NAC Executive Insights

Quality
November 1, 2021

Continuous Performance Improvement: Detailed Work Processes – Do

Key Points

- Addresses the Do stage of Continuous Performance Improvement, the second stage in a Plan-Do-Check-Act cycle, to be used in conjunction with companion Executive Insights examining the other stages of CPIP.
- Details the Do stage as comprised of five principal processes: asset integrity, commodity movement, business risk, commercial development, and management, which can be customized based on industry and company needs.
- Provides flow charts with a clear guide to each process and a starting point for adaptation and implementation.

Introduction

This Executive Insight provides a detailed look at the Do stage of Continuous Performance Improvement Processes, complemented by a series of Executive Insights providing flow charts for each of the various processes employed as part of a Plan-Do-Check-Act system. These Executive Insights reflects the author's experience both in industry executive roles as well as consulting in this area.

This Executive Insight examines:

- Asset Integrity Process
  - Design (Figure 1A)
  - Build (Figure 1B)
  - Maintain (Figure 1C)
- Commodity Movement Process
  - Defining Operating Limits (Figure 2A)
  - Operate, Monitor and Control (Figure 2B)
  - Schedule Movements, Maintenance, Prevention, and Mitigation (Figure 2C)
  - Manage Incidents (Figure 2D)
- Business Risk Management System (Figure 3A)
- Commercial Development Process (Figure 4A)
- Management Sub-systems
  - Operation (Figure 5A)

- Technology (Figure 5B)
- Security Management System (Figure 5C)
- Stakeholder Relations Process (Figure 5D)

Do

The Do phase of continuous performance improvement incorporates five principal management systems that encompass 13 distinct processes, illustrated by the flow charts in this Executive Insight.

The **Asset Integrity Process** consists of separate sub-processes covering the design, build, and maintain phases of an asset, detailed in Figures 1A through 1C.

- The Design phase begins with a clear definition of performance expectations which are reviewed and tested against identified regulatory requirements. The results of these activities are translated into complete specifications. Caution is urged as complete scope and specifications are required to deliver the requisite outcomes successfully. The design process is focused on delivering assets that meet these specifications. These outcomes are reflected in design drawings or BIM models, which are verified for correctness.
- In the Build phase, permits and qualified contractors are obtained. Figure 1B reflects the associated bidding and contracting activities as well as dealing with unsatisfactory performance. Acceptance tests and startup activities are reflected in this process description. The completed project is documented and often the final as-built BIM model serves as a facility management baseline as part of a broader enterprise asset management system. Attention is called to the two parts which comprise Figure 1B.
- The Maintain phase of asset integrity is reflected in Figure 1C and covers the operating life of the developed facility. Documented maintenance activities and any facility modifications would be reflected in an updated facility management baseline and any associated enterprise asset management system.

The **Commodity Movement Process** reflects the author's experience in the pipeline sector. Commodity movements are not limited to that sector, however, and analogous processes can be constructed for the minerals and natural resources sectors. Commodity movements encompass four major sub-processes that are detailed in Figures 2A through 2D. Figure 2B's focus on Operate, Monitor, and Control are broadly applicable and can serve as a good analog for more traditional logistics activities. The Management Incidents process is applicable across industries and both public and private organizations.

The **Business Risk Management System** is illustrated in Figure 3. Unlike many business risk processes, the approach described considers not just risks but also opportunities. The process encompasses assessment, implementation, and identification and documentation of lessons learned. Interfaces with the Asset Integrity process are highlighted.

The **Commercial Development Process** begins with reviewing performance expectations and developing a marketing plan. Commercial contracts are put in place and progress monitored on the subsequent implementation plan. Assets that are developed are transferred to operations. Figure 4 (parts 1 and 2) provides for addressing unsuccessful progress as well.

Management Sub-systems are illustrated in Figures 5A through 5D, which include Operations, Technology, Security, and Stakeholder Relations. The rigors with respect to the technology sub-process

are even more important as new technologies like artificial intelligence and challenges such as cybersecurity become more common.

Conclusion

The 13 processes that comprise the Do stage of Continuous Performance Improvement Processes provide a ready starting point for organizations. These are broadly applicable and can be modified to reflect specific industry and company needs. Companion Executive Insights describe the Plan, Check, and Act stages of Continuous Performance Improvement.

