EXPRO National Manual for Projects Management

Volume 12, Chapter 2

Project Quality Execution Procedure

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1.0 PURPOSE

The purpose of this procedure is to establish the direction, responsibilities and process to develop, execute and maintain a successful project Quality Management System (QMS).

This procedure applies to the management and control of activities performed on projects for the delivery of government construction projects across the Kingdom of Saudi Arabia (KSA).

This procedure specifies the project QMS requirements applicable to personnel who manage, perform, verify or review work affecting quality of the project, whether employed directly or indirectly by the Entities at execution locations.

The applicable requirements of this procedure shall be passed on to suppliers and subcontractors to assure the quality of products and services being provided.

2.0 SCOPE

This procedure is applicable to all government construction projects across the KSA. This procedure covers the entire life cycle of quality management systems used on construction projects.

The project quality organization, is a matrix group comprised of Quality Assurance (QA), Engineering, Procurement, Contracts, and Construction. The project QA organization has the overall responsibility for assuring project activities are performed and accomplished in accordance with the project's approved policies, procedures, and instructions. This may be accomplished through the performance of reviews, monitoring, surveillances, and quality audits of activities, including suppliers and subcontractors.

Project Engineering is responsible for assuring engineering and design activities performed by suppliers, and subcontractors are in accordance with the project procedures and/or specifications. This is accomplished through participation in the review, checking, design verification, and/or approval cycles for documents issued for use on the project.

Project Contracts, in close coordination with Project Engineering, Project Construction, and QA, is responsible for assuring services provided by subcontractors are managed in compliance with the project and contract requirements. This is accomplished through implementation of contract formation and administration requirements.

Project Construction is responsible for assuring fabrication, installation, and erection of facilities, and is in accordance with the design drawings and specification requirements. This is accomplished by Field Engineering oversight and verification through in-process inspection and attendance of testing and inspection activities in accordance with the project Inspection Test Plans.

The project QA organization will be under the leadership of the Project Quality Manager (PQM) who will report to the senior Project Manager. The PQM will be responsible for the overall management and oversight of quality functions and activities on the project.

Members of the project QA organization are independent from any respective project team that they are responsible for auditing. QA is responsible for the oversight coverage of engineering, design, procurement, construction, and construction management activities.

3.0 DEFINITIONS

Definitions	Description
CA/PA	Corrective Actions/Preventative Actions
KPI	Key Performance Indicator
KSA	Kingdom of Saudi Arabia
PM	Project Manager

Definitions	Description
PMT	Project Management Team
PQM	Project Quality Manager
PQP	Project Quality Plan
PT	Project Team
QMS	Quality Management System
QA	Quality Assurance
Quality Culture	A positive environment based on an organization's core values that encourages an individual and collective commitment to first-class and continuously improving quality performance.
Stage Gate	A gated project execution process that is designed to help project managers successfully organize, plan, set up, and execute construction projects.

4.0 REFERENCES

- EPM-EQ0-PR-000001 Project Stage Gate Procedure
- EPM-EQ0-PR-000004 Simplified Project Stage Gate Procedure
- EPM-EQA-PR-000001 Project Quality Assurance Audit Procedure
- EPM-EQ0-PR-000003 Project Quality Corrective and Preventative Action Procedure
- EPM-KCQ-PR-000005 Project Construction Quality Management System Procedure
- EPM-S00-GL-000002 Project Delivery Strategy
- ENT-EQ0-TM-000001 Quality Management Workshop
- ENT-EC0-PR-000001 Entity Continuous Improvement Program Management Procedure

5.0 RESPONSIBILITIES

See **Attachment 2** for the Quality Execution Responsibilities Matrix.

