Chapter 3
The COTCO Environmental Monitoring Organization for the Project

3.0 INTRODUCTION

In order for effective environmental management to occur during a project, all participating parties must know their responsibilities related to the protection of environmental and socioeconomic resources and be committed to implementing actions and measures to fulfill these responsibilities. With regard to the Cameroon portion of the Chad Export Project, the parties that have environmental management responsibilities are:

- COTCO's Contractors;
- COTCO; and
- The Republic of Cameroon.

This Chapter will focus on the environmental monitoring responsibilities of COTCO and its Contractors, the structures of the Contractors' and COTCO's environmental monitoring organizations, and COTCO's overall environmental management approach for the Project. Specifically, this Chapter will:

- Outline the manner in which Engineering, Procurement, and Construction (EPC) Contractors will monitor environmental performance during the construction phase of the Project;
- Outline the manner in which COTCO will monitor the environmental aspects of the Project; and
- Outline the overall environmental management framework to be utilized by COTCO.

The Republic of Cameroon's environmental management responsibilities are presented in Chapter 2's tables, and its environmental monitoring organization for the Project is discussed in Chapter 4.

3.1 PROJECT ENVIRONMENTAL MANAGEMENT FRAMEWORK

3.1.1 Overview of Environmental Management Roles of COTCO and Its Contractors

The following strategy will be employed by COTCO to manage environmental matters in order to ensure that commitments related to biophysical, socioeconomic, and health (BP/SE/H) topics are satisfied:

- COTCO, with input from the Republic of Cameroon, has developed this EMP, which will be provided to Contractors as an aid in developing their own activity-specific Contractor environmental management plans. Also, COTCO has developed and will continue to

develop environmental requirements, specifications, and procedures. COTCO will contractually bind the EPC Contractors (and Sub-Contractors) working on the construction phase of the Project to comply with these environmental requirements, specifications, and procedures, as applicable to their specific work.

- Prior to initiating work on the Project, each major EPC Contractor must:
  - Develop an Environmental Management Plan and, as applicable, a Waste Management Plan, a Spill Response Plan, a Soil Erosion Mitigation Plan, a Socioeconomic Plan, a Health Plan, and a Safety Plan; and
  - Establish an environmental and socioeconomic quality assurance process that will define and assign environmental and socioeconomic management-related duties to specific staff positions.

  A major EPC Contractor's environmental plans as well as his Contractor quality assurance processes and organizations must be approved by COTCO prior to initiation of construction activities by that Contractor. COTCO will also provide the Contractors' plans to appropriate representatives of the Republic of Cameroon.

  To be approved, Contractor environmental plans must be in harmony with and meet the level of protection of the Project's EMP and the BP/SE/H-related requirements and specifications in Volume 2 of this EMP. Each Contractor will be required to comply with its own environmental management plan and any associated plans.

- During the construction phase of the Project, work activities will be monitored on four levels to ensure that biophysical, socioeconomic, and health-related requirements, operations, goals, and objectives are satisfied.
  - First, Contractors' Construction Managers and Supervisors will be responsible for ensuring that their work is in compliance with the Project's BP/SE/H-related requirements and specifications, as well as with the Contractor-specific environmental plans.
  - Second, Contractor environmental quality assurance monitors from an independent function within each major EPC Contractor's organization will observe on-the-ground activities to identify areas where Contractor performance relative to BP/SE/H matters may not be in compliance with the Project's BP/SE/H-related requirements and specifications and/or the Contractor-specific environmental plans.
  - Third, environmental field monitors from COTCO's in-country environmental monitoring organization will observe and audit Contractor activities as well as COTCO's activities to ensure that work is in compliance with the Project's EMP and BP/SE/H-related requirements and specifications, as well as Contractor-specific environmental plans.
  - Fourth, representatives of the environmental organization of the Project Management Company working under a contractual agreement with COTCO will conduct periodic

audits of environmental and socioeconomic performance in order to assist COTCO in assuring that the Project's environmental requirements, specifications, goals, and objectives are satisfied.

If a performance shortcoming is identified at any of the monitoring levels listed above, the Contractor's Construction Manager (or COTCO's In-Country Construction Manager, as appropriate) will be responsible for rectifying the situation in an appropriate and expeditious manner. Corrective actions will be documented and will be subject to potential audit by the Contractor's and/or COTCO's monitoring organizations, as well as by the Project Management Company's environmental organization.

Overall, the number of individuals assigned by each of the EPC Contractors to manage/monitor BP/SE/H issues and situations together with the number of individuals associated with COTCO's environmental monitoring organization should provide for an appropriate focus on environmental matters. In addition, the Republic of Cameroon will utilize its own BP/SE/H monitoring organization to continually assess the environmental performance of COTCO and its Contractors (see Chapter 4).

- During the operations phase of the Project, some environmental monitoring activities will be transferred to COTCO's operations/maintenance personnel, and a smaller organization within COTCO will be used to ensure that operations and facility maintenance activities are conducted in a manner that is compliant with COTCO's environmental requirements, specifications, objectives, and goals under this EMP.

3.2 MANAGEMENT AND MONITORING OF BP/SE/H MATTERS BY CONSTRUCTION CONTRACTORS

COTCO will engage a limited number of EPC Contractors during the construction phase of the Project. Major EPC contracts related to the Project are expected to be issued in the following areas:

- Construction of the Cameroon Transportation System's pipeline;
- Construction of Pump Stations #2 and #3 and the Pressure Reducing Station;
- Construction of the marine terminal and its associated facilities;
- Infrastructure construction and improvements associated with constructing the Cameroon Transportation System;
- Logistical support of the construction activities; and
- Telecommunications support of the construction activities.

As discussed in the following sections, each major EPC Contractor selected to work on the Project will be responsible for:

- Developing environmental management plans that are in harmony with the Project's EMP and BP/SE/H-related requirements and specifications; and
- Managing and monitoring construction activities in order to assure compliance with Contractor environmental plans as well as the Project's BP/SE/H-related requirements and specifications.

3.2.1 Contractors' Environmental Plans

Major EPC Contractors that are selected to work on the construction phase of the Project will be contractually obligated to prepare, for COTCO approval, a number of environmental plans for the work areas/activities for which they are responsible. These will include, as applicable to their work:

- An Environmental Management Plan, which would cover various BP/SE/H topics including habitat access management and archaeology, as well as the following related plans or sub-plans:
  - Soil Erosion Mitigation Plan;
  - Waste Management Plan;
  - Spill Response Plan;
  - Socioeconomic Plan;
  - Health Plan; and
  - Safety Plan.

COTCO requires that each Contractor's environmental plans outline and describe the detailed processes that the Contractor will use to govern the work of engineering and constructing the Cameroon Transportation System's facilities and infrastructure. Furthermore, the contents of these plans must be in accordance with the Project's BP/SE/H-related requirements and specifications and this EMP, as well as the operations integrity management system adopted by COTCO (see Section 3.5). COTCO must review, upgrade if necessary, and approve these plans prior to the commencement of construction activities by the Contractor.

3.2.2 Construction Contractors' Environmental Quality Assurance Organizations

Each major EPC Contractor will be contractually obligated to have an environmental and socioeconomic quality assurance organization in place in order to ensure that the Project's environmental requirements, specifications, goals, and objectives are satisfied. Specifically, each Contractor is required to:

- Create and appoint an environmental manager and an appropriate number of environmental supervisors and field environmental monitors; and

- Provide COTCO with a detailed description of the duties and responsibilities associated with each of these environmental assurance/monitoring positions.

