed is subsequently communicated by the Division QA Officers to the PC Quality Leads and throughout the operating divisions.

The Corporate Quality Manager maintains an internal Quality Network site on WESTONPortal that contains information of value to the Quality Network, such as summary notes from the monthly

Quality Network meetings, draft quality documents undergoing review, and information on the annual Quality Leadership Conference. The list of Quality Network members is also maintained and updated on the site.

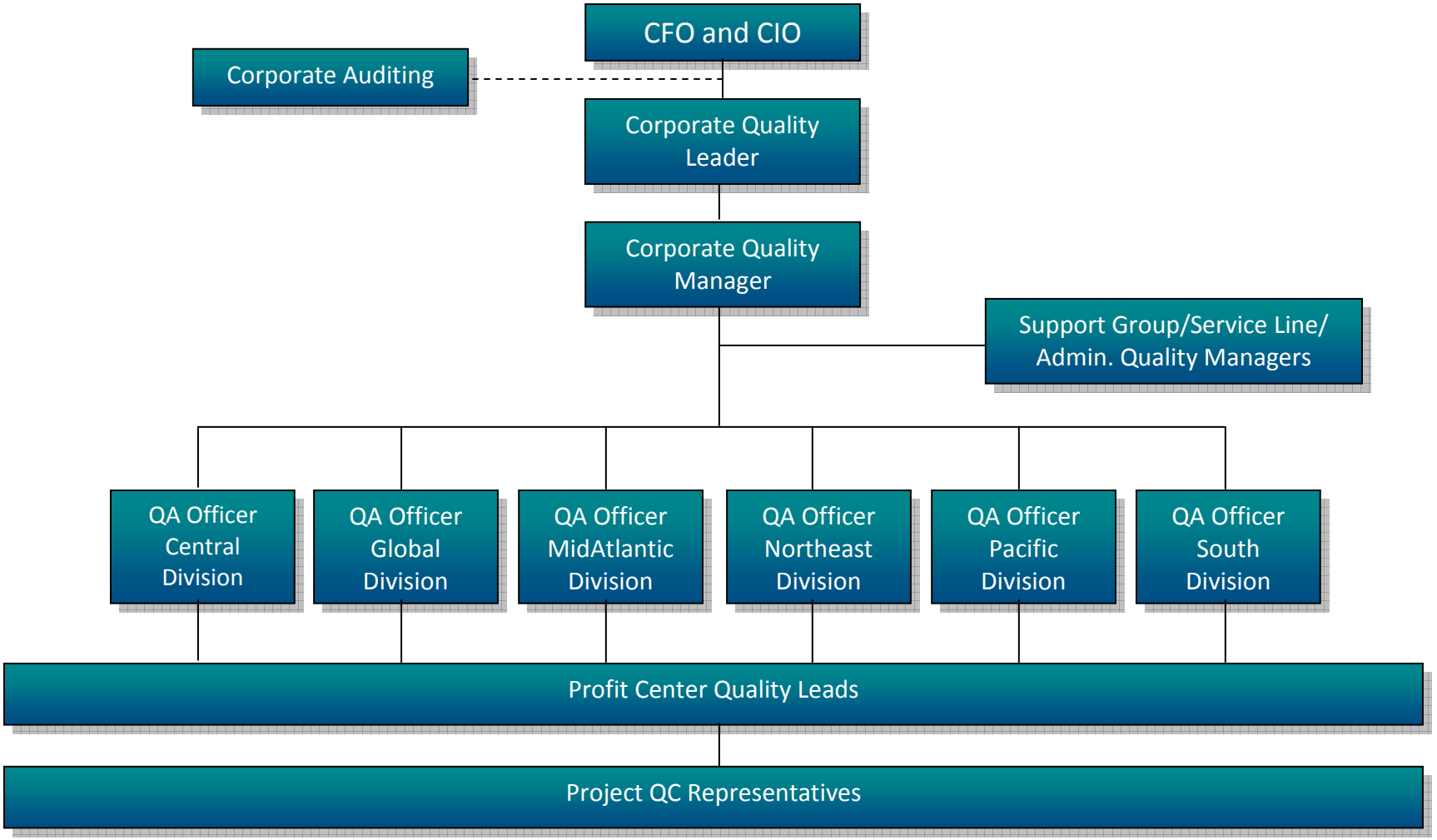


FIGURE 5-1 WESTON'S QUALITY ORGANIZATION

Many PCs have found it beneficial to establish a PC Quality Committee to engage representatives from the various functional areas in the quality process. The PC Quality Committee typically holds a monthly 1-hour quality meeting to obtain suggestions for improvement and to disseminate quality information.

5.5.2 Project Quality Representatives

Each project is assigned a Project QC Representative who has experience appropriate for the project. In this role, the Project QC Representative maintains a dotted-line relationship to the quality management organization. The Project QC Representative performs the following, as applicable:

- Assist in the development, review, and implementation of the Project Quality Pledge and other project quality plans.
- Work with the PM to ensure that project team personnel understand the elements of the Project Quality Pledge and WESTON's QMS.
- Ensure that current versions of project documents (e.g., Project Quality Pledge, QA Plans, procedures, health and safety plans, regulations) are available to project personnel (document control).
- Confirm that QA/QC requirements as outlined in the project planning documents are being implemented by the project team and subcontractors, and communicate issues to the PM and project team.
- Ensure that the appropriate reviews of deliverables and data have been performed and documented.
- Participate in project audits, progress checks, reviews, and corrective actions.

If a specific person is not named (primarily on projects below the PC Manager signature authority), the Project Manager may serve as the Project QC Representative. On construction projects, the site manager (may also be referred to as a construction superintendent) may serve in that role. On construction projects performed under the requirements of Unified Facilities Guide Specification (UFGS) 01451, Project QC Representatives (may also be referred to as Construction Quality Control, or CQC System Managers) have the authority to stop work and also have additional responsibilities as described in UFGS 01451.

5.5.3 Quality System Forums

Information about quality is disseminated in a variety of methods, as described below.

WESTON holds a 2-day Quality Leadership Conference each spring. Any WESTON employee-owner can attend. The attendees participate in a variety of sessions related to quality, most of which are interactive. Feedback from post-conference surveys is used to shape the following year's conference.

Quality Corner articles are featured regularly in *The WESTON Reporter Wire*, WESTON's weekly news source sent to all employee-owners electronically. The *Quality Corner* articles cover topics related to quality and have proven especially useful for sharing best practices across divisions.

Various PCs have also developed newsletters highlighting quality programs, best practices, and lessons learned, and have used such newsletters to recognize superior performance.

5.6 MANAGEMENT REVIEWS

Executive Managers meet with each Division Manager and other division management staff monthly to discuss division performance. Quality is one of the topics discussed. The quality discussion focuses on the Quality Scorecard, which is completed and reviewed monthly (see Subsection 7.1).

To complete the Division Quality Scorecard, Division management asks each PC to complete its own Quality Scorecard to provide a basis for the Division's Quality Scorecard. PC Managers are ultimately responsible for rating each scorecard element, although they will typically ask for assistance/input from others.

The first sheet of the Quality Scorecard asks for the rating, comments, and action items for each element, and the second sheet provides definitions/descriptions of on-target, at risk, and off-target ratings for each scorecard element. Quality issues identified are accompanied by corrective actions to resolve each issue.

SECTION 6: RESOURCE MANAGEMENT

6.1 QUALITY RESOURCES

6.1.1 Quality Management Site

WESTON's Quality Management site on WESTONPortal houses over 400 tools, documents, templates, best practices, and links designed to help WESTON employee-owners achieve their quality objectives. The site includes useful links and a list of quality contacts, and stores tools and resources under the following tabs:

- **Project Quality Pledges**: Examples, guidance, and presentations.
- **Quality Program Plans/Manuals**: Corporate (this manual), PC, client/program, support group, technical disciplines.
- **Quality Organization**: Quality Network Contacts, organization charts, role descriptions.
- **Communications and Meetings**: Quality presentations (e.g., from Quality Leadership Conferences), *Quality Corner* articles, graphics.
- **Metrics**: Quality Scorecards, project quality metrics.
- **Forms and Templates**: Tools to help with document QC, inspections, audits, proposal development, and project planning and execution.
- **Other QA/QC Tools**: Guides, Quality newsletters, and root-cause analysis.

The Quality Management site is maintained by the Corporate Quality Manager.

6.1.2 Quality Network Site

While the Quality Management site is for all WESTON employee-owners, the Quality Network site serves members of WESTON's Quality Network. The Quality Network site on WESTONPortal provides quality program priorities, the agenda and summaries of the monthly Quality Network meetings, topics and presentations from the annual Quality Leadership Conference, and draft quality tools and resources being reviewed prior to companywide distribution. The site is managed by the Corporate Quality Manager.

6.1.3 PC Quality Guide

WESTON's PC Quality Guide is designed to assist WESTON PCs in establishing and maintaining a program that enables them to reach or exceed the standards for quality expected by their clients. It is not meant to be a prescriptive list of quality program components for a PC. Rather, the guide includes resources, tips, and tools that are available to help PC Quality Managers to achieve their quality goals. Most of the text sections are brief (usually one page), and many of the sections have attached examples or templates, or links to additional information. The guide can also serve as a useful reference to Program Quality Managers and PC Managers. The guide is updated annually by the Corporate Quality Manager.

6.1.4 PM Tools Page

WESTON provides easy access to valuable project management tools and resources on WESTON's PM Tools page, which has been developed as a one-stop location for all things related to project

management. Links to dozens of resources and tools are organized according to the project phase in which they are used: Client Selection, Positioning, Proposal Preparation, Project Planning, Project Execution, and Project Closeout.

For example, a PM searching for project planning tools and resources can click on the Project Planning tab to access information such as the following:

- Environmental Health and Safety Regulatory Impact Checklist
- Health and Safety Plan Template
- Job Opening/Procurement Planning Worksheet
- Project Execution Plan & Kick-off Meeting Template
- Project Files Index
- Project Incentive Plan Examples
- Project Opening Meeting Checklist
- Project Quality Pledge Guidance & Examples
- Project Risk Factors Worksheet
- Project Startup Tool
- Work-At-Risk Form

The PM Tools page also provides links to other sites containing information useful to PMs, and is maintained by the Corporate Quality Manager.

6.2 PERSONNEL

See Subsection 4.5.1 for a description of WESTON's Quality Network and Project Quality Representatives.

6.2.1 New Employee Integration

New Hire Integration Plans are used to help assimilate new employees into the WESTON culture and to help them quickly understand WESTON requirements, expectations, contacts, and resources. The integration plan includes the following:

- Sponsor who will serve as a go-to resource for the new employee, sponsor responsibilities, and schedule.
- Orientation activities to be performed by the new employee.
- Integration tasks to be performed by other individuals.
- Keys to success.

Plans typically cover the first 3 to 6 months of employment, and vary depending on the employment position.