5.1 Project Manager (PM)

PM responsibilities:

- Establishing and maintaining a positive Quality Culture on the project
- Aligning and directing the Project Management Team (PMT) regarding expectations for execution of a successful quality program
- Ensuring that a project quality program is established, implemented, maintained, and audited
- Overall ownership and approval of the Project Quality Plan (PQP) in accordance with applicable EXPRO procedures
- Deployment of the Project Quality Manager (PQM)
- Delegating authority and accountability for administration and management of the project program to the PQM
- Ensuring project specific Stage Gate Checklists include questions that demonstrate implementation of the requirements of this procedure

5.2 Project Quality Manager (PQM)

PQM responsibilities:

- Identifying and avoiding potential performance risks associated with quality during project planning including development and implementation of mitigation plans
- Establishing and serving as the advocate for an effective and efficient quality management system based on project scope and requirements
- Helping to establish a defensible and effective graded approach to quality requirements
- Actively contributing to identification and implementation of solutions to performance problems associated with quality
- Assisting in measuring and periodically reporting quality performance, including achieving alignment with the various stakeholders to include contractors
- Providing expertise on quality requirements, related regulatory policies, and industry standards
- Leading the organization in establishing and continually improving the Quality Culture
- Managing conduct of audits, surveillances, and inspections to help ensure that project processes, deliverables, products, and services meet EXPRO expectations as well as contract and regulatory obligations
- Championing the achievement of performance excellence using the appropriate tools, such as Lean Six Sigma, root cause analysis, and behavior analysis techniques resulting in prompt and effective corrective and preventative actions
- Development of the PQP in accordance with Entity project requirements and applicable EXPRO procedures
- Staffing the project with trained and qualified Quality personnel
- Advising the PM on quality issues
- Providing quality related information to the Entity and EXPRO
- Recommending to the PM project specific Stage Gate deliverables in support of each Gate Review.

5.3 Project Management Team (PMT)

The PMT is responsible for:

- Providing input to the PM on quality cultural imperatives for the project
- Helping PM implement the Quality Culture
- Proposing to the PM project quality key performance indicator (KPIs) metrics from their respective areas of expertise
- Preparing and analyze department KPIs and identify areas of concern to PQM
- Developing appropriate actions to address areas of concern
- Collaborating with the PQM to ensure full understanding and support of the PQP
- Ensuring processes are in place to communicate quality information to the various project Stakeholders
- Executing the full implementation of the PQP within their respective organizations.

5.4 Project Team (PT)

PT responsibilities:

- Be aware of the project Quality Culture communicated by the PM
- Familiarizing with the Quality Imperatives and share with others
- Contributing to the continuous improvement program by identifying areas of improvement and helping to make improvements
- Supporting Quality metrics identification, measurements and analysis
- Participating in Project Quality Workshops and Quality Orientation sessions
- Executing work using established process and procedures
- Self-assessing work performance and communicate issues.

6.0 PROCESS

Nine-Step Process:

This procedure provides guidance by EXPRO to all KSA Entities through a nine-step process. Effective implementation depends on robust planning. Accordingly, the first seven of the nine steps are in the planning phase. Reference the Quality Execution Process Map (**Attachment 1**) and Quality Execution Responsibilities Matrix (**Attachment 2**) for more details.

Where applicable, sample deliverables for these steps are included in this procedure to enhance understanding and facilitate implementation. It is important to understand that while these nine steps are roughly sequential, actual execution reflects several overlapping areas and requires an iterative approach.

The nine steps are as follows:

1. Initiate Quality Planning
2. Identify and Validate Quality Requirements
3. Specify Quality Expectations
4. Set Quality Culture Imperatives
5. Establish Quality Foundation
6. Establish Metrics Management Plan
7. Establish Project Quality Plan (PQP)
8. Roll-Out PQP to Project Team
9. Execution, Assessment & Improvement

6.1 Step 1: Initiate Quality Planning

The PM shall identify and appoint an appropriate PQM for each large Project or combination of smaller projects working with the Entity management team. The successful identification and installation of a qualified PQM is vital to the success of the project's Quality program.

Note: The PQM reports operationally to the PM. Functionally, the PQM reports to the appropriate Entity Quality Manager or designee.

6.2 Step 2: Identify and Validate Quality Requirements

The PQM, with the support of the PM and other members of the PMT shall:

- Ensure that the project's specific quality requirements from the prime contract, internal requirements, and external requirements (e.g. regulatory bodies) are identified and appropriately assigned to a specific discipline or individual for implementation
- Collaborate with the Entity management or designee to ensure that project-specific quality requirements are consistent with Entity standards as well as applicable KSA standards.