Prior to the initiation of work, COTCO will review, upgrade if necessary, and approve each Contractor's environmental quality assurance organizational structure, management staff qualifications, and responsibility descriptions, as well as training plans for Contractor environmental and other staff.

Each major EPC Contractor will also be contractually bound to establish an environmental monitoring organization with lines of authority that avoid conflict of purpose with construction/operations groups. Though each Contractor's environmental monitoring organization may be somewhat different in a structural sense, notionally such an organization would be similar to that depicted in Figure 3.1. The exact nature of each EPC Contractor's environmental quality assurance organization will be detailed in the Environmental Management Plans that each Contractor must submit to COTCO for review and approval.

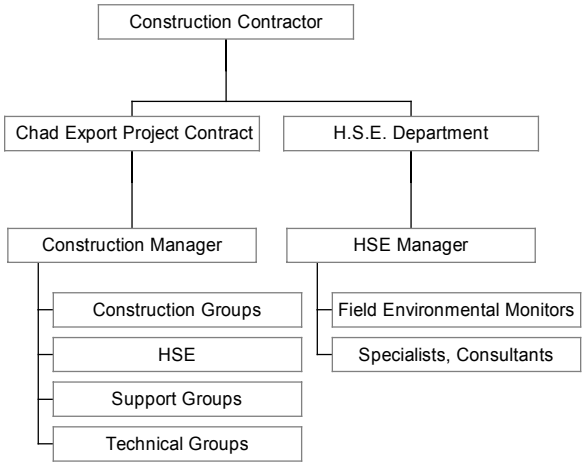

Figure 3.1 An Example of the Structure of a Typical EPC Contractor's Management Organization

It is expected that, in addition to the environmental personnel within an EPC Contractor's independent quality assurance monitoring organization, the Contractor's construction organization will include environmental professionals dedicated to implementing practical solutions to environmental problems.

3.2.3 Roles of EPC Contractors' Environmental Quality Assurance Personnel

As has been described previously, it is the responsibility of those EPC Contractor personnel who are assigned specific environmental/socioeconomic quality assurance monitoring duties to ensure that construction-related activities are in compliance with:

- Applicable environmental, socioeconomic, and health-related government regulations;
- The Project's requirements and specifications regarding biophysical, socioeconomic, and health topics; and
- The specific Contractor's environmental management plan and its associated plans.

Prior to the commencement of construction activities, each major EPC Contractor will:

- Define their environmental and socioeconomic oversight processes which will include procedures for:
  - Ensuring that environmental plans are in place prior to the initiation of construction activities;
  - Ensuring that environmental permits/approvals required for a specific construction activity are in place prior to commencing work;
  - Inspecting work and camp sites and construction activities in order to judge their compliance with Contractor environmental plans, the Project's environmental and socioeconomic requirements and specifications;
  - Invoking appropriate and expeditious corrective actions in the event that compliance shortcomings are identified;
  - Stopping construction activities in the event of a serious non-compliance situation; and
  - Reporting construction-related environmental and socioeconomic performance to COTCO's environmental monitoring organization.
- Define the job duties and reporting relationships for EPC Contractor personnel having environmental and/or socioeconomic assurance/monitoring responsibilities.

Each major EPC Contractor's proposed environmental and socioeconomic quality assurance/monitoring processes will be reviewed and approved by COTCO prior to the commencement of the specific construction activities by that Contractor. In addition, Contractors will be contractually obligated to submit a detailed Environmental Management Plan to COTCO for review and approval. The finalized version of each Contractor's Plan (the contents of which will be consistent with this Environmental Management Plan) will be provided to appropriate officials from the Republic of Cameroon.

During the actual construction period, each major EPC Contractor will be responsible for the following:

- Inspecting work sites on a frequent basis in order to assure that construction activities are in compliance with the Project's environmental and socioeconomic requirements and specifications and with the Contractor's own environmental management plan and its associated plans;
- Stewarding their progress and performance regarding environmental and socioeconomic matters;
- Appropriately and expeditiously rectifying identified environmental and socioeconomic performance shortcomings;
- Assuring that construction and camp-type wastes are handled, stored, transported, and disposed of in a manner that is consistent with the Project's waste management strategy (see Volume 5 of this EMP);
- Assuring that hazardous materials, fuels, chemicals, and other dangerous substances are handled, used, and stored in an appropriate and prudent manner; and
- Communicating with COTCO's In-Country Construction and In-Country BP/SE/H Managers regarding environmental performance-related matters as well as problem areas on an as-needed and scheduled basis.

3.2.4 Contractors' Internal and External Communications

3.2.4.1 Communications Between Contractor Environmental Quality Assurance Organizations and Contractor Construction Organizations

Since each major EPC Contractor's environmental quality assurance organization will be primarily responsible for working with the Contractor's construction organizations to improve environmental performance of the Contractor, it will be a prime responsibility of the environmental quality assurance organization to communicate with the Contractor's construction organization regarding potential or actual non-compliance situations. This communication will typically be handled immediately at the site and will occur between the field environmental quality assurance monitor and the site construction supervisor. The Contractor's field environmental quality assurance monitors will have the authority to stop work at the site if a serious non-compliance situation is identified.

Regardless of communications on site, all non-compliance situations will be documented, with reports being forwarded to COTCO, the Contractor's construction organization and the manager of the Contractor's environmental quality assurance organization. It is anticipated that the manager of the Contractor's environmental quality assurance organization will communicate

with appropriate managers and supervisors within the Contractor's construction organization in order to appropriately and expeditiously rectify potential and actual non-compliance situations.

3.2.4.2 Contractor Communications with COTCO

Representatives from Contractors' environmental quality assurance organizations will be responsible for:

- Communicating informally with COTCO environmental field monitors on a day-to-day basis regarding site-specific environmental compliance status and emerging issues;
- Communicating all compliance results, including non-compliance situations and the resolution thereof, to COTCO via the submission of formal summary reports and incident reports; and
- Communicating with representatives from COTCO's environmental monitoring and construction organizations regarding general compliance status, emerging issues, and specific environmental compliance issues through scheduled and as-needed meetings.

Representatives from Contractors' environmental quality assurance and construction organizations will also be responsible for addressing non-compliance situations identified by COTCO's environmental monitoring organization. These will be communicated to the Contractor through representatives of COTCO's construction organization.

3.2.4.3 Contractor Communications with Government Representatives

Whereas it is anticipated that EPC Contractor environmental quality assurance personnel may interact with appropriate representatives from the Republic of Cameroon's administrative supervision and technical inspection organization on an informal, day-to-day basis regarding routine matters, COTCO's construction phase environmental monitoring organization will act as the point of contact for any formal BP/SE/H-related communications with representatives from the Republic of Cameroon. COTCO will be responsible for communicating any pertinent information arising from such discussions to appropriate Contractor personnel.

3.2.5 Cost of Contractors' Construction Phase Environmental Quality Assurance Organizations

The major costs associated with EPC Contractors' construction phase environmental quality assurance/monitoring organizations are related to wages/salaries and benefits and other related costs. Other significant areas of expense include transportation of the organizations' professional staffs and other specialists to and from the field work sites as well as providing the staff with food, housing, office space, and office supplies/equipment (e.g., photocopy machines, computers, telephones). These costs will be borne directly by the Contractors. An estimate of

the costs associated with the EPC Contractors' construction phase environmental quality assurance organizations is provided in Chapter 5.