Both new and existing employees can learn about WESTON's quality processes during a quality orientation session with the PC Quality Manager or other local representative. Quality orientation can be conducted one-on-one or with several new employees simultaneously. WESTON's Quality Orientation Presentation can be used to guide the discussion. This presentation is supplemented with information on the local quality committee and programs.

6.2.2 Training and Development

WESTON has long recognized that a constant and vigorous management and staff training program is critical for continued QMS success. Not only is training provided to project team members to ensure that technical and quality requirements are understood, an ongoing corporate training schedule is also maintained to strengthen the skills of employee-owners and to provide for career development. For projects, the PM and the respective Operations (Ops) Managers[1] assess the need for staff training and for qualifications of staff for specific processes before work starts. General training plans are included as part of ongoing personnel development and are addressed annually as an integral part of the individual performance review process.

As a professional services organization, WESTON's activities often require professionally registered staff (e.g., Professional Engineer, Professional Geologist) or technically certified staff (e.g., Certified Industrial Hygienist, Certified Safety Professional, Certified Tank Inspector, etc.). For government construction projects, CQC training obtained from the U.S. Army Corps of Engineers or the Navy is a prerequisite for the Project QC representatives. WESTON encourages and supports individual employee-owners in pursuing these goals and provides incentives to employee-owners who have achieved professional certification.

Realizing that professional competence is a cornerstone of a successful organization, WESTON designated resources for the creation of an online knowledge center called Weston Solutions University (WSU). This knowledge center is an intranet site providing access to training, resources, electronic bulletin boards, libraries, links, and expertise from peers and other professionals. WSU's Learning Management System tracks each employee-owner's completion of coursework and progress through his/her Individual Development Plan (IDP), and is available to the employee-owner and his/her supervisor.

Education and training records are maintained in Human Resources and/or within the WSU system.

Employee-owners are encouraged to participate in professional societies, continue their formal education, and continue to develop their professional skills. Preparation and presentation of technical papers is also encouraged. Recognition and incentives are provided for professional development activities.

Ops Managers are responsible for the professional development of their staff, and staff development is part of their performance goals. Ops Managers can expand employee-owners' knowledge and skill base through diversified project assignments. Additionally, WESTON offers a comprehensive tuition reimbursement program for employee-owners pursuing advanced degrees.

Additional position-specific training and development at WESTON is described in the following subsections.

[1] Various WESTON divisions and offices maintain the positions of operations managers, section managers, operating unit (OU) managers, and department managers, each of whom is responsible for line management of staff. For the sake of simplicity, references to any one of these job titles in this document can be construed to refer to all of them. Each of these positions typically reports to PC Managers.

6.2.2.1 Vanguard Leadership Development

Participation in WESTON's Vanguard leadership development program is extended to employee-owners recognized as having the potential to lead WESTON into the future, based upon their current performance. The Vanguard program provides these individuals with an opportunity to use what they learn to continually grow the WESTON organization. These leaders become responsible for creating a shared vision and living WESTON's values and mission.

The main purpose of the Vanguard leadership program is to enable high-performing and high-potential leaders through the WESTON Leadership Competencies, shown below:

1. Create a shared vision of the future for your team.
2. Develop loyal clients.
3. Motivate to achieve top performance.
4. Build teams to deliver results.
5. Strengthen individuals, your team, and WESTON.

Specific goals of the Vanguard leadership program are as follows:

1. Create greater self-awareness in each Vanguard participant.
2. Enable actions that carry forward and lead to realization of leader strengths, skills, and knowledge.
3. Identify and capitalize on the unique and significant leadership challenges and development opportunities for each Vanguard member.
4. Create a strong core of leaders to achieve WESTON's strategic and tactical business goals and take WESTON into the future.

The six-month Vanguard leadership development program creates opportunities of dialogue among peers and leaders. The average class size is 15 members.

6.2.2.2 Voyager Program

As an extension of the Vanguard leadership development program, WESTON developed a leadership training program called *Voyager*. WESTON managers who supervise or direct employees are the focus for the developmental process of their leadership strengths. Participants—or Voyagers—are nominated by senior managers and selected based on their past performance and future potential in a leadership role.

As leaders in WESTON, Voyagers will establish expectations of change, process, and behaviors of the people they lead. Developmental training, assessment, and process will be based on the three expectations of WESTON managers: Individual Contributor, Management, and Leadership.

The goal for this program is to increase Voyagers' capacity as front-line leaders—to transform their skills and knowledge through an understanding of their strengths. Voyagers will improve their leadership competencies, learn how to develop and enhance relationships with their staff, and positively influence their teams to enable them to excel in executing WESTON's mission and vision to meet its business goals, while also providing the Voyager with career development.

The *Voyager* program's curriculum is strength-based:

- Leadership competencies.
- Strengths awareness and commitment to serve: self, others, and team.
- High-quality connections.
- Leadership knowledge and skill development.
- Application of WESTON initiatives and their leadership opportunities.

Voyager is a 12-month program that requires approximately 90 hours of "dialogue" that enables growth through training, selected readings, assignments, and mentoring. Fifty employee-owners participate in each class, with a new class starting every 6 months.

6.2.2.3 Project Management Training

WESTON promotes development programs for key project positions such as PM. One aspect of this program is classroom training provided internally by WESTON trainers. This training consists of two full days of instruction and exercises to provide an understanding of the detailed management of a project from the receipt of a Request for Proposal (RFP) through project planning, execution, and closeout. It includes training in scope definition, project control, schedule development and management, cost/budget development and management, quality, resources/staffing, communications, and risk management and procurement.

In addition to classroom training, ongoing training and learning opportunities, such as online courses, CoPs, brown-bag seminars, and online access to best practices/lessons learned, are incorporated into the IDPs of PMs and continue throughout their careers. The CSG develops and delivers training specific to its needs. Individual PCs employ other development tools such as mentoring by experienced lead PMs and brown-bag seminars to help new or future PMs learn the tools of their trade.

PMs are trained in leadership, personnel management and development, quality management, client satisfaction, financial planning and management, and the administrative skills necessary for performance of their position responsibilities.

6.2.2.4 WESTON Business Masters

WESTON's goal is to become the most stable, agile firm in its industry. To achieve this vision and drive continued growth, WESTON leaders and managers must consistently make day-to-day business decisions using WESTON's business practices, concepts, knowledge, and skills. Both as managers and as employee-owners, WESTON leaders and managers are responsible for understanding and applying these practices across the company.

The WESTON Business Masters Program was developed to ensure that managers and decisionmakers understand the foundations of business management at WESTON necessary to make critical business decisions. The program's curriculum targets four focus areas—Leadership, Client Development, Operations Management, and Managing Teams—providing the practical, fundamental knowledge WESTON needs to more effectively manage its operations.

This intensive program represents a significant investment, both for participants and for WESTON. For 12 months, participants commit an hour a week to the program for coursework, beginning by reviewing the program curriculum and identifying areas to apply what is learned.

Embarking on and completing the Business Masters Program is generally self-driven, although cohort groups at similar career development stages often synchronize their progress through the program so they can meet to discuss the coursework and broaden their understanding of each topic. Course titles include Vision, Mission, and Values; Change Management; Building Teams; WESTON's Collaborative Organization; Business Ethics; and Facilitative Leadership.

6.3 BUSINESS TEAMS

WESTON has identified two types of business teams—Client Business Teams (CBTs) and Service Lines. CBTs shape the overall performance of all offerings within their client market segment. Service Lines ensure successful development, communication, and delivery of offerings for related services.

WESTONPortal hosts sites corresponding to each CBT and Service Line. These sites are populated with contact information, documents, and links to team Web pages. CoPs (see below) are often cultivated around a particular Service Line.

6.4 COMMUNITIES OF PRACTICE

A community of practice (CoP) consists of a group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. The members of a CoP share information, insight, and advice, helping each other solve problems. CoPs provide an excellent mechanism for sharing best practices and lessons learned.

CoPs are often aligned with a position type (e.g., PMs, PC Managers) or with technical area or service line (e.g., groundwater remediation, sustainability). Everyone at WESTON is encouraged to participate in one or more CoPs in topics of interest or value to them. Many of WESTON's CoPs maintain sites on WESTONPortal.

6.5 EMPLOYEE RECOGNITION

Recognition is a big part of WESTON culture. In fact, at WESTON, recognizing one another through acknowledgment and appreciation is *everyone's* responsibility.

PRAISE is the simplest, most profound method of recognizing and acknowledging WESTON employee-owners for their contributions:

Priority - Make a habit of frequently recognizing each others' contributions.
Required - The WESTON core values of *integrity*, *teamwork*, *making a difference*, and *exceptional quality* make recognizing others' contributions imperative.
Authentic - The best recognition is presented from the heart and to the heart in a timely, personal, and meaningful way.

Impact - Recognizing the value each achievement or idea has on accomplishing our operational and strategic goals is important.
Specific - Focus recognition on specific acts, accomplishments, or individual strengths so others can recognize and replicate success.
Easy - Recognizing each others' contributions should be simple, fun, and natural. Sleep, eat, exercise, and recognize!

Day-to-day recognition is what has shaped WESTON's recognition culture. Recognizing what matters most to WESTON on a day-to-day basis leads to true engagement. To determine the most appropriate way to recognize a fellow employee-owner, WESTON employs the philosophy, *"Praise Effort, Reward Results!"*

6.6 INFRASTRUCTURE

WESTON provides its employee-owners with the infrastructure necessary for meeting client requirements. This infrastructure includes permanent and temporary (field) buildings and utilities, appropriate workspace for each employee-owner, office equipment and the appropriate software packages, field equipment, transport, and modern communication devices. Employee-owners are given the tools and the work environment that enables them to achieve client quality requirements.

6.6.1 Computer Hardware and Software

WESTON's Information Services Department establishes standard WESTON computer hardware and software specifications and requirements. Specialized computer requirements for individual clients or projects are justified on technical and financial bases. Computer applications developed by WESTON and used to collect, manage, and/or disseminate data to support environmental operations or the design and operation of engineered systems are verified, validated, documented, controlled, and safeguarded. Computer software developed by WESTON employee-owners and subcontractors must provide evidence of QA.

WESTON utilizes several strategies to maintain high levels of system availability, including the following: redundancy of disk subsystems; real-time synchronous replication of WESTON's Project Control and Financial Accounting System directly to WESTON's hot site; system snapshots; nightly disk-to-disk-to-tape backups; storage of encrypted backup tapes off-site; use of server virtualization and management; and implementation of HP RecoverAll contracts on all critical servers.

6.6.2 Computer Hardware and Software Testing

WESTON tests new hardware and software thoroughly before deploying to the production environment. WESTON uses a three-tier patching process to ensure that all WESTON applications are thoroughly tested before deployment to all production servers and PC systems.

WESTON typically does not deploy new versions of major applications or operating systems until at least 6 months after their initial release, or the first patch/version update, to ensure that software is debugged and does not adversely impact operations.