Figure 1A

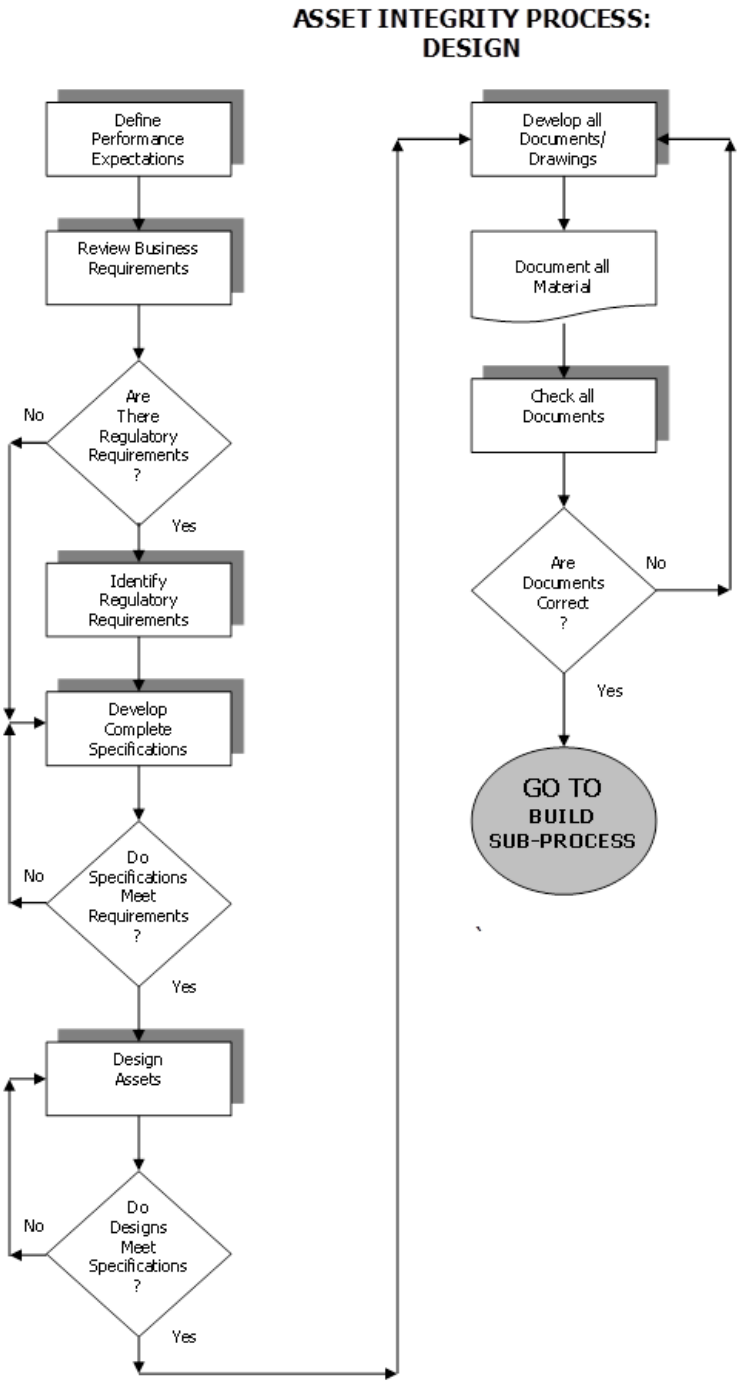

ASSET INTEGRITY PROCESS:
DESIGN
Define Performance Expectations
Review Business Requirements
Are There Regulatory Requirements ?
No
Yes
Identify Regulatory Requirements
Develop Complete Specifications
Do Specifications Meet Requirements ?
No
Yes
Design Assets
Do Designs Meet Specifications ?
No
Yes
Develop all Documents/ Drawings
Document all Material
Check all Documents
Are Documents Correct ?
No
Yes
GO TO BUILD SUB-PROCESS