The PMT shall ensure that:

- Requirements are embedded into procedures and other appropriate documents to be used by the project
- Staff fully implements processes that satisfies quality requirements

Examples: There may be a host of specific sources of quality requirements. Some will be obvious and others will be subtle and will need to be researched and given visibility. Some examples where quality requirements may be found include:

- Entity expectations or preferences that provide clarity to the contract
- Regulatory requirements including national and local laws and specific regulations on zoning and permit requirements
- EXPRO requirements found in the 'EXPRO National Manual for Projects Management ' that identify specific work execution requirements including identified process and procedures
- Applicable external requirements such as industry and commercial codes and standards, that are implied or are inherent to the nature of the work
- Legal requirements for either monitoring or reporting of data or conditions
- Applicable industry practices either formally required or adopted by the project as a standard or guide.

6.3 Step 3: Specify Quality Expectations

The PM, with the assistance of the PQM and the rest of the PMT, shall ensure alignment with the Entity regarding a common understanding of the following:

- Project quality requirements including interpretations and expectations
- Vision of high quality performance including metrics (see Step 6 for more details on metrics)
- Any other quality expectations of the Entity and other external stakeholders as necessary.
- Include both requirements and expectations as appropriate in contracts or third-party firms (e.g. joint venture entities, third-party engineering, construction)
- Implications of the above topics to the Project Quality Plan identified in Step 7.

6.4 Step 4: Set Quality Cultural Imperatives

The PM, with input from the PMT, shall establish quality cultural imperatives for the project. These imperatives shall be published in a manner visible to all key stakeholders and project personnel (quality posters, bulletins, etc.)

Actions and examples to achieve a positive Quality Culture are discussed in Step 5, Establish Quality Foundation.

Example: A standard Quality Absolutes Template is included as **Attachment 3.**

6.5 Step 5: Establish Quality Foundation

To achieve successful quality program implementation, the PM and PMT (including the PQM) shall implement processes and actions that make the positive Quality Culture described in Step 4 a reality.

Examples:

Leadership Engagement

- Quality Leadership Committee/Review Board - This effort should be chaired by the PM and include senior members of the PMT. The purpose of this group is to ensure identified problems are addressed in a transparent and timely manner, causal analyses are robust, and corrective/preventative actions are appropriate and effective. This group also manages the quality recognition program and reviews quality performance metrics (see Step 6, Metrics Management Plan). This group typically meets monthly or when needed.
- Quality Engagement Team (s) - One employee-led team should be established to drive the Quality Culture and performance from the bottom up in the organization. The team should include both manual and non-manual personnel from all departments of the project. The objective of this team is to identify quality-related issues and work to resolve these issues at the working level. Quality issues that cannot be resolved in this meeting should be elevated to the Quality Review Board. This group typically meets monthly or when needed.
- Communication/awareness program - Active, open and regular communications with project team (e.g. recognition events, all hands meetings, newsletters, bulletins) Celebrate project success as well as transparently deal with quality challenges and problems.

Technical Process/Tools

- Quality control plans for critical operations - for activities with high quality risk, develop and execute specific quality plans to ensure successful operations the first time.
- Quality expectations in work packages - Ensure employees are fully aware of what successful achievement of quality looks like by including quality expectations and acceptance criteria in work packages.
- Operational readiness - Incorporate safety quality into the daily safety reviews by using a hazards identification process to identify and prevent hazards from materializing before the work begins.
- Continuous Improvement - fully utilize Lean Six Sigma tools and resources to evaluate quality performance, identify critical inputs, ascertain causes of quality problems, and drive effective improvements in quality performance.
- Manage quality risk - Define, understand, communicate, and control parameters affecting achievement of stated quality goals. Implementation of a project-specific action plan will form a strong foundation for the project to establish the desired culture. The action plan is also the basis for the content of Project Quality Workshops to be held for quality awareness and orientation.