WESTON's software intended for internal corporate use is developed using an Internal Life Cycle Development Methodology that was designed to validate the development process. The methodology consists of the following steps: requirements gathering, analysis and design, development, quality assurance and testing, and deployment and support/transition. Specific

milestones and project deliverables that serve as opportunities to validate system development mark each stage.

WESTON maintains programming standards to provide for consistency and code reuse. Three environments (i.e., development, test, and production) are used in software development to ensure proper control and verification. Proper review and signoffs are required to move development to the next stage. Associated documentation (i.e., programming code, project management documentation, testing plans, training materials, and life-cycle procedures) is monitored and controlled with software that has check-in/check-out and version control features, along with a site for each project using the team foundation server.

6.6.3 Prevention of Hardware and Software Obsolescence

WESTON typically depreciates its computer hardware on a 3- to 5-year basis. Personal computers are replaced every 3 to 4 years and servers are replaced every 5 years. Older systems that are still functional are generally relegated to less-critical functions and phased out. WESTON conducts a quarterly benchmark and configuration review and update for new personal-computer purchases. WESTON also keeps its personal computers current by selecting pricing points and buying the best technology for those pricing points. Using this methodology, the majority of WESTON's personal computer population is completely refreshed every 4 years with newer technology.

WESTON has purchased a Microsoft Enterprise Agreement to ensure that its desktop software is properly maintained and kept current. WESTON also upgrades its back-office systems (e.g., financial accounting and project control) at least once a year.

6.7 WORK ENVIRONMENT

WESTON provides a superior work environment for its employees, in large part due to its focus on health and safety and ergonomics, as described in the subsections that follow.

6.7.1 Health and Safety

WESTON's vision for safety is as follows:

> *"We will actively care for the well-being of ourselves, coworkers, families, clients, and subcontractors. We will be Safety Leaders. We will never compromise on safety—it is our first thought. We will enable a 'safety-first-and-all-the-time' culture wherever we live and work around the globe."*

Safety is one of WESTON's core values. WESTON employee-owners care for their coworkers, families, clients, and subcontractors, and focus on being safety leaders wherever they live and work. WESTON thrives in a "safety first and all-the-time" culture and accepts personal responsibility for creating a safe environment. To achieve this level of safety requires that WESTON continually look for ways to improve its safety program.

WESTON's Environmental Health and Safety (EHS) Program incorporates principles of an integrated safety management system (ISMS). Under an ISMS, all accidents are preventable through close attention to work design detail, careful hazards assessment and control, and by focused attention to safe work practices. WESTON's ISMS is an integral part of the WESTON management philosophy and is the foundation for its commitment to safe performance during the execution of all contracts

and projects. The ISMS is a dynamic system that supports worker, public, and environmental safety and close integration with subcontractors.

WESTON's EHS program encompasses quality, environmental preservation, health, and safety to execute projects without harm to persons, property, or the environment. WESTON encourages the Plan, Do, Check, Act (PDCA) model for project planning and implementation as standard work practice for every job. The four elements of the PDCA model are shown below:

- Plan: Plan ahead, analyze, and predict results.
- Do: Execute the plan, taking small steps in a controlled environment.
- Check: Review the results, compare against the plan.
- Act: Take action to maintain or improve.

WESTON's comprehensive behavior-based safety (BBS) program allows WESTON to maintain rates for reportable and lost-time accidents well below the average for its industry. As part of BBS, WESTON employee-owners accept and understand that 100% safe work is an achievable goal.

To keep each other safe, WESTON employee-owners pledge the following:

- We depend on each other, and care about ourselves, our families, coworkers, and clients.
- Our projects are safe—we meet and exceed compliance requirements.
- We comply with the Health and Safety Plan, Accident Prevention Plan, and Environmental Compliance Plan for each field project—they guide our actions.
- We stop any work that presents an imminent hazard to people or the environment or is not adequately addressed in the Health and Safety Plan, Accident Prevention Plan, or Environmental Compliance Plan.
- We manage changing conditions to address safety implications—no surprises!
- We identify unsafe working conditions and know how to get them corrected.
- We accept coaching and provide assistance to others to encourage safe work behaviors.
- We work to develop strong connections with our project team, to foster an actively caring environment.
- We feel empowered and confident in the decisions we make to ensure safety for ourselves and those around us.

6.7.2 Ergonomics

Because of WESTON's commitment to providing a safe work environment for all of its employee-owners, WESTON has implemented a proactive Ergonomic Program to ensure that each workstation provides an ergonomically correct setup. To enhance this program, WESTON has added an Interactive Ergonomic Program that is used to guide the setup of each workstation to minimize the potential for discomfort. This program contains guidance on the basics of ergonomics, performing monitor evaluations, and setting up workstations to minimize specific discomfort. The program also contains ergonomic exercises that each employee-owner can perform while at his or her desk.

SECTION 7: PROJECT REALIZATION

7.1 PLANNING OF PROJECT REALIZATION: THE PROJECT LIFECYCLE PROCESS

WESTON has developed and implemented a Project Lifecycle (PLC) process that divides the lifecycle into six project phases, with guidelines and tools to create a common approach for planning, tracking, and making key decisions. The intent of the PLC is as follows:

- Develop a single, unified approach to selecting, planning, and executing opportunities and projects.
- Establish defined accountabilities and responsibilities for each step of a project.
- Focus attention on the most critical project decisions.
- Improve execution in the most critical areas.

The PLC creates a common approach for how WESTON manages opportunities and projects from Client Selection to Closeout across the company, creating the backbone for how WESTON conducts its business. The approach is designed to minimize bureaucratic "fill-in-the-box" tasks, allowing WESTON to focus its energy on making informed project decisions. While mandatory for major corporate-approved opportunities, the same thinking is applied to smaller opportunities and projects, scaling down the level of effort and documentation required.

A management review (Progress Check) is performed for each of the six phases. One person is held accountable for the overall progress of each phase. The Progress Check is facilitated by use of Progress Check Scorecards that identify 13 key decisions that must be made at all phases of the lifecycle. One person is assigned to and accountable for each key decision.

The Progress Check Scorecards help WESTON determine whether the project is on track, where to focus efforts, and whether the team is ready for the next phase. The Scorecards, used for all opportunities and projects at the PC Manager authority level and above, clarify accountability and responsibility and help eliminate barriers to progress. They let managers and project teams monitor progress, identify problems, brainstorm solutions, and identify resources. They are not "report cards," but are meant instead to guide project teams through key project checkpoints, facilitating decisions rather than simply supplying information.

Many individuals play an important role in the PLC process:

- The Phase Owner (usually the PM during the project phases) manages the process, sets the tone for Progress Check meetings, leads the team in collaborative decisionmaking, and is responsible for personnel resource selection, commitment, and engagement throughout the entire process.
- The Decision Owner (also usually the PM during the project phases) makes scorecard decisions, rating each item "on track," "at-risk," or "off track," based on his/her involvement with the project.

- The Approver is the individual at the approval authority level that gives ultimate direction to the process and, based on his/her experience, offers insights and identifies issues that other team members may not be aware of.

7.2 CUSTOMER-RELATED PROCESSES

7.2.1 EngageTrack

WESTON recognizes and tracks "highly engaged" clients—those clients who see WESTON as a preferred partner and trusted advisor that is critical to their success. To increase visibility and focus on this effort, WESTON has developed and implemented a system called EngageTrack. This system tracks Client Engagement for Key Clients to ensure that WESTON develops a clear understanding of how its Key Clients perceive its performance and to drive actions for continuous improvement.

The objectives of using EngageTrack are as follows:

1. Focus attention and dialogue on Client issues to ensure that Client engagement becomes part of WESTON management reviews and company culture.
2. Avoid being blindsided by unknown Client concerns, while rallying support earlier to address concerns before they become major.
3. Increase dialogue between Client relationship owners, CSMs, PC Managers, PMs, and business team leaders so that everyone on the team gets the support needed.
4. Increase the number of highly engaged Client partnerships.

Key Features of WESTON's Client Engagement Program

1. WESTON's focus is on the top 150 to 200 Key Clients that make up most of its revenue. Division Managers are responsible for ensuring that this Key Client list is current and complete.
2. Each Key Client is assigned an "owner" who is responsible for maintaining a monthly assessment of overall client engagement, determining whether the client is Highly Engaged (Blue), Above Average (Green), Average (Yellow), or Disengaged (Red). In creating this assessment, the owner also evaluates whether the project team is "On Target," "At Risk," or "Off Target" for three other factors—WESTON's relationship with the client, project performance, and account plan progress. Anyone may comment on these assessments or the actions the project team needs to take, but an assigned "Verifier" comments to ensure that the project team is afforded more than one perspective.
3. Owners receive an e-mail reminder each month requesting assessments by a specified date, directing the owner to their "My Assessments" page on EngageTrack.
4. Owners contact relevant team members for input before completing their assessment. For example, an owner may need to contact the lead CSM to discuss progress on the account plan and several project managers to discuss project performance. CBT leaders will also periodically gain insight through their own client contacts.
5. WESTON uses information from various sources to assess client engagement. Face-to-face or phone conversations with a variety of client contacts at different levels and functions are

most effective. WESTON's e-mail-based Client Satisfaction Survey may also be useful in understanding the company's performance perceptions for specific projects.

6. EngageTrack allows users to view reports summarizing assessments for the current and prior month by division, PC, and business team.

7.2.2 Projects

WESTON delivers value to its clients almost exclusively by way of projects, which are defined as "temporary endeavors undertaken to create a unique product, service, or result." (*A Guide to the Project Management Body of Knowledge*, Third Edition, Project Management Institute, 2004). Therefore, projects are ultimately WESTON's primary customer-related process.

Project management is defined as "the application of knowledge, skill, tools, and techniques to project activities to meet project requirements." Recognizing the paramount importance of project management, WESTON spends considerable effort in developing and supporting effective project managers, who are ultimately responsible for project success. WESTON's project management training is described in Subsection 5.2.2.3.

Key components of projects include the following:

- Proposal development/scoping
- Project planning
- Procurement
- Execution
- Closeout

These components are described in the following sections.

7.3 DESIGN AND DEVELOPMENT

7.3.1 Proposals

WESTON is typically awarded projects based on proposals, in which it conveys its understanding of and plan for addressing prospective client needs. Project quality starts at the proposal-planning stage. An effective and comprehensive proposal is critical to the success of the project.

WESTON's *Technical Publications Manual* (TPM) (OP-09-09-003) describes the roles of various proposal team members, and includes an editing checklist for proposals. Other helpful tools and resources are available on the Proposal Development site on WESTONPortal.

A conflict-of-interest check must be completed for each project opportunity for a new client or new site location. To perform the check, the PM or CSM completes and submits WESTON's Conflict of Interest Form.

Proposal signature authority depends on the complexity, risk, contract terms, and value of the opportunity. WESTON's Approval Authority Operating Practice (OP) outlines the signature authority for various contract terms and sizes.

7.3.2 Project Planning

On the program/project level, plans and procedures based on client requirements and on WESTON's QMS are prepared. These plans and procedures guide the work during project execution.