Figure 1B

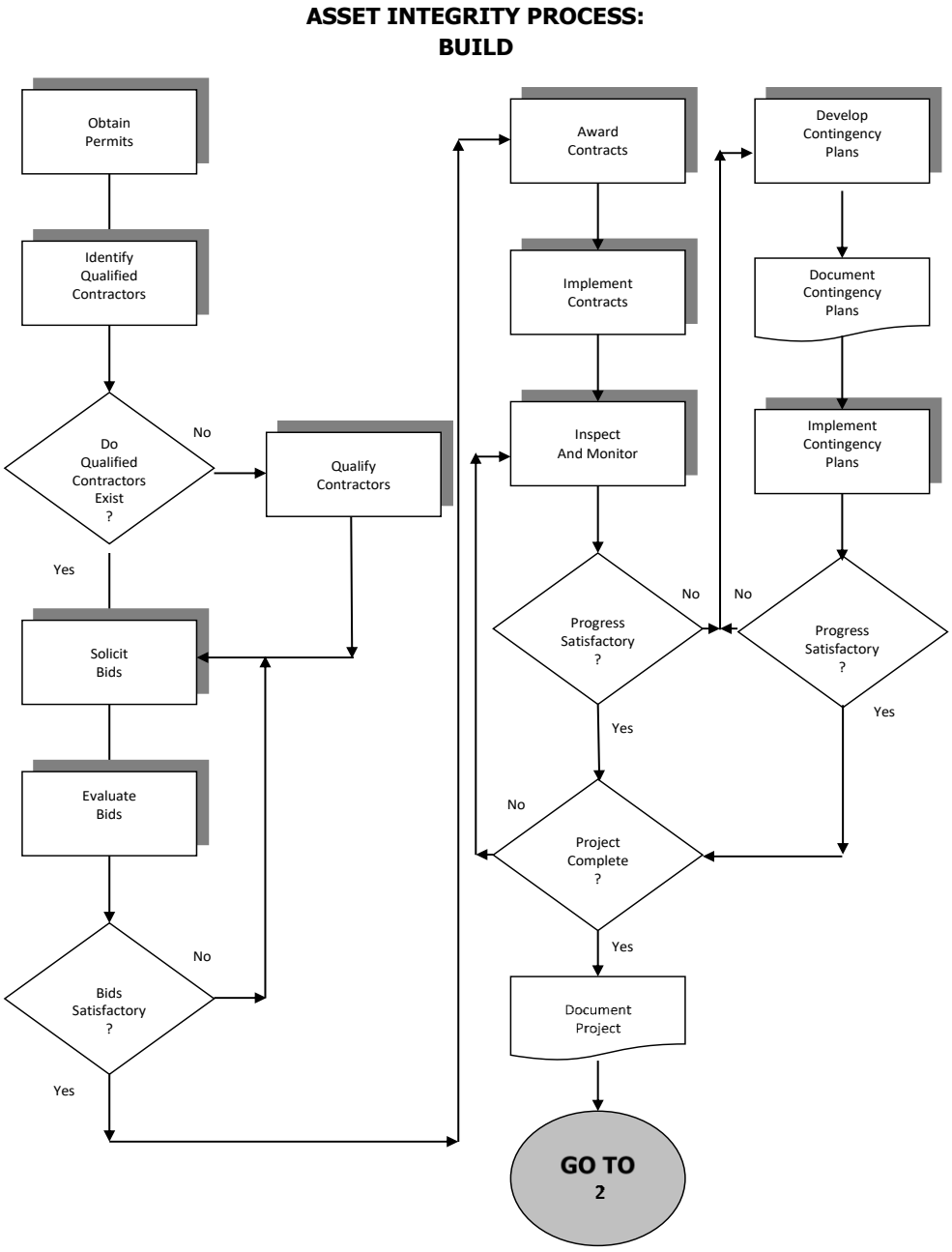

ASSET INTEGRITY PROCESS:
BUILD
Obtain Permits
Identify Qualified Contractors
Do Qualified Contractors Exist ?
No
Qualify Contractors
Yes
Solicit Bids
Evaluate Bids
Bids Satisfactory ?
No
Yes
Award Contracts
Implement Contracts
Inspect And Monitor
Progress Satisfactory ?
No
Yes
Project Complete ?
No
Yes
Document Project
GO TO 2
Develop Contingency Plans
Document Contingency Plans
Implement Contingency Plans
Progress Satisfactory ?
No
Yes