Human Dynamic

- Quality recognition program - Reinforce desired behavior by rewarding employees who identify or help address quality problems or utilize pause/stop work for quality concerns.
- Quality Orientation & Training - Employee orientation includes both Quality Awareness and Quality Leadership Training. Additional quality training is dynamic and responsive to project needs.

Example: A standard Quality work execution process is included as **Attachment 4** (Plan-Do-Check-Act).

6.6 Step 6: Establish Metrics Management Plan

The PM shall ensure the project has identified key performance indicator metrics that reflect quality performance in a management plan. Internal performance is an important consideration in finalizing project quality metrics. Metrics associated with department interfaces should be considered.

The Metrics Management Plan shall include measurement methods, frequency of measurement, communication methods, control limits, corrective action responsibility, and consequences (favorable and unfavorable). The metrics in the management plan shall comply with Entity requirements.

Metrics management must be a dynamic and fluid process. Time phase of the project as well as experience with given metrics will drive changes to metrics and the management plan. It is expected that metrics will be added and removed throughout the life of the project.

The PMT shall:

- Propose to the PM quality metrics for their respective areas in support of the metrics management plan. Identification of these metrics should include those necessary to satisfy both internal and external customers, as well as those necessary for effective/efficient operation of their function
- Prepare and analyze metrics in areas of responsibility and develop appropriate actions to address concerns
- Propose changes to metrics and the management plan to ensure metrics are meaningful.

The PQM or designee shall:

- Engage the stakeholders to ensure contractual requirements for metrics are addressed and agreed
- Publish the metrics management plan in accordance with the PM's direction
- Facilitate joint publication of metrics in support of project quality dashboards, Entity quarterly quality reports, and other EXPRO reporting requirements
- Collaborate with other functions in the analysis of project quality metrics and determination of appropriate actions
- Ensure the appropriate level of project personnel, customers, suppliers, and other stakeholders are engaged in this process.

Note: While leading indicators are preferred, it is important to understand that accurate lagging indicators are necessary to establish leading indicators (i.e. to be a leading indicator means there is a demonstrated correlation with one or more lagging indicators).

6.7 Step 7: Establish Project Quality Plan (PQP)

Project Quality Plan (PQP) (See **Attachment 5**) is used to ensure that the quality is central and pivotal to any project. PQP will identify all the tasks and activities need to be undertaken to ensure that the quality expectations of the client and the requirements of the EXPRO National Manual for Projects Management are met. PQP is built in compliance with ISO9001:2015 Standard requirements.

With all the steps completed as described in Steps 1 through 6, the:

PM shall:

- Maintain approval authority of the PQP
- Reference the PQP in the Project Delivery Strategy (see EPM-S00-GL-000002 Project Delivery Strategy)

The PQM shall:

- Draft the PQP according with Entity and EXPRO requirements
- Finalize and issue the PQP after review and approval by the PM and appropriate Entity designee.

The PMT shall:

- Collaborate with the PQM to ensure full PMT understanding and agreement with the final PQP document.

6.8 Step 8: Roll-Out Project Quality Plan to Project Team

Once the project approach to quality has been finalized including alignment with the Entity, it is critical that all project personnel fully understand what is expected of them.

The PM shall:

- Establish requirements for quality induction of project employees based on recommendations from the PQM in order to raise awareness of quality requirements among employees.
- Ensure the Quality Culture Imperatives are communicated to all employees and reinforced with multiple communications (e.g. all hands meetings, postings, project emails, etc.)

The PQM shall:

- Develop and conduct quality orientation training consistent with project requirements and Quality Culture imperatives endorsed by the project to drive a positive Quality Culture. Quality orientation will be given to new employees as they are assigned to the project.
- Develop and conduct Project Quality Workshops throughout the life of the project as necessary or directed by the PM
- Develop and conduct Project Quality Workshops in conjunction with other projects, for key suppliers and major subcontractors. Note: This may be accomplished at the Entity level when Key Subcontractors/Suppliers are shared among projects.