WESTON assesses project performance using project-specific documents and metrics as a reference for compliance and achievement of client objectives.

Following the project scoping activity, a Project Plan (also called Work Plan or Project Instructions) is developed to assist in the understanding and documentation of project scope, objectives, and plan for execution. A Project Plan assembles the output of project planning into a consistent, cohesive document that can be used to document planning assumptions and decisions, guide project execution and control, manage risks, and facilitate communication among the stakeholders. The Project Plan is the game plan for successful execution of the project. All elements are documented so the comprehensive approach can be reviewed and approved and then utilized by the project team. The Project Plan may be completed by the PM or a designee and discussed during the project kick-off meeting and updated as necessary.

In some cases, the format of the project plan is dictated by the client. If not, WESTON project teams develop a project plan using WESTON's Project Plan form or a narrative form. The PM or other personnel completing the Project Plan reviews each component outlined in the form and use professional judgment in determining what should be part of the Project Plan, while remaining compliant with WESTON guidelines.

The Project Plan is treated as a living document, with updates made as conditions change or new personnel are assigned. Attachments are used as appropriate to supplement the basic information provided in the form.

7.4 PROCUREMENT

WESTON purchases materials and services from vendors/subcontractors as an integral part of executing projects on behalf of its clients. It is essential that the quality of these materials and services meet or exceed the quality objectives established for their intended use.

WESTON typically purchases consumable materials, supplies, and support equipment using purchase orders; and services using subcontract, laboratory, consulting, or transport and disposal agreements. Off-the-shelf, commercially available materials in the marketplace may be purchased using a WESTON purchasing card (P-card) if the total value of a transaction is less than $2,500. Examples of services typically required to support the execution of projects include laboratory/analytical services, consulting/technical services, and various construction services such as civil/electrical/mechanical contracts, well drilling, landscaping, and transport and disposal of waste.

WESTON's *Procurement Procedures Manual* describes the roles and responsibilities of the project team and procurement representative in executing procurement transactions. Use of procedures outlined in this QMM ensures that material, equipment, and services purchased from vendors or subcontractors conform to the project requirements, including the client's contract provisions. These procedures provide processes and approaches for the following:

- Conducting source evaluation and selection.
- Completing cost/price analysis and making price reasonableness determinations.
- Establishing and measuring objective evidence of quality furnished by selected vendors or subcontractors with respect to their intended use.

- Conducting inspections at the vendor or subcontractor source.
- Inspecting products upon delivery and reporting defects related thereto.

For projects, the PM is responsible for ensuring that all procurements are processed in accordance with WESTON's *Procurement Procedures Manual* and accompanying documents. For internal support organizations, the OU Manager is responsible for ensuring that procurements occur in accordance with the *Procurement Procedures Manual.*

When components or services are subcontracted, WESTON retains responsibility for the successful completion of the overall project. Potential subcontractors must demonstrate the ability to successfully perform the proposed statement of work, must possess the financial capability and capacity to perform, and must exhibit a "proven" track record for safety in the field. WESTON evaluates the capabilities and capacity of subcontractors to provide required services and deliverables that comply with project quality requirements. At intervals consistent with the complexity and required quality of the services or deliverables, the PM is responsible for assessing how effectively subcontractors control quality so that any areas requiring corrective actions can be identified and improved. The mechanism for providing such feedback is the subcontractor evaluation process and is described in Procedure 3.27 of the *Procurement Procedures Manual*.

The *Procurement Procedures Manual* and the accompanying documents, *Desktop Instructions/Tools – Federal Procurement* and *Non-Federal Purchasing Guides,* describe the sequence of actions to be performed in the preparation, review, approval, and control of procurement documents. This process incorporates the necessary checks and balances among the Requestor, Approver, and Procurement Representative to ensure procurement transactions are accurate, complete, and clearly describe the item or service acquired; the associated technical and quality requirements are included; the quality system elements for which the supplier is responsible are included; and the verification procedures to ensure compliance of the item with Requestor's requirements are in place and client satisfaction is achieved.

WESTON's *Approval Authority Procedure for Contracts, Proposals, Authorizations, Commitments and Other Documents* OP (OP #04-03-001) must be consulted to ensure that only personnel with appropriate authority approve the authorizing documents (requisitions) and make commitments (purchase orders or subcontract agreements) on behalf of the company.

7.4.1 Procurement Enabling Tools

Online tools have been developed to make the procurement process more efficient and to reduce potential risks.

Procurement Planning Tool

WESTON's Procurement Planning Tool (PPT) is a wizard-type tool designed to enable PMs to perform the following:

- Evaluate the risk level of the purchase.
- Identify applicable documents to be included in any RFP.
- Provide guidance on the content of applicable documents.
- Identify resources to aid in completion of the procurement process.
- Prepare a requisition to authorize the initiation of the procurement process.

The PPT allows evaluation of risk associated with services/supplies to be purchased irrespective of subcontractor/supplier selection. PPT is formatted as a simple question-and-answer tool that designates, based on user responses, whether a procurement is a "Major Subcontract" that represents higher risk, and provides guidance and access to the forms and resources required to prepare the bidding documents. If a "Major Subcontract" designation is assigned, the project requires that Procurement personnel prepare a risk assessment.

The PPT is used for any procurement exceeding $25,000 in value, and should be used in the proposal stage to the extent possible, and whenever preparing a project proposal or executing procurements under a client task order or contract.

SubTrack

SubTrack is WESTON's searchable database of prequalified suppliers and subcontractors from which due diligence information has been obtained, evaluated, and scored. SubTrack includes a subcontractor performance evaluation module to capture feedback on subcontractors' and suppliers' project-specific performance, which enables sharing of performance feedback throughout the company.

Procurement risks can be reduced by using this tool to select prequalified vendors who have favorable ratings in the SubTrack database. Currently, almost 1,500 subcontractors and vendors have been prequalified in SubTrack, and more are added each week. Project and procurement personnel are responsible for providing input on subcontractor/vendor performance to keep the tool relevant, effective, and up to date.

A SubTrack tutorial is available to help first-time users understand the features and capabilities of SubTrack.

7.4.2 Procurement Quality Control

7.4.2.1 Identification and Control of Materials, Parts, and Components

WESTON provides for formal control over and identification of raw materials and purchased fabricated parts and components to be used in construction or other operations. WESTON has established measures for identifying and controlling materials, parts, and components in its OP 10-01-004, *Identification, Review and Control of Deliverable Documents, Samples, Materials, Parts, Components, and Deliverables*. The measures described in OP 10-01-004 ensure that, where appropriate, the item is identified by part number, serial number, identification number, or other suitable means, either on the item or on records traceable to the item as required throughout fabrication, construction, installation, and use of the item. These identification and control measures are designed to prevent the use of incorrect or defective materials, parts, and components, and to ensure the use of only acceptable materials, parts, and components.

7.4.2.2 Verification of Purchased Product

Inspection and acceptance testing is performed to verify that services or deliverables meet requirements. For procured services or products, the *Procurement Procedures Manual* noted above outlines the activities conducted to verify the adequacy of procured services and products. For projects, the Project Plan outlines the actions to be taken by the project team members to ensure that appropriate verification activities are performed.

Evidence that purchased materials, equipment, and services have been inspected and conform to the procurement requirements is to be generated and available at the work site, when specified in the Project Plan, before any such materials, equipment, or services are installed or accepted. This documentary evidence shall be retained and must be sufficiently detailed to identify the specific requirements imposed on the procured materials, equipment, or services.

7.5 PRODUCTION AND SERVICE PROVISIONS

Work processes are conducted in accordance with planning documents to provide services and deliverables that meet or exceed client requirements and expectations. Implementation begins with communication of the requirements, roles, responsibilities, and authorities of management and staff through project kick-off meetings. As the project proceeds, project status reviews, client coordination, procedure reviews, supervision of work performed, inspections and testing, project documentation, and project closeout will ensure that the work performed meets the client requirements and that client satisfaction is enhanced.

7.5.1 Project Opening

The CSM, PM, project team members, and client must have a thorough and mutual understanding of the client objectives, project scope, project plan, budget, and schedule prior to starting a project. Therefore, both an internal and an external project kick-off meeting are held at the start of each project. The external project kick-off meeting includes key WESTON project team members, the client team, and, in some cases, other stakeholders such as regulatory agencies. The Project Plan form can be used to assemble the Project Plan data (see Subsection 6.3) for distribution to the internal and external project kick-off meeting attendees.

The Project Plan form can also be used to establish the project kick-off meeting agenda. The project kick-off meeting date, attendees, topics discussed, and other pertinent information are documented and placed into the project file. The PM must clearly communicate the budget to the project staff, including the basis for the budget and key assumptions.

Project financial information is tracked using Costpoint®. To open a project in Costpoint, the PM or Project Analyst must enter client information, budgets, invoicing information, project type (e.g., fixed price, cost plus fee, time and materials, etc.), and other project information. The project should be rebudgeted (prior to entering budget into Costpoint) if the budget changed during negotiations with the client, or if labor, subcontractor costs, or expenses are anticipated to change. Proper project setup is imperative because setup errors can make project tracking difficult, and making corrections retroactively can be expensive and time-consuming.

7.5.2 Client Coordination and Communication

Client coordination and communication are essential components of a successful quality system. Regular coordination with the client is necessary to inform the client of project status and results, to obtain client input, and to provide for informed and timely client decisionmaking during the project. Communication records should be maintained in the project files, with updates to EngageTrack.

An appropriate frequency for client-WESTON meetings must be established during the definition of project scope. In many cases, it will be necessary to mutually agree on the number of meetings and level of contact warranted. The number and frequency of meetings will depend upon the type of project, degree of client participation, decisionmaking involved, type of client, and other factors.

This is often determined at the proposal/contract stage so the project can be correctly budgeted. Client project status meetings and coordination details should be defined in the Project Plan prior to, and reviewed during, the project kick-off meeting.

7.5.3 Project Tracking

The PM, with help from Technical Managers, is responsible for tracking project progress. WESTON has developed many quality management tools to facilitate effective project tracking, as described below.

Of particular importance is the tracking of earned value, which is used by the PM to assess whether the project is on track. Specifically,

Earned Value = Portion of the budget equal to the percentage of the work completed

If the earned value is equal to the actual costs incurred, then the project is on track. If the cost variance (actual cost – earned value) is positive, the project budget is being expended faster than anticipated and corrective action is warranted.

PMs are responsible for preparing accurate estimates to complete the project, which are then reflected on revenue authorization summary (RAS) worksheets monthly. A complete RAS worksheet includes the signature of the PM, verifying that the earned value and estimate at completion are as accurate as possible.