Figure 1B

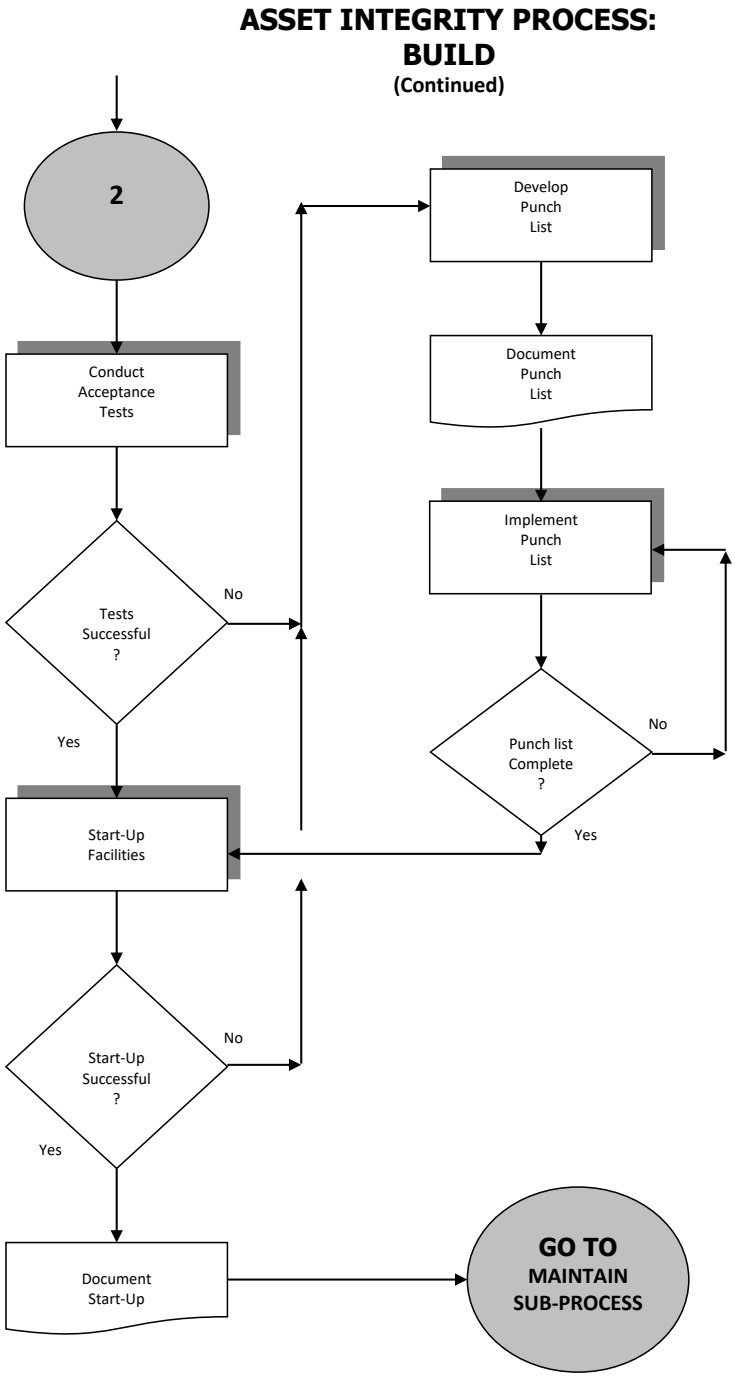

ASSET INTEGRITY PROCESS:
BUILD
(Continued)
2
Develop Punch List
Document Punch List
Conduct Acceptance Tests
Implement Punch List
Tests Successful ?
No
Yes
Punch list Complete ?
No
Yes
Start-Up Facilities
Start-Up Successful ?
No
Yes
Document Start-Up
GO TO MAINTAIN SUB-PROCESS