The PMT shall:

- Ensure project processes are in place to communicate quality information to all project Stakeholders (e.g. Entity representatives, suppliers, contractors/subcontractors, off-project personnel supporting the project).

6.9 Step 9: Execution, Assessment & Improvement

Quality performance is verified and delivered during the project execution phase. Successful project quality performance is dependent upon disciplined execution of the PQP developed and communicated in previous steps.

The PM shall:

- Create and maintain a positive Quality Culture on the project
- Hold the PMT and all project personnel accountable for delivering quality and executing to the project quality program, including approved project processes and procedures, in accordance with the approved quality plan
- Ensure quality issues are addressed in a timely and transparent manner
- Ensure causal analyses are conducted when warranted, and effective actions taken as required
- Conduct formal periodic management reviews of project quality performance with PMT, quarterly at a minimum, and take actions to improve performance
- Review project quality performance periodically with Entity to maintain alignment between quality performance and perception of quality performance
- Ensure lessons learned on project are shared outside the project
- Ensure robust implementation of the Stage Gate process that includes taking timely and effective actions to address issues resulting from reviews
- Hold PMT accountable for providing qualified project staff in accordance with the Entity requirements.

The PQM shall:

- Support the PM activities listed above:
- Proactively identify quality risks throughout the life of the project and help the PMT develop and implement solution, as appropriate

- Develop and execute assessment schedule (audits and surveillances) with focus on most significant quality risks based on input from the PM and PMT (see EPM-EQA-PR-000001 Project Quality Assurance Audit Procedure)
- Utilize table top and pre-task assessments to ensure operational readiness for critical operations prior to execution (where practical)
- Support the PM by co-chairing meetings to review project quality performance
- Provide resources and subject matter expertise to conduct causal analyses and identify solution to quality challenges and problems
- Actively engage Stakeholder quality representatives to maintain alignment between measurement and perception of project quality performance
- Execute Stage Gate process as required by the Entity and EXPRO procedures (see EPM-EQ0-PR-000001 Project Stage Gate Procedure)
- Provide qualified staff members as required by the Entity and EXPRO requirements.

The PMT shall:

- Execute to the approved PQP
- Ensure all project personnel understand the project quality program and hold them accountable for delivering quality and executing to the approved procedures
- Provide qualified staff members as required by the Entity and/or EXPRO
- Execute Stage Gate process as required by Entity and/or EXPRO procedures
- Conduct self or management assessments to understand quality performance of their organizations and take actions as necessary
- Provide resources and subject matter expertise to conduct causal analyses and identify solutions to quality challenges and problems
- Actively engage stakeholder representative(s) to maintain alignment between measurement and perception of functional and project quality performance
- Incorporate table top and pre-task assessments into project processes to ensure operational readiness for critical operations (as defined by the project) prior to work execution.

The PT shall:

- Be aware of the project Quality Culture communicated by the PM
- Be familiar with the Quality Imperatives and share with others (see **Attachment 3**)
- Contribute to the continuous improvement program by identifying areas of improvement and helping to make those improvements (ENT-EC0-PR-000001 Entity Continuous Improvement Program Management Procedure)
- Support Quality metrics identification, measurements and analysis
- Participate in Project Quality Workshops and Orientation sessions (see ENT-EQ0-TM-000001 Quality Management Workshop)
- Execute work using established process and procedures
- Self-assess work performance and communicate issues.

The Entity and/or EXPRO shall:

- Perform periodic assessments of the use of Quality process and procedures
- Provide resources and training on Cause Analysis
- Support continuous improvement efforts

- Establish and utilize Lessons Learned program.