3.3 COTCO'S PROJECT MANAGEMENT ORGANIZATION

COTCO, with assistance from the Project Management Company (PMC), will manage all aspects of the Project, including those associated with environmental matters, throughout the life of the Project. As management needs change over time, COTCO's management organizations will also evolve to adapt to circumstances. For example, the PMC will play a major role in environmental oversight prior to the construction phase, whereas COTCO will be assisted by the PMC in managing environmental matters during the construction phase. During the operations phase, COTCO will manage environmental matters with limited assistance from the PMC. The following text describes COTCO's pre-construction and construction phase management organizations and the environmental teams within those organizations.

3.3.1 COTCO's Organization Prior to the Construction Phase

The following text describes COTCO's pre-construction organizational structure and attributes, as well as how the organization contributes to the overall environmental management framework for the Project.

3.3.1.1 COTCO's Pre-Construction Phase Organization's Attributes

Prior to the construction phase of the Project, the majority of COTCO's environmental oversight effort will be provided by the PMC under a contractual arrangement. A simplified representation of the PMC's present-day organization associated with the Chad Export Project is shown below:

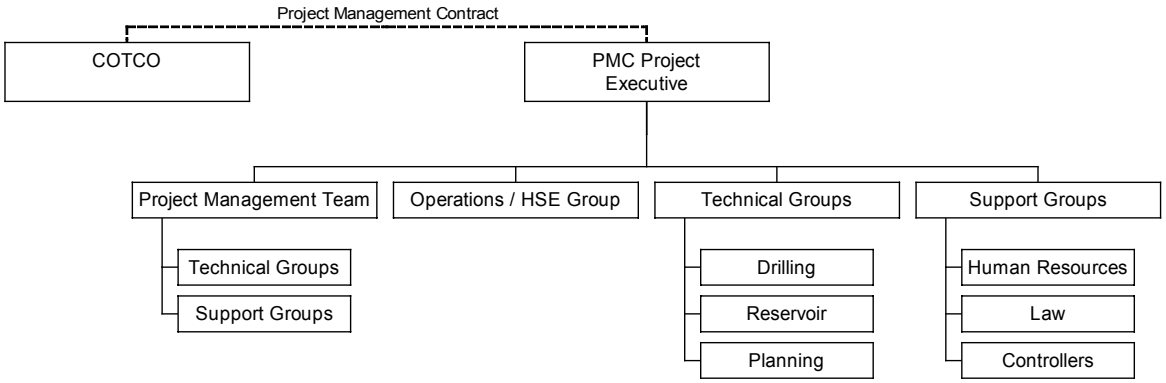

Figure 3.2 PMC's Current Project Management Organizational Structure

This organization has been developed by assembling personnel from various Esso affiliates as a means of capitalizing on Esso/Exxon corporate knowledge and experience.

That part of the current PMC organization that is dedicated to providing project management services to COTCO during the construction phase of the Project is the Project Management Team. This group was created to oversee the planning, engineering, construction, and start-up of the Project and its associated facilities. Although staffing has varied with work activity level, at the peak of preliminary design efforts, this team consisted of over 100 individuals, with approximately 40% of the team being comprised of Esso/Exxon employees. The levels and positions of the Esso/Exxon employees in the Project Management Team were established to maintain strong management control over the strategic aspects of the Project and to assure the required level of quality in the work products generated by contractor staff.

A noteworthy feature of the PMC organization is that it includes an Operations/HSE Group. This group was purposefully established prior to construction in order to assure that learnings and experience arising during the construction phase of the Project are transposed into a knowledgeable, efficient, and effective operating/maintenance organization.

Dedicated environmental staff are assigned to both the Operations/HSE Group and the Project Management Team. In addition, though not explicitly shown in the figure above, the PMC staff includes a medical director, who has primary responsibilities for Project-related health matters.

3.3.1.2 Role of COTCO's Pre-Construction Organization in the Project's Environmental Management Framework

As described at the beginning of this chapter, a key element in COTCO's strategy for managing environmental and socioeconomic affairs related to the Project is the development of a set of environmental requirements, specifications, and procedures with which, as applicable,

Contractors would be contractually bound to comply. Toward this goal, COTCO's pre-construction organization:

- Has developed or is in the process of developing technical requirements and specifications for the construction phase of the Project;
- Has developed or is in the process of developing additional environmental management tools; and
- Will review, upgrade as necessary, and approve of Contractors' environmental plans.

First, with regard to technical requirements and specifications, COTCO devoted and will continue to devote a great deal of time and effort to the preparation of the suite of individual documents that detail the requirements, specifications, and technical expectations for the construction phase of the Project. These requirements, as applicable, were included in the information to potential EPC Contractors, and EPC Contractors that are selected to work on the Project must adhere to the conditions itemized in these comprehensive technical documents.

The purpose of the above-mentioned suite of technical documents is to establish a detailed basis by which construction phase activities (including those dealing directly or indirectly with biophysical, socioeconomic, and health topics) are to be executed. In addition to stipulating numerous technical and engineering details, these documents demonstrate the attention that has been focused on the key biophysical, socioeconomic, and safety/health-related ramifications of the Project. The Project's BP/SE/H-related technical requirements and specifications can be found in Volume 2 of this EMP.

Second, Chapter 7 of this EMP provides an overview of additional environmental management tools corresponding to key work areas/activities that COTCO has developed or is in the process of developing. As an example, a stand-alone Compensation Plan has been drafted to address Project-specific issues in Cameroon. Both this EMP and the management tools will be provided to the Contractors for their use in developing their own environmental management plans.

Finally, as described previously, COTCO will be responsible for reviewing the environmental plans that are to be developed by each major EPC Contractor and with which the specific Contractor will be contractually bound to comply. These plans must be consistent with the requirements and specifications set out for the Project, this EMP, and the operations integrity management system for the Project (see below). A Contractor's work activity will be allowed to commence only after appropriate Contractor environmental plans are in place and approved by COTCO.

3.3.2 COTCO's Construction Phase Project Organization

The following text describes COTCO's construction phase organizational structure, as well as how the organization contributes to the overall environmental management framework for the Project.

3.3.2.1 COTCO's Construction Phase Organizational Attributes and Role in the Project's Environmental Management Framework

As the Project enters the construction phase, COTCO will be assisted by the Project Management Company in supervising all aspects of the Contractor's detailed engineering and design work for the Cameroon Transportation System. As during the pre-construction activity, the core group of the Project Management Company, the Project Management Team, will be staffed such that Esso/Exxon employees maintain strong management control over the strategic aspects of the Project. This group will be staffed to allow for continued close scrutiny of EPC Contractor activities and work products. Multi-disciplinary teams will also be physically located in major EPC Contractor engineering offices to provide continuous, close oversight.

As the Project progresses towards construction activity in the field, a sizable and knowledgeable contingent of staff from the Project Management Company will be transferred into the COTCO organization. Residing in Cameroon, these individuals will perform the primary tasks associated with overseeing and monitoring the in-country activities of EPC Contractors to assure that contractual obligations regarding construction quality, regulatory compliance, environmental protection, and socioeconomic interactions are being satisfied.

The expected COTCO/PMC organization for the construction phase of the Project is shown in the simplified chart below.