Other best practices for PMs to track and manage project financials are listed below:

- Review Costpoint (WESTON's financial tracking system) project details weekly to track project expenditures and to verify that the charges are appropriate.
- On larger, more complex projects, use a software tool such as CostTrack (discussed below) to provide a more detailed breakdown of project costs and commitments. Using this tool, break out future expected costs for labor, internal expenses, external expenses, and subcontractors.
- Check status of purchase orders (PO) at least twice a month, using PO by Project and PO Info links on CorpTrack, to track subcontractor and vendor payments and outstanding commitments. When subcontractors/vendors are to be paid on a time-and-materials basis and the quantities are not defined, require subcontractors to report their costs/quantities weekly. In the event of significant travel and P-card purchases, ExpenseTrack report functions should be used to check expenses to date and determine whether expense reporting is falling behind.
- Confirm the amount of remaining effort with technical staff and subcontractors and correlate it to the remaining budget (i.e., determine the current earned value). Perform this exercise at least twice a month on large projects, and use the results in developing the monthly estimate to complete, or ETC, summary.
- Communicate the status of the remaining budget with the active project staff at least biweekly. Include the calculation/estimate of percent budget spent versus percent scope completed.
- Remind staff to submit expense reports within 1 week of expenditure.

- If PM includes an anticipated or received change order in the budget to cover additional project costs, he/she must have the concurrence of the CSM. If the change order has been approved, include the date for receipt of change-order approval from client, and copy of approved change order with the RAS worksheet.
- If an unrecoverable budget overrun is anticipated, discuss overrun mitigation measures with the OU Manager, CSM, CBT, and/or other manager as appropriate.

To help with tracking earned value, WESTON has developed a tool called CostTrack, a major cost controls application with both an online and offline component. CostTrack allows more-reliable tracking of project costs by using real-time data loaded digitally in the field. CostTrack is especially useful for construction and other large-scale field efforts in which significant project expenditures may occur over a short period and in which subcontractor costs represent a large portion of project costs. Since these costs may not appear in Costpoint until weeks after they are incurred, a system like CostTrack that allows a daily snapshot of project status serves as an invaluable risk management tool.

Additional project management tools are maintained and updated on WESTON's PM Tools page.

7.5.4 Project Documentation

The PM is responsible for establishing document control and project filing systems and for providing and maintaining complete, current project files. Project documentation includes paper and electronic files, calculation books, reports, letters, memoranda, etc., as a representation of key assumptions, internal and external communications, calculations, decisions, and results.

Document control addresses control of the creation, review, revision, approval, distribution, storage, and archival of records pursuant to the conduct of WESTON activities. Project files should be complete, orderly, and organized logically, to facilitate efficient retrieval, using WESTON's Project Filing Index.

7.5.4.1 Control System

Document control may be formal or informal depending upon the complexity of the project and client requirements. Requirements and procedures for document control should be discussed during the project kick-off meeting.

Formal document control implies a detailed system of generating and tracking documents through the centralized assignment of document control numbers. Document control may be applied to incoming communications from the client as well as WESTON deliverable submissions. It may also be applied to review comments submitted by internal reviewers, the client, or, in some cases, the public or other affected parties. In many cases where the client requires a formal document control system, the client also provides the criteria and the format. Client format and procedures are to be followed unless they are contrary to statutory or professional requirements. Document control systems are established on a project- or program-specific basis.

Informal document control implies adherence to the normal WESTON document management process. Internal and external document distribution and review lists are prepared as part of the project plan, and/or discussed and documented as part of the Project Kick-off Meeting. Client review comments, which may be in either hard copy or electronic (i.e., e-mail or a computer file) form, are to be maintained in the project file. The PM and the document author are responsible for

integration of client comments in documentation. Deliverable documents are maintained and filed in accordance with the WESTON Project Filing Index.

Procedures for control of project deliverables are addressed in OP 10-01-004. Procedures for control of design-construction documents are detailed in the Engineering Design Quality Assurance Management Plan, both of which are available on WESTONPortal.

Although the details of document control procedures may depend on client specifications, the basic premises of WESTON's document control ensure the following:

- All documents are reviewed, approved, and updated as necessary and re-approved prior to use.
- All changes and current revisions are identified.
- Applicable documents are available to the user.
- All documents are legible and identifiable.
- Document distribution is controlled.
- Obsolete documents are identified and taken out of use.

Insofar as is feasible, recorded information is created using standardized electronic media and software. The use of centralized computer files allows efficient retrieval, review, revision, and approval of recorded information. These activities are performed using personal computers with Local Area Network (LAN) or Wide Area Network (WAN) connections through centralized servers. Each WESTON office regularly backs up its LAN and stores the backup media for a minimum of 3 years. Standardized directory formats are used for the storage of all client and WESTON administrative files.

7.5.4.2 Records Management

Records are composed of any informational medium, regardless of physical form or characteristic, that was created or received by WESTON in the course of transacting its business, is related to its legal obligations, and is appropriate for preservation (from OP 04-17-001, Records Management Procedures). Records management is the planned and systematic control of business records from their creation through their final disposition. It addresses the procedures for identifying, creating, maintaining, storing, purging, retrieving, and disposing of the company's records. Not all recorded information is a record. Such nonrecord examples include library and reference materials, extra copies of documents, technical reference materials, and personal papers.

Procedures outlined in OP 04-017-001, Records Management Procedures, address records classification, the creation and maintenance of records, storage and retrieval of records, record retention schedule, and the destruction of records.

7.5.4.3 Project Files

The PM identifies files to be maintained and establishes the file format before work starts. At the completion of the project, files are identified that are to be retained as records. The PM archives the records for retention in accordance with the retention periods specified in OP 04-017-001, Records Management Procedures. Contractual terms requiring longer or more-comprehensive records retention supersede normal WESTON practice.

Project teams are encouraged to store electronic project files on project SharePoint sites rather than on hard drives. If hard drives are used for file storage, backup copies of the files should be maintained.

All electronic files are stored in WESTON's LAN/WAN environment and are maintained, backed up, and archived by the WESTON Information Services Department. Active file maintenance, archival, and records destruction periods are determined depending upon the type of information and client and legal requirements. Electronic (digital) records are stored for a minimum of 3 years.

7.5.5 Document Deliverable Quality Control

In order to deliver "Exceptional Quality—Every Time," WESTON deliverables need to be reviewed by qualified coworkers before they are submitted to clients. Deliverables may include reports, plans, proposals, letters, spreadsheets, cost estimates, software, and data tables. The quality of WESTON's physical deliverables such as structures, earthwork, etc., is maintained using the three-phase quality approach described in Subsection 6.5.6.

It is essential that WESTON documents, both proposals and project deliverables, prepared and submitted to clients undergo a QC review prior to release. WESTON's performance is often judged by the quality of the documents that it prepares because these are the evidence of WESTON's work for its clients. The QC review applies to all draft and final documents that are prepared and transmitted either in hard copy or electronically.

The steps in producing a WESTON document are detailed in Figure 2-1 of WESTON's *Technical Publications Manual* (TPM). Section 2 of the TPM also spells out the responsibilities of individuals involved in the production of WESTON documents, including the author, editor, proposal administrator, and word processor.

The individual authorized to approve the project plan is responsible for determining the need for and adequacy of these reviews.

The QC process involves the steps described below.

7.5.5.1 Initial Document Planning

Sufficient time and project funds must be allotted when the project is opened to provide for a meaningful and complete review of the client deliverables. Prior to drafting the initial documents, the lead author and PM should review the QC requirements contained in the Quality Control Checklist for Authors and Reviewers, which is linked to the Deliverables Review Sheet. This checklist will be used to guide the document review process.

Important: The WESTON TPM should be used when no client-specific format or requirements are specified.

7.5.5.2 Preparation of the Review Copy

The lead author and/or PM should provide the initial QC review for each document prior to submitting the documents for the final QC review. The lead author and/or PM should read the document, run spelling and grammar checks, check math in all calculations, check the scale on drawings, and ensure that all relevant elements are included so that each document can be reviewed effectively. It is distracting for reviewers to review documents that contain typographical errors, and inefficient for them to review incomplete documents.

7.5.5.3 Basic Review Elements

Basic review elements for each document include an evaluation of meeting client expectations; checking consistency and logic; reviewing tables, data, figures, calculations, appendices, and attachments; and checking document format.

Meeting Client Expectations

Client expectations define quality for each project. Each deliverable should be reviewed in light of client expectations as expressed in the Project Quality Pledge, contract, proposal, or other communications with the client.

Consistency and Logic

A deliverable document is produced to support a client position, provide the client with information, recommend a specific course of action, or report the results of actions taken. The deliverable document must be organized in a fashion that clearly and concisely provides the information. If the document is large enough, an executive summary should be provided that summarizes the main points and highlights findings.

Table Review and Data Check

Tables should be used to summarize or compare data rather than relying on extensive discussion. The table should be referenced in the text, and a few specific and important highlights identified. Table call-outs in the text should be compared to the table information for consistency. All tables must be reviewed against the raw data to ensure that there are no typographical or formula errors. Whenever possible, electronic data deliverables should be required and used to minimize data errors in tables. Any calculations, as well as table format (grid lines, title format, etc.) must be checked. Once the table is proofed, evidence of review, including identification of reviewer and date(s) reviewed, should be documented for the project file. For example, check prints could be generated or the following notation could be added below the table as a note: “Table proofed by (reviewer’s initials) on (date of review).”

If analytical data are validated, the author should note this important distinction by adding the following additional notation below the table: “Analytical data have been validated, data checked by (reviewer’s initials) on (date of review).”

Figure Review

All figures must be reviewed for accuracy and consistency (consistent format for drawings; correct drawing feature labels; consistent site names in labels; accurate, comprehensive, and consistent legends; analytical results in text boxes on figures match data table). Figures should be called out in the text, and call-outs should be reviewed for consistency with figure information. Figure sign-offs should also be accurately completed on the design drawings (Designed by, Drawn by, Checked by, Approved by). Figures that are developed from data tables must be reviewed with the data tables to ensure that the information is represented accurately.

Calculation Review

Reviewers of calculations must check not only the results of the calculation but also method and input sources. Having the right answer is irrelevant if the wrong method was used. All calculations, whether in the text or appendices, must be proofed for accuracy. This is especially true when

formulae are used in spreadsheets. WESTON “quad pad” tablets are a preferred format for calculation checks and sign-off.

Appendix and Attachment Review

Appendices and attachments support information provided in the main body of the document or provide backup information needed as evidence of an event. All appendices must be reviewed for completeness (for example, all well logs are included as cited in the report) and to ensure that the latest version is used.

Format Review

The final text format must be reviewed prior to release. Note that even a technically superior document can be damaging to WESTON if formatting problems persist. Elements such as internal consistency of section, table, figure, and appendix references, table of contents (format and page numbers), headers and footers (format, font size, pagination, etc.), section title (format and font), spelling, grammar, references, and acronym definitions must be reviewed.

7.5.5.4 Draft Review

Documents are not submitted to a client without appropriate review. “Draft” documents imply incomplete client review or acceptance, not incomplete WESTON technical or managerial review and approval.

The text and supporting elements (tables, figures, appendices, etc.) must be reviewed for technical accuracy, completeness, internal agreement, and format. The PM or lead author should attach the Deliverables Review Sheet and submit the elements of the draft document to the reviewer(s).