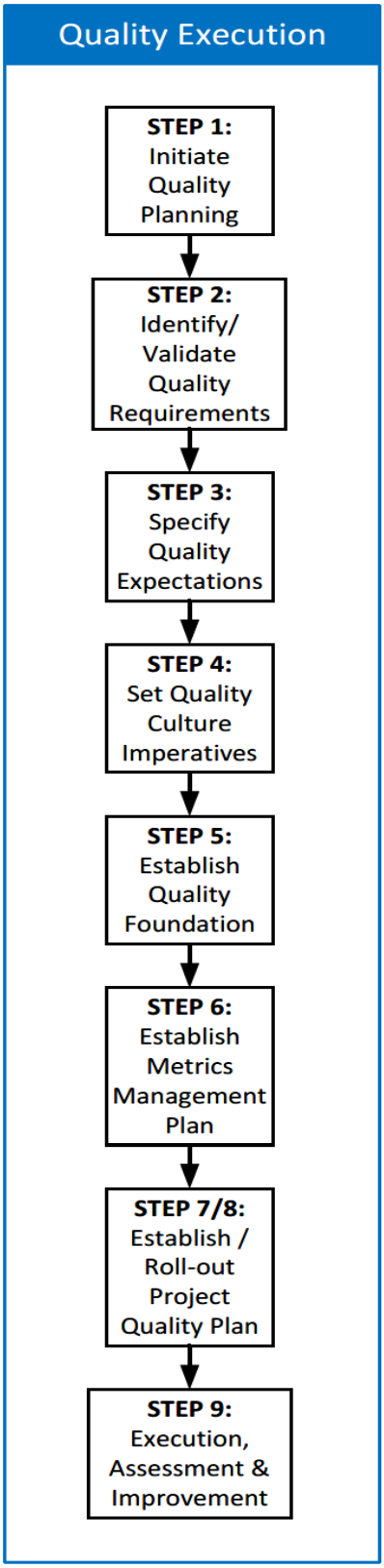
Examples: The inputs for formal management review meetings on project quality performance can include a review of the following:

- Project KPI performance
- Results from various reviews (Stage Gate, audits, surveillance, management/self-assessments, project reviews)
- Process performance
- Corrective and preventative action status
- EXPRO reviews
- Entity feedback and assessments
- Subject matter expert reviews
- Opportunities to review and modify project quality objectives.