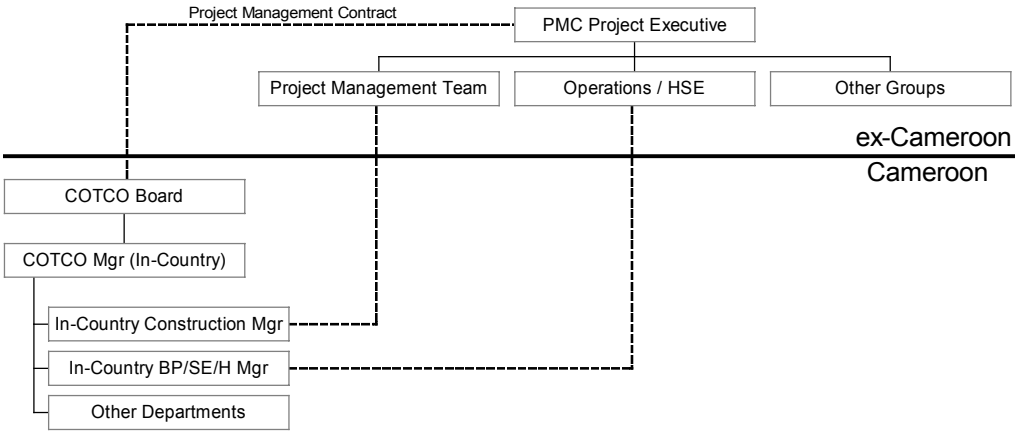

Figure 3.3 The Expected COTCO/PMC Organization for the Construction Phase of the Project

As can be seen in Figure 3.3, the COTCO/PMC construction-phase organization for the Project features environmental professionals within COTCO (stationed in Cameroon) and within the Project Management Company (stationed in the head office, hereafter referred to as “Headquarters"). Within both the COTCO and the PMC organizations, the groups responsible for monitoring BP/SE/H matters will work side-by-side with construction-oriented personnel. However, the construction and environmental groups will report through separate chains of management up to the executive management level in each company.

Although not explicitly shown in the figure, it is expected that PMC Project Management Team and the COTCO Construction Organization staffs will also include environmental professionals. These individuals would be responsible for the implementation of practical HSE solutions, whereas the PMC Operations/HSE Group and COTCO's environmental monitoring organization (headed by the COTCO In-Country BP/SE/H Manager) will be responsible for monitoring construction sites and activities regarding BP/SE/H-related matters.

3.3.2.2 Roles of COTCO's Construction Phase Organization in the Environmental Monitoring

COTCO's construction phase organization will fulfill a principal role in the Project's environmental management framework by monitoring Contractor and COTCO activities to ensure compliance with this EMP and with the Project's environmental requirements and specifications. The roles of the COTCO and PMC groups principally responsible for monitoring environmental performance during the construction phase of the Project are outlined briefly in the text below.

COTCO's In-Country BP/SE/H Manager and environmental monitoring staff will:

- Monitor Contractor and COTCO activities relative to environmental matters on a daily basis and document their observations regarding compliance with Contractor environmental plans, the Project's requirements and specifications, and this EMP;
- Document and report non-compliance situations to the COTCO and PMC environmental managers, to COTCO's In-Country Construction Manger, and to Contractor construction supervisors on site;
- Provide advice to COTCO's In-Country Construction Manager and his/her staff regarding environmental matters;
- Assist COTCO's and Contractors' in-country construction staff in resolving non-compliance situations; and
- Follow up to ensure that non-compliance situations have been successfully addressed by the Contractor (or by COTCO as appropriate).

COTCO's In-Country Construction Manager and staff will:

- Communicate with Contractors' construction organizations and expeditiously resolve non-compliance situations reported by COTCO's environmental monitoring organization or by COTCO's construction organization's staff; and
- Work with Contractors' in-country construction staff and, as necessary, COTCO's environmental monitoring staff to resolve non-compliance situations appropriately and expeditiously.

The PMC's Operations/HSE Group located in the Headquarters office will:

- Provide strategic biophysical, socioeconomic, and health-related technical support to COTCO's In-Country BP/SE/H Manager and staff (e.g., work with the PMC Project Management Team and outside specialists to resolve complex environmental issues);
- Provide advice regarding BP/SE/H matters and/or interpretation of EMP requirements to the PMC Project Executive and to the COTCO In-Country BP/SE/H Manager;
- Review Contractor environmental management plans for consistency with the Project's EMP;
- Assist in the training of COTCO's environmental monitoring personnel in order to ensure consistency in monitoring approaches;
- Work with the PMC Executive and the PMC Project Management Team to resolve any BP/SE/H-related compliance issues that cannot be resolved by COTCO personnel in Cameroon; and

- Conduct periodic audits of the environmental performance of EPC Contractors and of COTCO.

Because of the key role that COTCO's In-Country BP/SE/H Manager and his/her staff will play regarding the monitoring of the activities of EPC Contractors, the organization of this group and the individual roles and responsibilities within it are presented in greater detail in the following section.

3.4 COTCO'S ENVIRONMENTAL MONITORING ORGANIZATIONS

This section provides an overview of COTCO's BP/SE/H oversight organizations for the construction and operations phases of the Project. Although the focus of this section is on the environmental professionals in these organizations, environmental oversight is part of every Project worker's job, with line management ultimately bearing the responsibility for results. Project workers will be provided with appropriate training regarding key environmental issues and requirements so that they can become an effective extension of the EPC Contractors' and COTCO's environmental oversight organizations.

3.4.1 COTCO's Environmental Monitoring Organization: Construction Phase

3.4.1.1 In-Country Environmental Monitoring Organization

As is indicated in Figure 3.3, COTCO will support an in-country environmental monitoring organization alongside its construction organization. COTCO's environmental monitoring organization during the peak of construction is depicted below in Figure 3.4:

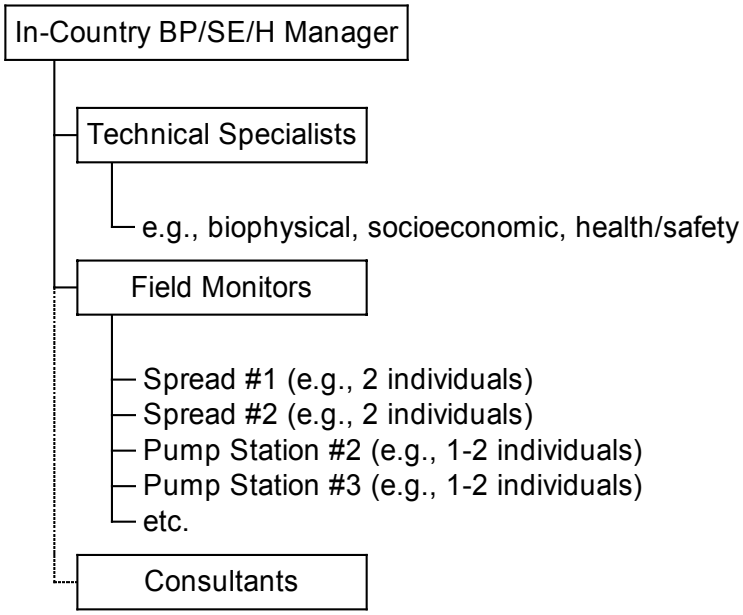

Figure 3.4 The Expected Structure of COTCO's In-Country Construction Phase Environmental Monitoring Organization

During the construction phase of the Project, COTCO's In-Country BP/SE/H Manager will deploy his/her staff based on the level and type of construction activities that are in progress and their associated environmental sensitivities. It is expected that two environmental field monitors may be required to monitor each pipeline spread at most times, whereas two monitors may be required at a Pump Station location only during critical steps in the construction process. A small professional staff of technical specialists will assist COTCO's In-Country BP/SE/H Manager in coordinating the efforts of the field environmental monitors and resolving special problems.