Initial/Peer Reviews

The first review involves a technical and format review of the document text, tables, figures, appendices, and other supporting documentation. This review can often be performed by a peer. Reviewers should not accept review documents without a Quality Control Checklist for Authors and Reviewers. If substantive modifications to the document are required, the reviewer should request to see the corrected document before it is sent for final review.

Senior Technical Review

A senior technical review is conducted to ensure that the presentation, interpretations, conclusions, and recommendations are technically sound. The technical review should be performed by a senior discipline expert (chemist, engineer, geologist, etc.). The review copy (copies) should include the complete text with all relevant attachments, tables, and figures to support the text and should have incorporated any revisions, comments, or corrections identified in the initial/peer review. A technical review of a specific report component may necessarily require review of an additional portion or all of the remaining document to allow optimal technical review.

Technical Edit

The technical edit may include editing of text, graphics, and tabulated data with respect to clarity, spelling, grammar, punctuation, format, and consistency; reviews for consistency of figure, table, appendix, and attachment references; verification of acronym definitions in text, tables, and figures and consistency with acronym list; a review for consistency of information provided in text with

corresponding table and figure information; and a review for consistency of symbols, units of measure, and format. Ideally, the technical edit is performed by a technical editor, but may be performed by a reviewer who has technical writing and document production experience and good spelling and grammar skills. Proof of completion of technical editing may be documented on the first page of the Quality Control Checklist for Authors and Reviewers.

Professional Engineer or Other Required Reviews

In many projects, a review by a Professional Engineer (PE), a Professional Geologist (PG), or other professional licensed in the state of the project location is required. These "licensed" individuals usually must have direct involvement or oversight of the project in all phases of the project, from scoping through deliverable reviews.

Checklists and other guidance for performing engineering reviews are provided in WESTON's *Engineering Design Quality Management Plan* referenced in Section 8. The stated purpose of this plan is "to provide quality deliverables aligned with client needs and project requirements."

Revised Reports

When a report is returned to WESTON from a client with comments or other request for revision, the PM must assess the scope of the changes and the requirements for review prior to completing the revised document. A revision in one section, table, figure, or attachment may create a domino effect of changes throughout a document. The impact of the revision should be carefully considered and planned to ensure that appropriate revisions are made throughout the document.

Final Deliverable

The PM should perform a final check of the deliverable after all of the parts have been assembled. The purpose of this review is to ensure that the document is assembled correctly and that current versions of attachments, appendices, tables, and figures are used. Additionally, the PM should inspect the cover, table of contents, and tabs. Table 2-1 in WESTON's TPM provides an editing checklist for reports and proposals.

Other Review Documents

The PM is ultimately responsible for the submittal of top-quality documents to WESTON clients. Personal preferences of each PM will likely result in some variations to the general procedures described herein, especially the order of the various review elements. In some cases, individual clients or programs have specific additional QC checks or procedures that must be used. Prior to document submittal to the client, the PM will ensure that any additional reviews are completed and documented on the Deliverables Review Sheet, which should be kept with the deliverable to document that the reviews were completed.

7.5.6 Physical Deliverable Quality Control

The QC procedures for field work are based on the following three-phase protocol:

- Preparatory
- Initial
- Follow-up

Each QC phase is discussed separately in the following subsections. Checklists for inspections during each of these phases are provided in the *Construction Support Group Quality Management Manual* referenced in Section 8.

7.5.6.1 Preparatory Phase

A preparatory meeting will be conducted prior to beginning any work on a definable feature of work. The preparatory inspection and meeting will include, as applicable, the following:

- A review of the appropriate activity hazard analysis to ensure that safety requirements are met. Safety is number one!
- A review of each paragraph of applicable specifications or variances identified by WESTON to the client.
- A review of the contract/project plans and scope of work.
- A check to ensure that materials and/or equipment have been approved, and if required, have been tested and calibrated.
- A check to ensure that provisions have been made to provide required QC inspection and testing.
- Review and understand the applicability of the Project Quality Pledge.
- Review client expectations and special needs.
- Review WESTON expectations.
- Review quality process and procedures.
- If a construction project, review the Construction Quality Analysis to ensure that construction requirements are met.
- If construction project, review the technical summaries of the Construction Specifications Institute (CSI) divisions as denoted on the Construction Quality Analysis. These technical summaries are included in the CSG toolbox on WESTONPortal.
- Examination of the work area to ensure that required preliminary work has been completed and is in compliance with the contract.
- A physical examination of required materials, equipment, and sample of work to ensure that they are on-hand, conform to approved shop drawings or submitted data, and are properly stored.
- Review of personnel qualifications to include current certifications (e.g., inspections, welding qualifications, etc.) as required.
- Discussion of procedures for constructing the work.
- Project documentation of the tolerances and workmanship standards for the phase of work being inspected.
- A check to ensure that the client has accepted the portion of the Construction Quality Plan for the work to be performed.

- Review testing requirements.
- Review schedule.
- Review reporting requirements.
- Discuss as-built drawing development.
- Distribute meeting minutes.

The WESTON PM, site manager, or other designee will coordinate with the client to ensure that the preparatory-phase activities meet client/contract requirements and the established schedule is met and updated. The preparatory actions should be shown in the schedule provided to the client.

A meeting should be conducted by the Project QC Lead and attended by appropriate QC personnel and the work leader responsible for the definable feature of work. The results of the preparatory-phase inspection (e.g., discussion of acceptable workmanship, actions required, etc.) should be documented on the inspection form or by separate minutes prepared by the Project QC Lead and attached to the Daily QC and Production Report.

Additional preparatory phases may be conducted on the same definable features of work as determined by the client if the quality of ongoing work is unacceptable; or in the event of changes in the applicable QC personnel or in the on-site production supervision or work crew; or if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

7.5.6.2Initial Phase

An initial inspection will be performed as soon as a representative portion of a particular definable feature of work has been completed. This inspection, typically conducted on construction projects, will include the following:

- A check of preliminary work to ensure that it is in compliance with contract/project requirements and, for construction projects, Construction Quality Analysis Form and CSI Division Checklists located in the CSG toolbox on WESTONPortal.
- Verification of required control inspection, testing, and compliance.
- Verification that performance levels meet standards.
- Resolution of differences or conflicts in work scope or with contract specifications, etc.
- Safety checks to include compliance with the Site-Specific Health and Safety Plan (SSHSP) and activity hazard analysis.

The WESTON PM, site manager, or other designee will coordinate with the client to ensure that the initial-phase activities meet client/contract requirements and the established schedule is met and updated. The initial-phase actions should be shown in the schedule provided to the client.

A meeting should be conducted by the Project QC Representative and attended by the appropriate QC personnel and the work leader responsible for the definable feature of work. The results of the initial-phase inspection (e.g., discussion of acceptable standards, actions required) should be documented on the inspection form or by separate minutes prepared by the Project QC Representative and attached to the Daily QC and Production Report.

The initial phase should be repeated for each new crew to work on-site or any time acceptable specified quality standards are not being met or are revised.

7.5.6.3 Follow-Up Phase

Daily checks should be performed to ensure continuing compliance with contract requirements and, for construction projects, CSI Division Technical Summaries (located in the CSG toolbox on WESTONPortal) until completion of the particular feature of work. Checks should be documented in the project files. For construction projects, the Initial/Follow-Up Inspection Checklist should be used.

7.6 PROJECT CLOSEOUT AND FOLLOWUP

Upon project closeout, all project files must be collected, including electronic files of e-mails and documents; organized; purged of clearly unnecessary information and duplicates; and maintained or stored in the proper status depending upon continuing phases and need. Refer to OP 04-17-004, Archives Records Retention Procedures. The Project Closeout Checklist addresses all necessary closeout actions. A discussion of lessons learned should also be performed and documented at the close of the project.

7.7 CONTROL OF MONITORING AND MEASURING DEVICES

WESTON maintains primary equipment storage facilities (equipment stores) at three locations—West Chester, PA; Houston, TX; and Vernon Hills, IL. Each equipment store is responsible for testing and calibrating monitoring and measuring devices according to manufacturers' recommendations. Only equipment that is in current calibration will be used.

Test, measurement, and calibration records of all equipment are maintained by the appropriate WESTON equipment manager. The equipment shall be handled, stored, and secured in a manner that will ensure that it is not tampered with and retains accuracy for use.

SECTION 8: MEASUREMENT, ANALYSIS, AND IMPROVEMENT

Note: The PLC process, which is used to assess performance and identify successes and areas for improvement at various project stages, is described in Subsection 6.1.

8.1 MONITORING AND MEASUREMENT

8.1.1 CorpTrack

As part of WESTON's open-book policy, it has developed a system that provides a collection of reports and tools for viewing WESTON financial and performance information. CorpTrack is a Web-based financial module that provides managers with weekly expenditure details for labor, subcontractors, and other costs. CorpTrack provides WESTON PMs with real-time insight into complete project financial and schedule information. It has numerous Web-based applications for accounts receivable, income statements, days sales outstanding, resource utilization, and more. Also included are Excel spreadsheets for revenue, and Access databases for PMs, Cost of Sales, and Revenue. Depending on the content source, information is updated on daily, weekly, or monthly schedules.

Executive management uses CorpTrack as a launching point for monthly discussions with Division management ("CorpTrack meetings") to assess performance, quality, safety, and other issues.

8.1.2 EngageTrack

WESTON's EngageTrack system tracks Client Engagement for Key Clients to ensure that WESTON develops a clear understanding of how its Key Clients perceive performance, which helps drive actions for continuous improvement. WESTON uses information from various sources to assess client engagement. Face-to-face or phone conversations with a variety of client contacts at different levels and functions are most effective. EngageTrack allows users to view reports summarizing assessments for the current and prior month by CBT, division, and PC.

See Subsection 6.2.1 for a more complete description of EngageTrack.

8.1.3 Quality Scorecard

WESTON's Quality Scorecard (see Figure 7-1) is used to assess WESTON's ability to deliver quality to internal and external clients. The user (typically a Division or PC Manager) rates quality performance as exceptional, on-track, at-risk, or off-track in the following areas:

- Roles and Responsibilities Are Clearly Understood
- Client Engagement Effectiveness
- Project Quality Pledge Effectiveness
- Sharing Home Run Success Stories Is Improving Performances
- PLC Process Is Driving Effective Project Management
- Subcontractor Relationships Leveraged Effectively
- Quality of Project Deliverables
- Knowledge Sharing Is Improving Performance

The scorecard is on the agenda for each monthly CorpTrack meeting (see Subsection 7.1.1). PC Managers or their delegates also complete the scorecard to provide the input that the divisions need to complete their scorecards.

FIGURE 8-1 QUALITY SCORECARD

WESTON Quality Goal: Revitalize our quality program so that all EngageTrack client team members understand their role in meeting their client's exceptional performance expectations.

Time Period (Month Year) Rated: **Dec-09**

Division or PC Name: **Northeast**

Please select ratings in shaded areas and describe results, efforts, and action items to achieve the goals. Ratings defined on following sheet.