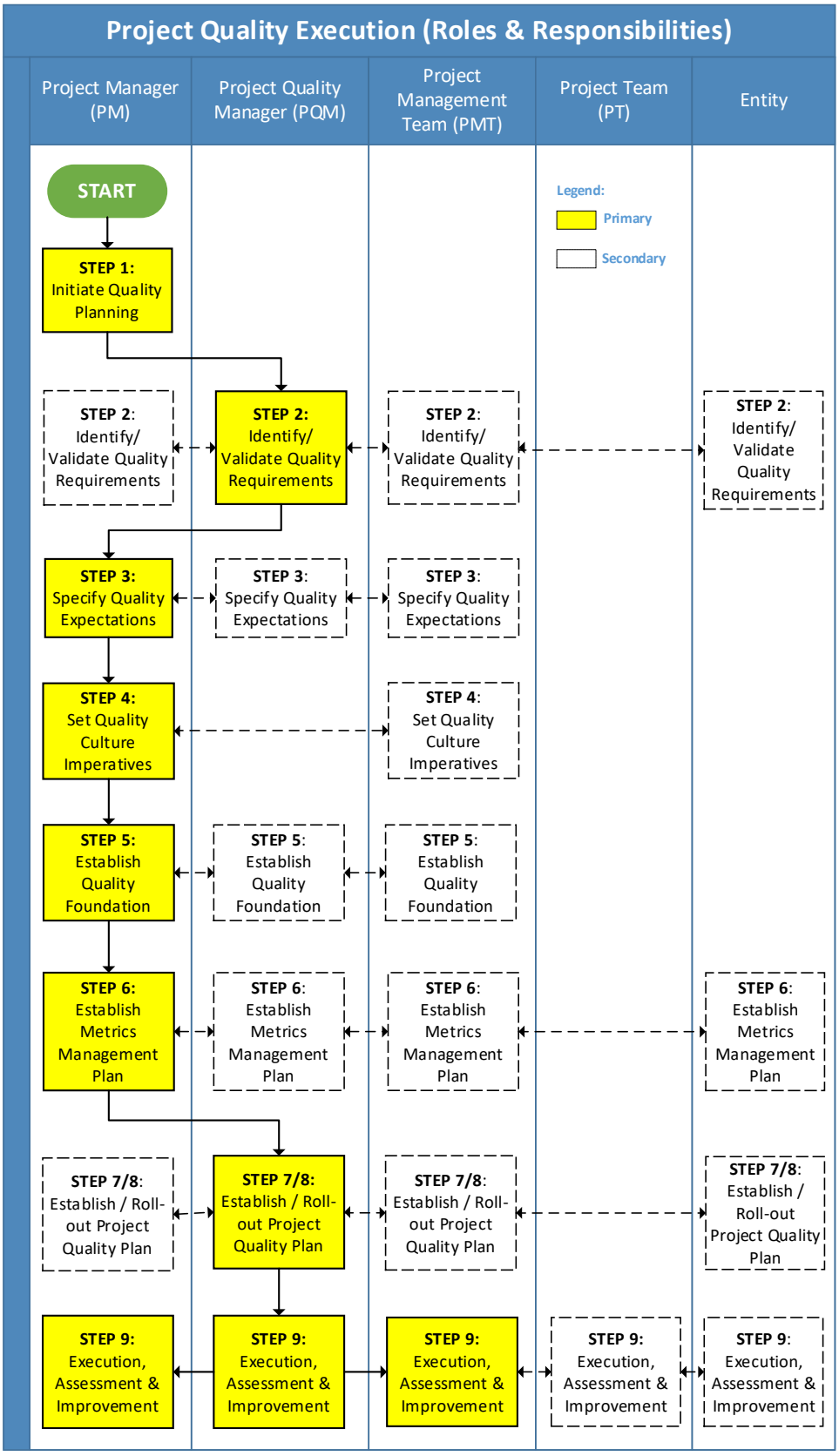
7.0 ATTACHMENTS

1. Quality Execution Process Map
2. Quality Execution Responsibilities Matrix
3. EPM-EQ0-TP-000014 - Project Quality Absolutes Template
4. EPM-EQ0-TP-000003 - PDCA (Plan-Do-Check-Act) Template
5. Project Quality Plan (PQP) Guidelines

Attachment 1 - Quality Execution Process Map



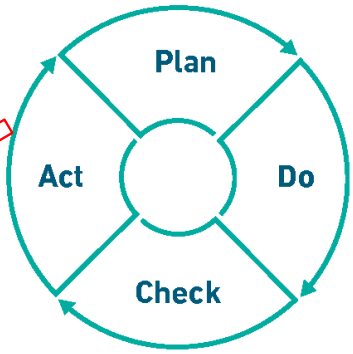
Attachment 2 - Quality Execution Responsibilities Matrix



Attachment 3 - EPM-EQ0-TP-000014 - Project Quality Absolutes Template

Attachment 4 - EPM-EQ0-TP-000003 - PDCA (Plan-Do-Check-Act) Template

XXXXXXXX has recently adopted the quality concept of PDCA (Plan-Do-Check-Act) also known as the Deming Cycle. PDCA was popularized by Quality Expert Dr. W. Edwards Deming and the 4 step model is used to improve the effectiveness of processes within a projects organization like XXXXXXXX.



Plan

- State quantitatively your targeted expectations and the favorable outcome you seek to achieve

Do

- Test the potential solution with a small-scale pilot project. This will allow you to assess whether your proposed change(s) achieve the desired outcome or not.
- Document the results of your pilot project

Check

- Analyze your pilot project's results against the expectations that you defined in Step 1 to determine whether the idea has worked

Act

- Implement the solution and remember that PDCA (Plan-Do-Check-Act) is a loop, and you will continue to look for ways to improve it.
- Document the results
- Inform others about the process changes; update related procedure/instructions when applicable

Attachment 5 – PQP (Project Quality Plan) Guidelines

EXPRO
هيئة كفاءة الإنفاق والمشروعات الحكومية
Expenditure Efficiency & Projects Authority

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Project Quality Plan Guidelines

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Engineer Review Status	Date:	Name:
	A - Reviewed; Work may proceed	
	B - Reviewed with comments; Revise and resubmit; Work may proceed subject to incorporation of comments	
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