At the peak of construction, COTCO's in-country construction phase environmental monitoring organization is currently expected to feature a staff of 10-15 professionals, with the majority of this staff providing actual monitoring services in the field. These personnel expectations include only the COTCO individuals solely focused on monitoring environmental and socioeconomic matters. Not included in this total are:

- The COTCO Medical Director and his/her staff, who will help in identifying and rectifying health issues at camps, etc.;
- Community liaisons (likely 8-10), who are an integral part of the consultation and socioeconomic monitoring process, and other professionals dealing with compensation and Project land use issues;

- HQ-based PMC environmental specialists that will be called in periodically to address various issues on an as-needed basis (see the Section 3.3.2);
- Independent consultants and specialists; and
- Environmental quality assurance personnel and other specialists assigned by the various EPC Contractors (see Section 3.2.2).

The staffing of COTCO's in-country construction phase environmental monitoring organization will be commensurate with the work demands. For example, the implementation of this organization will be staged in recognition of the staged nature of the Project's construction activities. Once reaching the expected peak staffing level of 10-15 individuals, the environmental monitoring professional staff is expected to remain at that level until construction activities begin to wane. At that point, the monitoring organization will be pared down to an organization more suitable to monitoring operations phase activities.

3.4.1.2 Roles and Responsibilities of the Individuals Assigned to COTCO's Construction Phase Environmental Monitoring Organization

COTCO's construction phase environmental monitoring organization will be responsible for interfacing with other COTCO and PMC groups so that Project-related environmental issues can be properly managed. In addition, COTCO's environmental monitoring organization will furnish the Republic of Cameroon's administrative supervision and technical inspection organization with required/requested environmental-type information.

The responsibilities of COTCO's **In-Country BP/SE/H Manager** are as follows:

- Coordinate COTCO's overall environmental monitoring effort for the Project and ensure that Contractors are complying with contractual requirements, their environmental plans, the Project's BP/SE/H-related technical requirements and specifications, and this EMP;
- Provide advice to COTCO's In-Country Construction Manager with regard to BP/SE/H-related matters;
- Participate in the selection of COTCO's environmental monitoring staff;
- Supervise the work of COTCO's environmental monitoring staff by coordinating assignments/workloads, advising on complex issues, and periodically visiting field locations to ensure monitoring quality;
- Coordinate BP/SE/H-related activities in response to routine or emerging issues;
- Call in inspectors/specialists to consult on special problems or to conduct inspections as needed;

- Keep COTCO management and the PMC Operations/HSE Group informed regarding the status of environmental compliance as well as emerging BP/SE/H issues through verbal reports, informal written reports, or periodic formal reports as appropriate;
- Communicate, via the In-Country Construction Manager, with Contractors regarding non-compliance situations and other situations as necessary; and
- Communicate with environmental representatives from the Republic of Cameroon's administrative supervision and technical inspection organization as required on all Project-related BP/SE/H matters.

COTCO's In-Country BP/SE/H Manager will be assisted in his/her job duties by COTCO's environmental monitoring staff. In addition, support staff will provide word processing, filing, and other clerical support services to COTCO's In-Country BP/SE/H Manager and his/her professional staff.

COTCO's **Environmental Monitoring Staff** will include both staff specialists/coordinators and field monitors. COTCO's environmental monitoring staff will have the following general responsibilities:

- Coordinate COTCO's on-the-ground environmental monitoring activities and function as COTCO representatives at the field level regarding BP/SE/H matters;
- Provide advice to COTCO's construction organization representatives with regard to BP/SE/H-related matters;
- Work with Contractor environmental quality assurance personnel, including overseeing work, conducting inspections, and reviewing compliance and inspection reports;
- Communicate the results of inspections to appropriate individuals/offices *via* transmittal of copies of original reports, summaries of reports, or periodic formal and informal reports as appropriate;
- Communicate with COTCO management and PMC Operations/HSE personnel regarding emerging BP/SE/H-related issues and areas of concern; and
- Communicate with Contractors regarding environmental compliance issues.

With regard to biophysical matters, COTCO's environmental monitoring staff will:

- Conduct on-the-ground assessments and inspections to ensure compliance with applicable Republic of Cameroon regulations concerning biophysical issues, contractor environmental plans, the Project's biophysical-related requirements and specifications, and this EMP;
- Observe Contractor site clearing activities, construction activities, erosion control/mitigation practices, and site reclamation activities;

- Monitor waste water treatment and solid waste management facilities and observe Contractor waste handling practices;
- Monitor surface water withdrawal practices and pipeline hydrotesting effluent discharges;
- Communicate through verbal and written reports to appropriate COTCO and PMC Operations/HSE managers regarding non-compliance situations and other areas of concern;
- Monitor Contractor training programs with respect to biophysical issues; and
- Provide advice to Contractor field personnel concerning biophysical matters and the interpretation of the Project's biophysical requirements and specifications.

With regard to socioeconomic matters, COTCO's environmental monitoring staff will:

- Conduct on-the-ground assessments and inspections to ensure compliance with applicable Republic of Cameroon regulations concerning socioeconomic issues, Contractor environmental plans, the Project's socioeconomic-related requirements and specifications, and this EMP;
- Monitor construction activities regarding socioeconomic issues and potential impacts;
- Monitor Contractors' local hiring practices and local purchasing practices;
- Monitor the Project's compensation program;
- Review activity schedules and assist in communicating pertinent information to local communities and transhumants so that adjustments to lifestyle patterns can be made and conflicts/disruptions can be avoided or limited;
- Contact and work with appropriate parties when sacred sites or significant archaeological or paleontological sites are discovered during construction activities;
- Communicate through verbal and written reports to appropriate COTCO and PMC Operations/HSE managers regarding socioeconomic issues and areas of concern;
- Monitor Contractor training programs with respect to socioeconomic issues; and
- Provide advice to Contractor field personnel concerning socioeconomic matters and the interpretation of the Project's socioeconomic requirements and specifications.

With regard to health matters, COTCO's environmental monitoring staff will:

- Conduct on-the-ground assessments and inspections to ensure compliance with applicable Republic of Cameroon regulations concerning health issues, the Project's health-related requirements and specifications, and this EMP;
- Monitor construction activities regarding health issues and potential impacts, including the effectiveness of EPC Contractors' dust control programs;

- Communicate through verbal and written reports to appropriate COTCO and PMC Operations/HSE managers and the COTCO Medical Director regarding health issues and areas of concern;
- Monitor Contractor training programs with respect to health issues;
- Provide advice to Contractor field personnel concerning health matters and the interpretation of the Project's health requirements and specifications; and
- Coordinate with local and regional public health facilities and organizations regarding the community health outreach program.

More detail concerning the actual activities of the COTCO environmental monitoring group personnel during the construction phase of the Project is presented in the Environmental Monitoring Plan (Appendix G of Volume 1 of this EMP).

3.4.1.3 Flow of Information Regarding Environmental Matters During the Construction Phase of the Project

To successfully manage environmental matters during the construction phase of the Project, effective communications between the various organizations monitoring the environmental aspects of the construction activities will be essential. The following text overviews the typical flow of environmental performance-related information that will occur during the construction phase of the Project.