Quality Scorecard Elements	Current Rating	Previous Rating	Results, Efforts, and Action Items
Overall Performance	On Target	On Target	
Team Roles Roles and Responsibilities are Clearly Understood	Exceptional Performance	Exceptional Performance	
Client Engagement Client Engagement Effectiveness Project Quality Pledges Effectiveness Sharing Home Run Success Stories Is Improving Performance	Exceptional Performance	Exceptional Performance	
Value Creation and Risk Management Project Lifecycle Process Is Driving Effective Project Management Subcontractor Relationships Leveraged Effectively	At Risk	On Target	
Technical Execution Quality of Project Deliverables Knowledge Sharing Is Improving Performance	On Target	At Risk	

8.1.4 Safety Metrics and Scorecard

WESTON's safety record is world-class in delivering integrated, sustainable solutions for environmental restoration, property redevelopment, design/build construction, green buildings, renewable and clean energy, and natural resource conservation. WESTON uses a variety of metrics to track its safety performance.

The Interstate Experience Modification Rate (EMR) is a forecast for the upcoming year based on prior workers compensation loss experience. The EMR is calculated by a rating bureau (the National Council on Compensation Insurance) and it is based on workers' compensation claims during the prior 3-year period. For example, WESTON's 2008 EMR of 0.38 reflects workers compensation cases during 2004, 2005, and 2006. Work-related injuries and illnesses that occurred during 2007 are not part of WESTON's 2008 EMR since they are not yet considered to be "developed."

Another frequently used safety metric, the OSHA Recordable Incident Rate (ORIR), is based on the number of OSHA recordable cases, and the number of hours worked.

There are some limitations to the ORIR. Therefore, in 2007, WESTON developed and began using in 2007 for internal use, as defined below:

- WESTON Recordable Incident Rate (WRIR) covers all injuries to WESTON employees anywhere in the world. It is a function of all "recordable" cases and hours worked during a rolling 12-month period. It is based on a rolling 12-month period to smooth out the spikes that the ORIR can have.
- WESTON Global Incident Index (WGII) covers all injuries to WESTON employees and subcontractors anywhere in the world. Since this rate covers injuries to employees overseas as well as WESTON subcontractors, even if they are not under WESTON's direct daily supervision, the WGII is used as an internal metric to gauge WESTON's overall safety performance. It is also calculated on a rolling 12-month basis.

Because the WRIR and WGII are internal metrics developed by WESTON, there are no industry statistics or data published for benchmarking purposes. WESTON has gone beyond the requirements of OSHA recordkeeping in order to assess the safety program for any WESTON project in the world. This is important because many WESTON Key Clients do not see WESTON employees and subcontractors; they look at a project and see only WESTON.

Safety statistics are updated each month, and available on the Risk Management page of WESTONPortal.

WESTON's Safety Scorecard (see Figure 7-2) is used at both the Division and PC levels to assess areas of safety in which the group is performing well as well as areas needing improvement. The results of the scorecard at the Division level are discussed at the monthly CorpTrack meetings with executive management.

8.1.5 Project Audits and Reviews

To ensure the quality of the service and deliverables provided to clients, project reviews or audits are conducted by WESTON project representatives (e.g., project quality manager), a Service Line representative, or others. WESTON's CSG not only conducts audits and reviews, but also conducts proactive visits (staff assistance visits) in the early stages of a project primarily to provide advice on QA measures before issues arise (see CSG QMM referenced in Section 8).

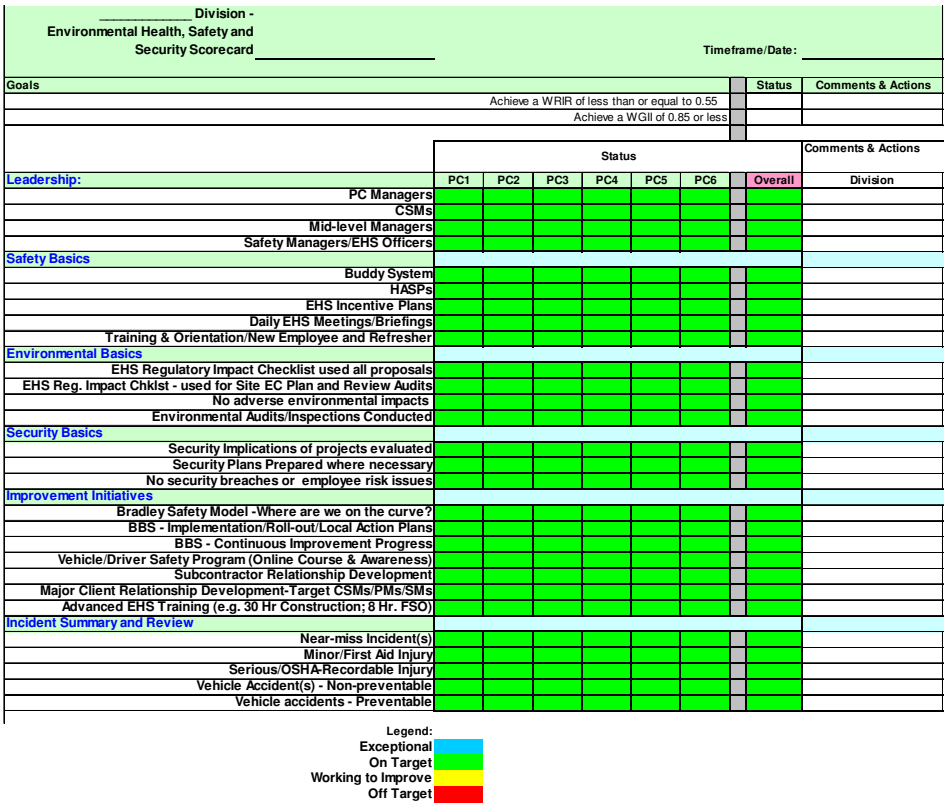
Project audits are performed periodically to gauge whether QA procedures are being adequately implemented to minimize quality incidents. Two tools used for performing effective project audits are as follows:

- **Project Audit Scorecard** (shown below in Figure 7-3): An Excel spreadsheet used to audit projects and score the audit results.
- **Project Audit Checklist, Field Work**: A one-page checklist of items to be checked during audits of field work.

8.1.6 Sustainability Scorecard

Fast-changing global conditions, a rising awareness of the impact we have on the environment and the planet, and government regulations are driving companies, communities, and institutions to address emerging requirements on sustainability issues like greenhouse gas management, green buildings, and increasingly scarce water and energy resources. WESTON provides expertise and services in each of these areas of sustainability. However, WESTON also "walks the talk" by making its internal operations more sustainable. To measure the achievement of each office in this area,

FIGURE 8-2 WESTON SAFETY SCORECARD



_____ Division -
Environmental Health, Safety and
Security Scorecard _____

Timeframe/Date: _____

Goals		Status	Comments & Actions
	Achieve a WRIR of less than or equal to 0.55		
	Achieve a WGII of 0.85 or less		

	Status							Comments & Actions
Leadership:	PC1	PC2	PC3	PC4	PC5	PC6	Overall	Division
PC Managers								
CSMs								
Mid-level Managers								
Safety Managers/EHS Officers								
Safety Basics								
Buddy System								
HASPs								
EHS Incentive Plans								
Daily EHS Meetings/Briefings								
Training & Orientation/New Employee and Refresher								
Environmental Basics								
EHS Regulatory Impact Checklist used all proposals								
EHS Reg. Impact Chklst - used for Site EC Plan and Review Audits								
No adverse environmental impacts								
Environmental Audits/Inspections Conducted								
Security Basics								
Security Implications of projects evaluated								
Security Plans Prepared where necessary								
No security breaches or employee risk issues								
Improvement Initiatives								
Bradley Safety Model -Where are we on the curve?								
BBS - Implementation/Roll-out/Local Action Plans								
BBS - Continuous Improvement Progress								
Vehicle/Driver Safety Program (Online Course & Awareness)								
Subcontractor Relationship Development								
Major Client Relationship Development-Target CSMs/PMs/SMs								
Advanced EHS Training (e.g. 30 Hr Construction; 8 Hr. FSO)								
Incident Summary and Review								
Near-miss Incident(s)								
Minor/First Aid Injury								
Serious/OSHA-Recordable Injury								
Vehicle Accident(s) - Non-preventable								
Vehicle accidents - Preventable								

Legend:
Exceptional
On Target
Working to Improve
Off Target

WESTON has developed a Sustainability Scorecard (Figure 7-4). The four sustainability categories rated are as follows:

- Sustainable offices
- Sustainable projects
- Employee engagement
- Making a difference/community partnering

Possible ratings range from off-target (red) to exceptional performance (blue). Rather than asking each office to tackle all areas at once, offices are asked to select one or two focus areas under each category.

FIGURE 8-3 PROJECT AUDIT SCORECARD

PROJECT NAME		99444.004.002.0002
Score as follows: Compliant = 2, Nearly Compliant = 1, Non-Compliant = 0, Not Applicable* = Blank		
QUALITY CHECKS/REQUIREMENTS	**Score**	**Comments**
Pre-Award		
Project Risk Level Determined (from Worksheet)		
Environ. Regulatory Impact Checklist completed		
Profitability Worksheet completed and reviewed		
Conflict-of-Interest check performed		
Appropriate pre-award Progress Check(s) completed, with proper approvals		
Proposal Signed as per Signature Authority		
Project Planning and Optimization		
Written Client Authorization – Indicate form of authorization under Comments		
Project Opening Meeting documented		
Project Quality Pledge documented and shared with team, including plan for exceeding client expectations		
Project Instructions/Project Plan – Includes scope, budget, schedule, deliverables/milestones, applicable regulations,		
Technical and subcontractor responsibilities documented and communicated		
Project Planning and Optimization Progress Check completed, with proper approvals		
Document control (filing) system implemented		
Health and Safety Plan completed		
QAPP, Quality Mgmt Plan, CQCP, or discipline-specific QC Plan(s)		
Project Implementation		
Monthly Project Review/Progress Check meetings completed with proper approvals. Address estimates-to-complete, earned value, DSO, scope creep, contract mods.		
Status meetings with project staff (note frequency)		
Project QC Representative performing quality control		
Field equipment inspected or tested before use (and documented)		
Equipment has been calibrated and calibration information is evident to user		
Project records are being maintained as required to document completion of project activities		
Frequent client communication (note how often)		
Documented reviews on all deliverables, following QC requirements		
Verification of quality of products or services procured per QC Plan. By whom?		
Solicited client satisfaction/engagement feedback (via survey or interview)		
Pre-Closeout Review Progress Check completed with proper approvals		
QUALITY CHECKS/REQUIREMENTS		
Project Closeout		
Closeout Progress Check completed with proper approvals		
Project records maintained as required to document completion of project activities		
Completed project Closeout QA Checklist (including project summary and lessons learned)		
TOTAL SCORE	0	
NUMBER OF QUESTIONS SCORED	0	
AVERAGE SCORE	#####	
* Must have explanation for any item determined to be Not Applicable.		
Click on arrow to go to next screen to document lessons learned, best practices, and corrective actions		

FIGURE 8-4 INTEGRATED SUSTAINABILITY INDEX SCORECARD

Integrated Sustainability Index Scorecard

Targeted Goal:Platinum, Gold, Silver, Bronze

Specific Focus area (i.e. decrease energy usage)

Select Ratings for current quarter. Describe efforts to achieve the targeted goal. (Rating descriptions on attached worksheet.)