Figure 1C

ASSET INTEGRITY PROCESS:
MAINTAIN

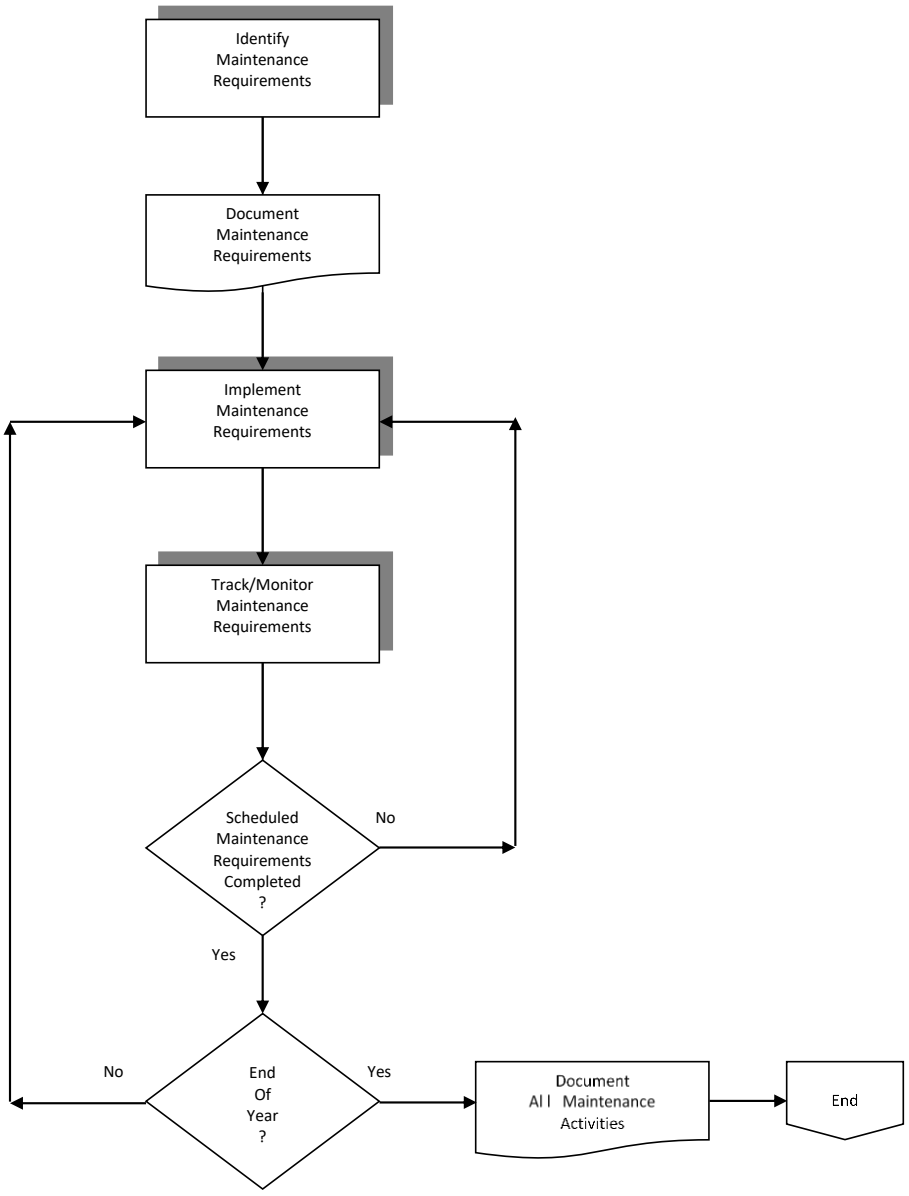


Figure 2A

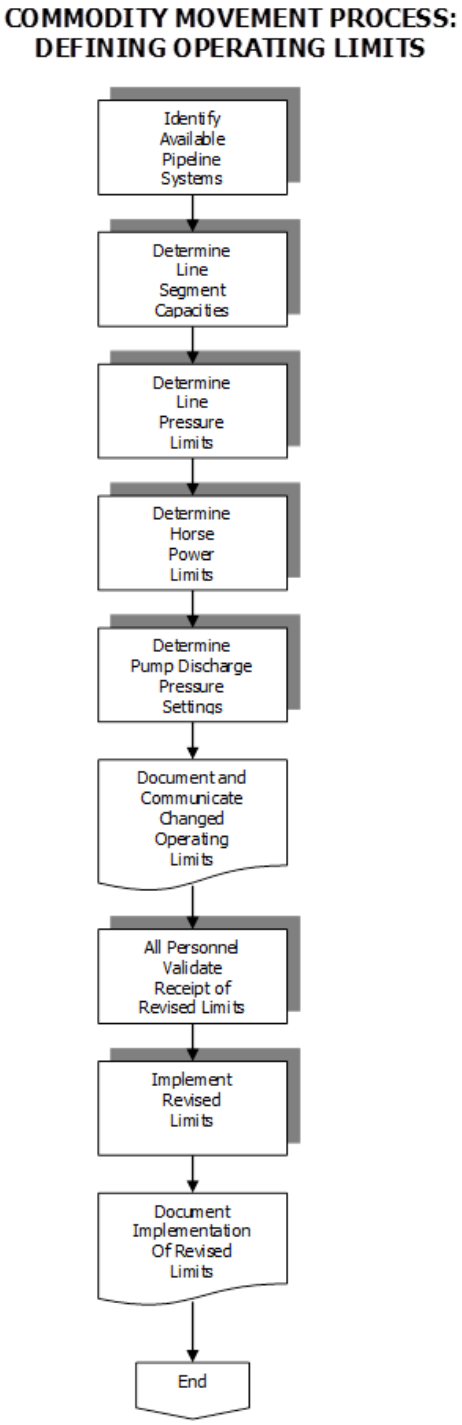

COMMODITY MOVEMENT PROCESS:
DEFINING OPERATING LIMITS
Identify Available Pipeline Systems
Determine Line Segment Capacities
Determine Line Pressure Limits
Determine Horse Power Limits
Determine Pump Discharge Pressure Settings
Document and Communicate Changed Operating Limits
All Personnel Validate Receipt of Revised Limits
Implement Revised Limits
Document Implementation Of Revised Limits
End