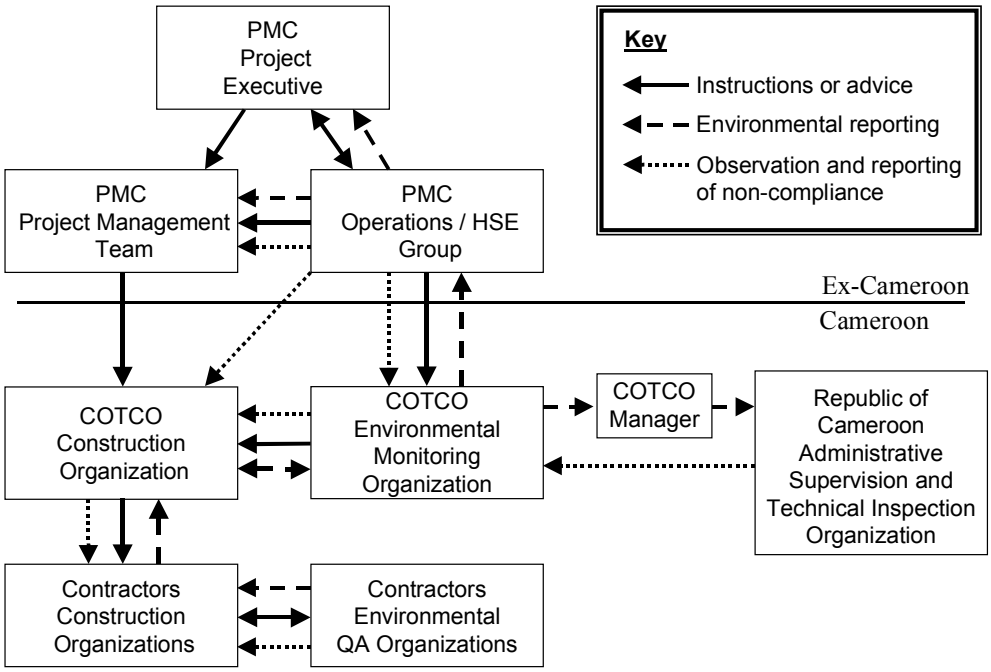

Figure 3.5 Primary Formal Paths of Environmental Information Flow, as Distinguished from Communications, During the Construction Phase of the Project

The flow of environmental performance-related information, including the reporting and resolution of non-compliance situations, during the construction phase of the Project is depicted in Figure 3.5. The arrows in the figure indicate only the primary formal paths of environmental information flow, as distinguished from communication paths. Informal and formal two-way communications between all of the parties are expected to occur on a regular basis, and it is expected that discussion between several of the groups may be required to resolve certain situations. Several typical information flow scenarios are listed below.

- COTCO's environmental monitoring organization will be the central focus/clearinghouse for environmental performance information related to the Project. This organization will receive information from Contractors' environmental quality assurance organizations, the Republic of Cameroon's administrative supervision and technical inspection organization, and its own field environmental monitors. On a regular basis, COTCO's environmental monitoring organization will summarize information/reports concerning environmental performance and will communicate these data to the Operations/HSE group of the PMC. Based on these data, the PMC's Operations/HSE group will provide regular reports to the PMC Project

Manager and the PMC Project Executive regarding the Project's environmental performance.

- If complex environmental issues/situations arise, COTCO's environmental monitoring organization may seek advice from the PMC's Operations/HSE group. The PMC's Operations/HSE group will then interact with the PMC Project Management Team and, on occasion, the Project Executive to appropriately resolve such issues/situations.
- On a routine basis and in special cases where non-compliance trends or emerging issues are recognized, COTCO's environmental monitoring organization will communicate with COTCO's construction organization regarding Contractors' environmental performance and any non-compliance situations. COTCO's construction organization will be the point of contact for COTCO's communications with EPC Contractors' construction organizations, but COTCO's environmental monitoring organization will often join COTCO's construction organization in discussions with Contractors' construction organizations to resolve problems.
- In the case that a non-compliance situation is discovered, a Contractor field environmental quality assurance monitor would communicate directly to the Contractor's site construction supervisor, who will be responsible for rectifying the situation in an appropriate and expeditious manner. All such observations will also be reported to COTCO's construction organization via the Contractor construction organization. COTCO's construction organization will forward such reports to COTCO's environmental monitoring organization.
- In some cases, a COTCO environmental field monitor may be the first to observe a non-compliance situation. In this case, the COTCO field environmental monitor will communicate to formally to the COTCO site construction representative, who will be responsible for communicating with the Contractor's site construction supervisor. Subsequently, the COTCO field environmental monitor and site construction representative will report the situation, respectively, to COTCO's In-Country BP/SE/H Manager and In-Country Construction Manager.
- In the case that a non-compliance situation is noted during a periodic audit conducted by PMC Operations/HSE personnel or their representatives, reporting of the observation will be made to the COTCO's In-Country BP/SE/H and In-Country Construction Managers, as well as the PMC Project Manager.
- In the case that a field monitor from the Republic of Cameroon's administrative supervision and technical inspection organization observes a non-compliance situation, the individual would discuss the situation informally with the COTCO site construction representative and, as available, the COTCO environmental field monitor. A formal report of this information will be communicated to the COTCO Environmental Monitoring Organization, which will evaluate the information and relay it to the COTCO construction organization for resolution with the EPC Contractor as appropriate.

- Periodically, COTCO's In-Country Manager will provide reports on environmental compliance to the Republic of Cameroon's administrative supervision and technical inspection organization.

3.4.1.4 Construction Phase Interactions Between the Republic of Cameroon's Administrative Supervision and Technical Inspection Organization and COTCO's Environmental Monitoring Organization

Communications between the Republic of Cameroon's administrative supervision and technical inspection organization and COTCO's environmental monitoring organization regarding environmental matters during the construction phase of the Project will occur through a variety of mechanisms including written reports and memos, as well as informal and formal meetings. Meetings will include regularly scheduled sessions as well as other meetings called on an as-needed basis. At the field level, formal meetings with environmental monitors from the Republic of Cameroon's administrative supervision and technical inspection organization will be held frequently to discuss scheduling/planning issues, current areas of concern, and emerging BP/SE/H issues.

At the management level, formal meetings will be regularly scheduled, but on a less frequent basis. Informal meetings and communications will also occur as necessary. With respect to formal meetings, COTCO's In-Country BP/SE/H Manager will meet with his/her respective counterparts in the Republic of Cameroon's administrative supervision and technical inspection organization to review BP/SE/H performance based on reports from the field, to consider plans for upcoming work and coordination issues, and to resolve any issues that could not be resolved at the field level.

3.4.1.5 Cost of COTCO's Construction Phase Environmental Monitoring Organization

The major costs associated with COTCO's construction phase environmental monitoring organization are related to wages/salaries and benefits and other related costs. Other significant areas of expense include transportation of the organization's professional staff and other specialists to and from the field work sites as well as providing the staff with food, housing, office space, and office supplies/equipment (e.g., photocopy machines, computers, telephones). These costs will be borne by COTCO. An estimate of the costs associated with COTCO's construction phase environmental monitoring organization is provided in Chapter 5.

3.4.2 COTCO's Environmental Monitoring Organization: Operations Phase

3.4.2.1 Staffing and Organization

Because activity levels are expected to substantially decrease during the operations phase relative to the construction phase, a smaller organization will be needed by COTCO for overall

environmental monitoring purposes. Consequently, the staffing level of COTCO's environmental monitoring organization will be reduced as construction activity wanes.

In transitioning from a large construction monitoring organization to a smaller operating/maintenance monitoring organization, BP/SE/H-related plans and procedures from the construction phase of the Project will be modified for use during the operations phase. It is anticipated that many of the day-to-day, routine field environmental monitoring activities will be incorporated into the job duties of selected on-site operations/maintenance personnel, with 2-3 in-country environmental professionals coordinating and overseeing this work, as well as performing more specialized environmental duties. For example, these environmental professionals will undertake periodic internal assessments to monitor compliance with the Project's management plans and will also work with their counterparts in the Headquarters office to address more complicated environmental issues. Project-related BP/SE/H planning, coordination, consulting, and analysis activities will be provided by a Headquarters-based environmental team.