Platinum	4 blues
Gold	3 blues, 1 greens
Silver	2 blues, 2 greens
Bronze	4 greens

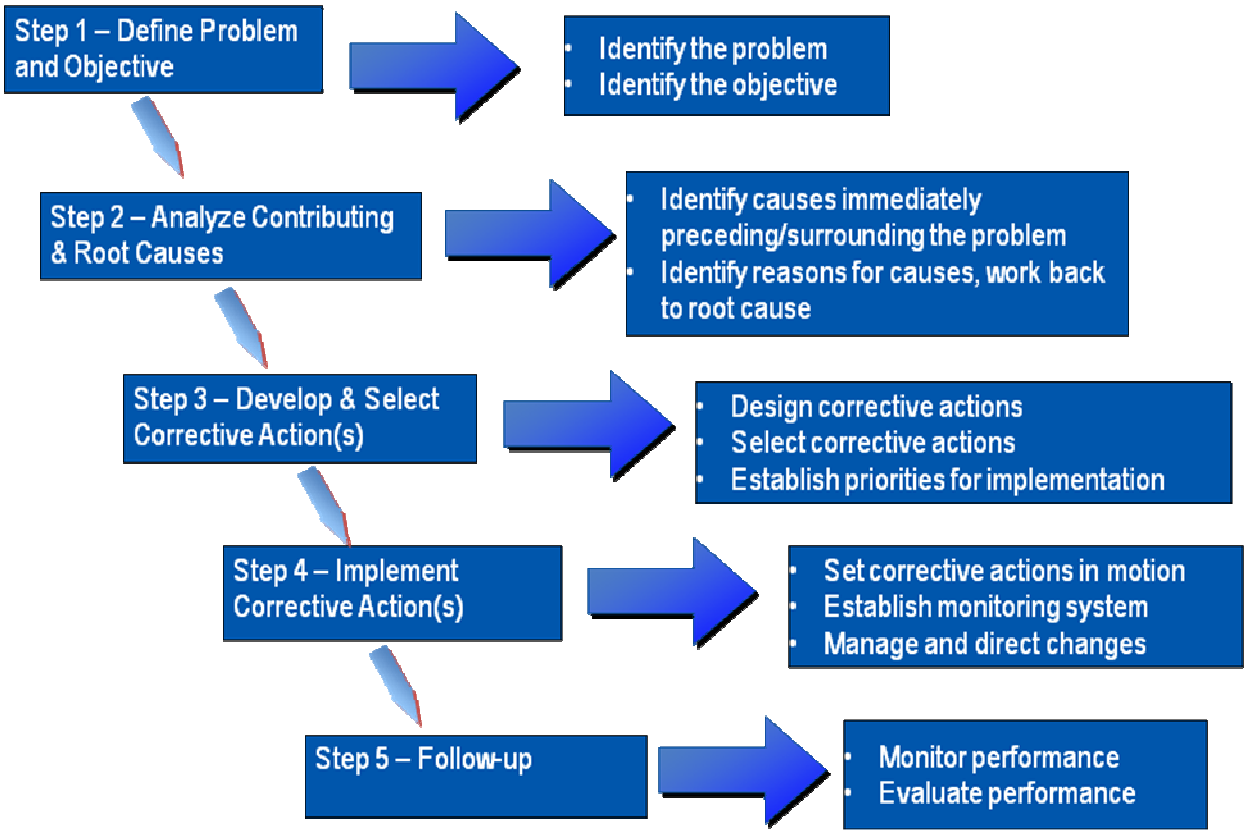
		Goal rating	Current rating	Description of goal, including one or two focus area(s) (i.e. decreased energy use)	Description of current status (inlcuding progress in other non-focus areas)
Sustainable offices		Blue	Yellow	Example Goal: Sustainability integrated into office operations. Example focus area: Decrease energy use by installation of light sensors.	Example focus area status: Researching types of light sensors
Potential Focus Areas	Resource use (energy, water, fuel)				
	Material use (paper, disposable plates, utensils, cups, environmentally preferred procurement)				
	Work environment				
	Innovation				
Sustainable projects		Green	Green		
Potential Focus Areas	Resource use (energy, water, fuel/travel)				
	Material use				
	Solid Waste				
	Innovation				
Employee Engagement		Green	Green		
Potential Focus Areas	Number of employees involved				
	Supported commuting alternatives				
	Hours of training, discussion, implementation				
	Innovation				
Making a Difference/Community Partnering		Green	Green		
Potential Focus Areas	Number & quality of projects				
	Sharing success stories and lessons learned				
	Percent and number employees participating				
	Innovation				

8.2 CONTROL OF UNDERPERFORMING PRODUCT

WESTON employs several methods (e.g., PLC process reviews, performing rework) for controlling underperforming projects or opportunities. In addition, WESTON conducts root- cause analyses on selected underperforming projects or opportunities annually. A root-cause analysis is an evaluation method that identifies the underlying causes of an undesired outcome. It determines what happened, how it happened, and why it happened. The objective is to identify corrective actions adequate to prevent recurrence and, thereby, ensure consistent performance and client engagement.

The root cause is the most fundamental aspect of an event or condition that can logically be identified and corrected. In contrast, the proximate cause (also known as the direct cause) is the event or condition that occurred directly before the undesired outcome and resulted in the occurrence. While it is tempting to stop at the immediate, direct causes, it is important to identify the underlying root causes. If the root causes are not identified and addressed, solutions are generated and implemented, but the underlying causes remain unaddressed and continue to produce similar problems in the same or related areas. The root-cause analysis process is diagrammed as follows:

FIGURE 8-5 ROOT-CAUSE ANALYSIS PROCESS



Note that the last two steps, implement correct actions and follow-up, are critical to achieving value in the root-cause analysis process (see Subsection 7.4, Improvements and Remedial Actions); otherwise, it is simply a paper exercise without benefits.

8.3 COLLECTION AND ANALYSIS OF QUALITY MANAGEMENT DATA

Step 2 of the Root-Cause Analysis process is to analyze contributing and root causes. Techniques used for this analysis include the following:

- Event and Causal Factor Tree
- Five Whys
- Relations Diagram
- Fishbone Diagram (Ishikawa)

The Relations Diagram, probably the most common root-cause analysis technique employed at WESTON, diagrams how different aspects of the problem were connected to visualize the relationships between problems and their root causes. The diagram consists of a circle of boxes that represent a problem or cause, with arrows pointing toward and away from each box. An arrow drawn toward a box reflects that that box is influenced by another factor. An arrow drawn away from a box indicates its influence on another factor. A factor with more arrows drawn toward it is an indicator (often a proximate or contributing factor) of a problem. A factor with more arrows pointing away from it is a driver. When the Relations Diagram is completed, the problem drivers are

more clearly identified, allowing WESTON to better understand the interrelationships of the various factors. This analysis helps to improve development and select corrective actions.

WESTON uses a number of other methods to collect and analyze quality management data. For example, its Quality Scorecard system, as described in Subsection 7.1.3, is used to collect quality information from every WESTON division.

8.4 IMPROVEMENTS AND REMEDIAL ACTIONS

8.4.1 Corrective Actions

As an outcome of the Root-Cause Analysis or auditing process, the team selects and designs corrective actions to address the root causes, then establishes priorities for selected corrective actions, focusing first on the actions that have the highest impact and are easiest to implement. Corrective actions are implemented as follows:

- Set corrective actions in motion and establish monitoring systems.
- Integrate the concept of change into daily work.
- Manage and direct the impact of that change to maintain organizational effectiveness and achieve performance goals.
- As a follow-up, monitor and evaluate future performance.

8.4.2 Preventive Action

Preventive action is the action taken to eliminate the causes of potential nonconformance in order to prevent their occurrence. WESTON has found the sharing of best practices and lessons learned to be a powerful preventive action and a much more cost-effective and efficient means of delivering quality than corrective action.

Project teams are major contributors to the sustained excellence and continual improvement of such matters as cost, efficiency, and customer satisfaction. During project execution, the project team develops innovative ways to address project challenges. These innovations are “Best Practices” that should be shared for the benefit of other project teams. Similarly, they may find that they have project experiences that resulted in successes or negative outcomes. These are “Lessons Learned” and also offer valuable information that should be shared with other project teams. These lessons learned and best practices should be shared as follows:

- At the monthly progress checks/review meetings for the project.
- At WESTON’s annual Quality Leadership Conference.
- With Quality Managers, as appropriate, who will share them through the Quality Network.
- On the Quality site on WESTONPortal for the PC and/or division. (Some with companywide relevance are presented on the WESTON Quality Management site on WESTONPortal or the EHS sites on WESTONPortal.)
- In PC and Division Quality newsletters.

The Corporate Quality Manager regularly visits various PCs. These “Quality Visits” provide an excellent opportunity to collect best practices from different offices that can be shared and leveraged across the company. To date, the Corporate Quality Manager has visited some 20 PCs

and has shared best practices gleaned from these visits through monthly Quality Network meetings, articles in *The WESTON Reporter Wire*, and visits to other offices.

Lessons learned are collected as part of WESTON's PLC process. For each phase of the process, respondents are asked "What would you do differently? What would you do again?" For major opportunities, these lessons learned are compiled and posted on the Client Business Development site on WESTONPortal for others to learn from and leverage on other opportunities.

CoPs are instrumental in sharing best practices and lessons learned with others who are most likely to apply them. CoPs at WESTON are described in Subsection 5.4.

WESTON's Quality Best Practices site on WESTONPortal can be searched to find a "better way" of approaching many quality-related challenges. New proposed best practices can be submitted to Service Line Leaders or Quality Network members for approval and sharing.

SECTION 9: DISCIPLINE-SPECIFIC QUALITY MANAGEMENT

Several WESTON service group, discipline, and client-specific requirements have been developed to the point that practitioners have prepared quality management programs specific to their areas or clients. These are listed below, along with the name of the Quality management documents developed:

- **Construction Support Group**: CSG Quality Management Manual
- **Engineering Design**: Engineering Design QA Management Plan
- **Integrated Air Services**: Integrated Air Services Quality Management Plan
- **U.S. Department of Energy**: Quality Assurance Program Description for U.S. Department of Energy Projects

Each of these quality plans/manuals are incorporated by reference here. While each programs' plan may differ in format, each has been found to comply with (and be equivalent to) the requirements of this QMM. It is expected that plans for additional programs will be developed, reviewed, and incorporated in this QMM if found to be equivalent.