Figure 2B

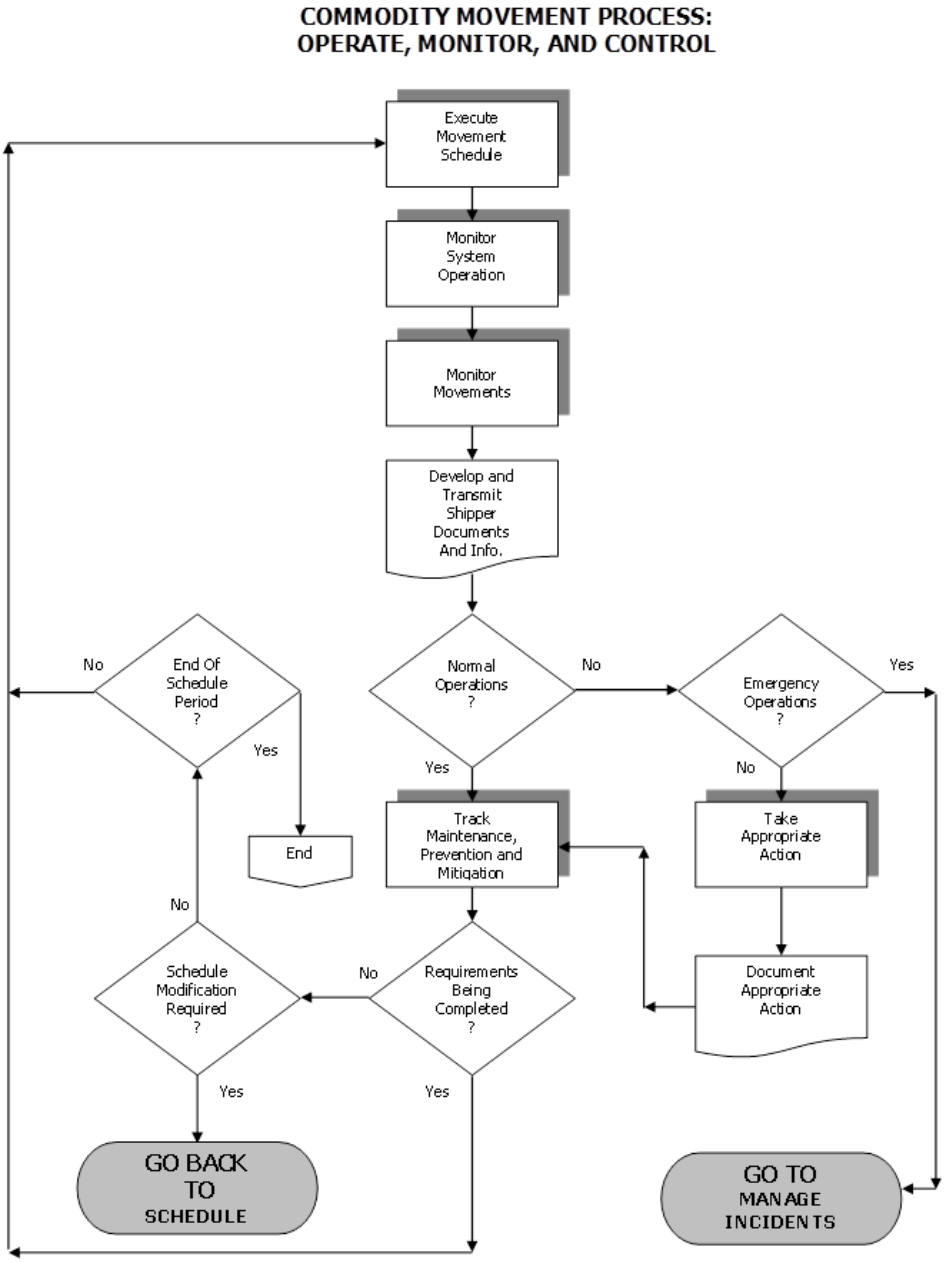

COMMODITY MOVEMENT PROCESS:
OPERATE, MONITOR, AND CONTROL
Execute Movement Schedule
Monitor System Operation
Monitor Movements
Develop and Transmit Shipper Documents And Info.
Normal Operations ?
No
Emergency Operations ?
Yes
Yes
No
End Of Schedule Period ?
No
Yes
End
Track Maintenance, Prevention and Mitigation
Take Appropriate Action
Document Appropriate Action
Requirements Being Completed ?
No
Schedule Modification Required ?
No
Yes
Yes
GO BACK TO SCHEDULE
GO TO MANAGE INCIDENTS