As required, operations phase environmental monitoring professionals will draw on outside expertise to provide assistance in special situations. Depending on activity levels and circumstances, 0.5 - 3 workyears per year of additional effort is expected to supplied by these personnel.

3.4.2.2 Operations Phase Interactions Between the Republic of Cameroon's Administrative Supervision and Technical Inspection Organization and COTCO's Environmental Monitoring Organization

During the operations phase of the Project, communications and interactions between the Republic of Cameroon's administrative supervision and technical inspection organization and COTCO's environmental monitoring organization will occur at all levels, from the field level to the General Manager level. In general, communications from COTCO's environmental monitoring organization will be directed to the corresponding professional(s)/supervisor(s) in the Republic of Cameroon's administrative supervision and technical inspection organization and *vice versa*. These communications will occur through telephone/fax discussions, written reports and memos, and informal and formal meetings.

At the field level, environmental monitors of the Republic of Cameroon's administrative supervision and technical inspection organization will inform appropriate COTCO representatives if non-compliance situations arise.

At the management level, regularly scheduled meetings will occur between COTCO's environmental monitoring professional staff and appropriate representatives of the Republic of Cameroon's administrative supervision and technical inspection organization to review environmental performance, areas of concern, and emerging issues.

3.4.2.3 Cost of COTCO's Operations Phase Environmental Monitoring Organization

As was the case during the construction phase of the Project, the major operations phase costs associated with COTCO's environmental monitoring organization are related to wages/salaries and benefits and other related costs. Other significant costs will include the provision of transportation, food and lodging, office space, office supplies, and office equipment to in-country environmental monitoring professionals. These costs will be borne by COTCO.

Annual wages/salaries and benefits-related costs for COTCO's operations phase environmental monitoring efforts are expected to be less than $US 0.5 million per annum (300 million FCFA per annum).

3.4.3 Equipment Needs and Associated Costs for COTCO's Environmental Monitoring Organizations

The equipment and other physical needs of COTCO's Environmental Monitoring Organizations (i.e., construction phase and operations phase) include the use of:

- Motor vehicles in the field;
- Desktop personal computers, with associated printers;
- Notebook computers for in-field use;
- Office space;
- Periodic use of aircraft and/or ground vehicles to perform pipeline surveillance; and
- Environmental field measurement kits.

COTCO's construction phase environmental organization's needs regarding these items will require incremental expenditures in these areas approaching $US 250,000 (150 million FCFA). Contractor resources in these areas will also be leveraged where/when possible.

3.5 PROJECT MANAGEMENT FRAMEWORK

COTCO will utilize the following management processes and systems to oversee the environmental aspects of the Project's activities:

- Environmental Management Framework;
- Operations Integrity Management System (OIMS); and
- Change Management System.

Adherence to these processes and systems will help ensure achievement of the Project's overall environmental goals.

The earlier parts of this Chapter described COTCO's Environmental Management Framework in detail (see Section 3.1 for an overview). The following text describes the Operations Integrity Management and Change Management Systems.

3.5.1 Operations Integrity Management System

COTCO will base its Project Management Framework on an Operations Integrity Management System that is compatible with that developed by Exxon Corporation.

In 1992, Exxon Corporation instituted an Operations Integrity Management Framework to systematically identify and implement ways to improve procedures and practices dealing with biophysical, health, and safety performance throughout the Corporation.

The Operations Integrity Management Framework was brought into the mainstream of the Corporation's facilities and operations worldwide *via* the development of a standard Operations Integrity Management System (OIMS). Quite simply, OIMS is a structured process aimed at preventing operational incidents and reducing biophysical, safety, and health risks. It is the opinion of Lloyd's Register Quality Assurance (opinion published on January 31, 1998) that the environmental management components of Exxon's Operations Integrity Management System are consistent with the intent and meet the requirements of the ISO 14001 Environmental Management Systems Standard.

OIMS is composed of a number of components that are organized according to the following hierarchy:

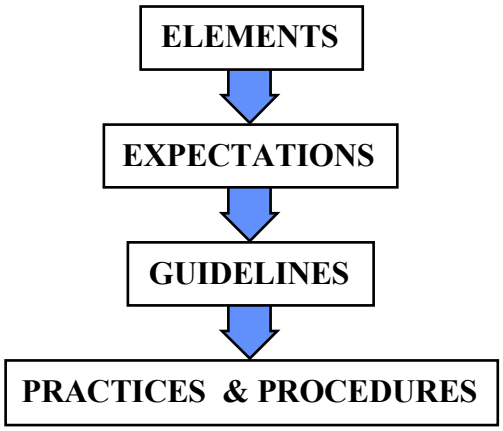

Figure 3.6 Hierarchy of OIMS Components

As one moves down this hierarchy, greater definition occurs as to the type and nature of activities that must be conducted to fulfill the goals of OIMS.

Eleven elements constitute the cornerstone of the Corporate version of OIMS. These are listed below together with their key activity focus areas:

- Element 1 Management Leadership, Commitment, and Accountability
  - Establish procedures for implementing and managing OIMS;
  - Establish roles, responsibilities, authorities, and accountabilities within OIMS;
  - Establish goals and objectives for OIMS;
  - Establish processes for ensuring active employee participation in OIMS; and
  - Establish procedures for assessing how well expectations are met.
- Element 2 Risk Assessment and Management
  - Identify hazards and assess the likelihood of occurrence;
  - Evaluate measures to prevent or reduce the impacts of hazards; and
  - Follow-up on recommendations to ensure they are implemented.
- Element 3 Facilities Design and Construction
  - Ensure that sound management methods are in place;
  - Ensure that risk assessments are conducted at specific Project stages;
  - Design and construct facilities that comply with applicable laws and regulations;
  - Ensure that responsible requirements are created where regulations do not exist;
  - Ensure that quality control and inspection procedures exist; and
  - Perform reviews throughout the life of a facility/operation to confirm that adequate biophysical, safety, and health procedures are in place.
- Element 4 Information/Documentation
  - Ensure that needed technical drawings and documents are identified, available, and current;
  - Ensure that potential hazards associated with materials involved in operations are identified, documented, and known to the people who will be dealing with them; and
  - Ensure that regulations, permits, codes, standards, and practices are documented and understood by those affected.
- Element 5 Personnel and Training

- Ensure the selection and placement of qualified employees;
- Ensure employees are trained to meet job and legal requirements;
- Ensure employees are trained to protect their health and safety;
- Ensure employees receive refresher training to maintain skills and knowledge; and
- Provide feedback on employee performance.

- Element 6 Operations and Maintenance
  - Assure that procedures exist and are updated at specified times;
  - Assure that work permit systems are in place;
  - Assure that alarm, control, and shutdown systems are identified, tested, and maintained;
  - Ensure that higher risk operations are managed with special procedures;
  - Ensure that emissions and wastes are properly tracked and managed;
  - Ensure that applicable laws, regulations, and permit requirements are met; and
  - Ensure that the abandonment of facilities is handled responsibly.
- Element 7 Management of Change
  - Ensure that procedures to effectively manage change exist; and
  - Ensure that procedures to respond to changes in laws and regulations exist.
- Element 8 Third Party Services
  - Establish procedures for evaluating and selecting services which include assessing the ability of the contractor or vendor to perform in a safe and environmentally sound manner;
  - Establish performance requirements and self-monitoring procedures that are clearly understood by third parties;
  - Establish a system that ensures effective communications between organizations providing and receiving services; and
  - Establish procedures to monitor and assess third party performance.
- Element 9 Incident Investigation and Analysis
  - Establish systems for reporting, investigating, analyzing, and documenting biophysical, health, safety, and regulatory compliance incidents as well as significant “near misses”;

- Establish processes for analyzing and reporting incident findings; and
- Establish procedures for ensuring lessons learned from incidents and "near misses" are shared with organizations that may benefit.

- Element 10 Community Awareness and Emergency Preparedness
  - Establish a system that recognizes and responds to community expectations and concerns about the Corporation's operations;
  - Establish emergency response plans that are documented, accessible, and clearly communicated;
  - Ensure that equipment, facilities, and trained personnel are available to respond to emergencies; and
  - Conduct emergency response simulations and drills.
- Element 11 Operations Integrity Assessment and Improvement
  - Ensure that operations undergo OIMS assessments at predetermined times;
  - Ensure that OIMS assessments are conducted by trained teams from a variety of organizations and affiliates; and
  - Ensure that observations and learnings from OIMS assessments are reviewed and implemented.

Within the standard Exxon Corporation version of OIMS, some sixty expectations have been defined, and all of these will be adopted by COTCO for the Project. OIMS-compliant guidelines and practices/procedures continue to be developed at the Project level so as to make particular actions relevant to Project-specific situations and circumstances.

Individual Project documents contain or reference various plans, procedures, activities, instructions, standards, manuals, etc. that are needed to define and achieve specific objectives and to contribute to the prudent management of the Project. Overall, the comprehensive nature of these guidelines and practices/procedures will allow COTCO to efficiently and effectively steward the Cameroon Transportation System through its evaluation, design, engineering, procurement, construction, start-up/commissioning, operations, and decommissioning phases. It is worthy to note that the Project's technical requirements and specifications which Contractors must adhere to during the Engineering, Procurement, and Construction portion of the construction phase of the Project were drafted to be in compliance with OIMS.

3.5.2 Change Management System

Among the 11 elements of the Operations Integrity Management System that was outlined above, the element focusing on the management of change has been acknowledged as having

particular importance to the Project. As is the case with any major natural resource development project, change will be an ever-present feature of the Project. It was recognized early on in the Project's planning phase that a systematized approach regarding change management would be essential to the overall success of the Project, for without it, Project changes could prove to be a disruptive force within the venture. In recognition of this, a discrete set of change management procedures that meet OIMS requirements has been developed by COTCO. The objectives of these procedures are to:

- Effectively manage change to minimize risk and improve business performance;
- Control Project changes in total by eliminating non-essential changes and minimizing changes after a control basis has been set, especially during detailed engineering and construction;
- Ensure that approved changes are implemented, widely communicated, and closed- out on a timely basis. Close-out includes documentation and establishing a permanent record;
- Establish a separate but linked change process within each outside contract for control of changes against the contract, wherein the contractor will be required to assess the risk associated with changes;
- Manage temporary and urgent changes within the overall change process; and
- Identify deviations to the Project which are different than what may have originally been planned, documented, or assumed but are not considered changes to a Project baseline (e.g., adverse price trends).

These objectives will be realized *via* adherence to a formalized change management process. A schematic diagram outlining the Change Management Process that COTCO will use during the construction phase of the Project appears below:

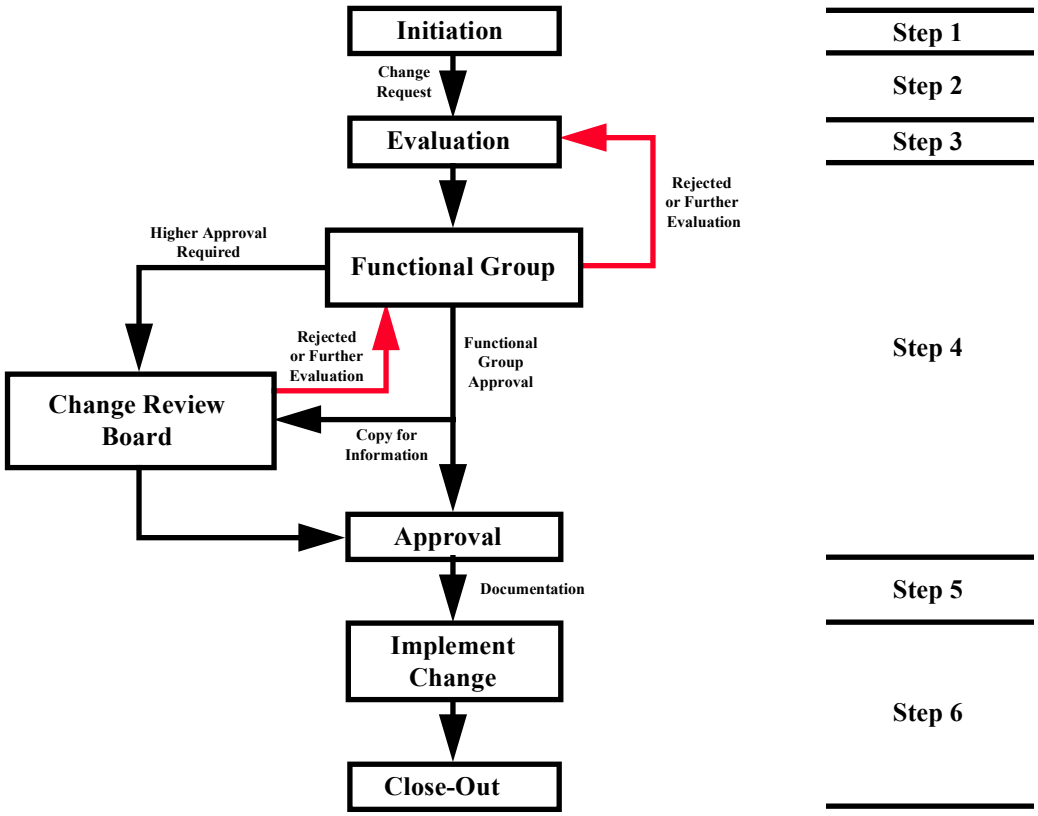

Figure 3.7 COTCO's Construction Phase Change Management Process and Steps

As can be seen in Figure 3.7, the essential steps of COTCO's Change Management Process are:

1. Identification of an item/situation potentially requiring some type of change;
2. Preparation of a Change Request Document that:
   - Outlines the nature of the item/situation requiring a change;
   - Presents a justification for the change;
   - Outlines impacts of the change (e.g., cost, schedule, safety, operability);
   - Identifies potential biophysical, socioeconomic, or health concerns; and
   - Estimates personpower and financial requirements to effect the change.
3. Quick evaluation by appropriate individual(s) to determine whether resources should be devoted to further progressing the change request (i.e., mechanism to filter out proposals of limited merit);

4. Formal assessment and review of the change request, including:
   - A preliminary assessment at the functional group level;
   - A review for compatibility with the Environmental Management Plan and identification of modifications if appropriate; and
   - A subsequent assessment by a Change Review Board where higher approval authority is required.
5. Documentation of the approval or rejection of the change request; and
6. Implementation of an approved change, including communication to appropriate parties concerning the nature, scope, and timing of the change.

The Change Management Process's written procedures require that health, safety, socioeconomic, and biophysical issues be addressed prior to the approval of any change.

EPC Contractors will be required to devise their own change management procedures that are in harmony with those of COTCO. Contractor change management procedures will also require that biophysical, socioeconomic, and health considerations be factored into the approval of changes.

With regard to this EMP, it is not expected that there will be need to change the intent of the commitments made herein. However, the means specified to achieve certain levels of protection might be subject to correction or amendment via the process specified above. Changes that would materially adversely affect the level of protection afforded by this EMP will be reviewed and approved in collaboration with the Republic of Cameroon.