Figure 2C

COMMODITY MOVEMENT PROCESS:
SCHEDULE MOVEMENTS, MAINTENANCE, PREVENTION AND MITIGATION

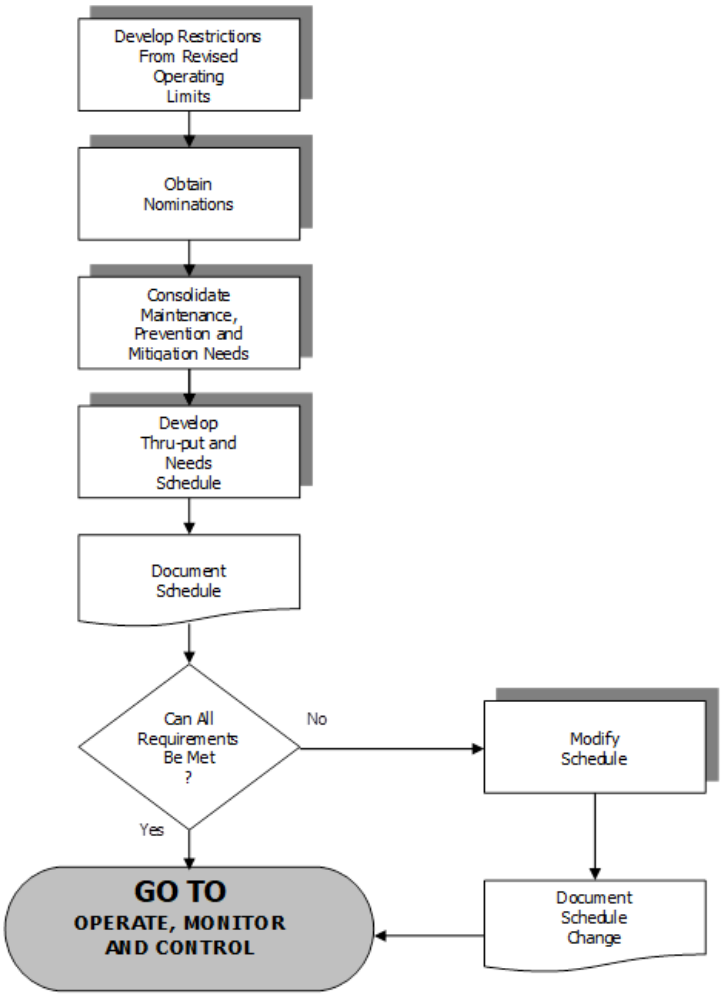


Figure 2D

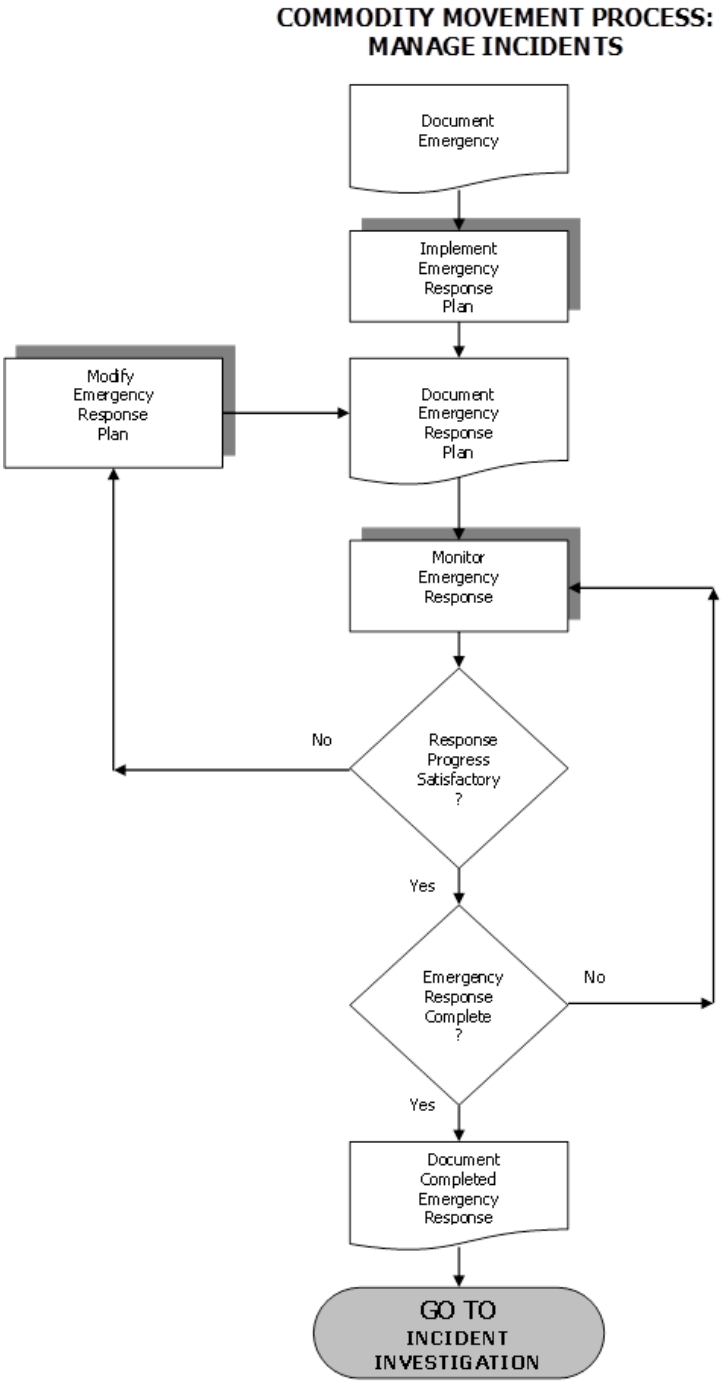

COMMODITY MOVEMENT PROCESS:
MANAGE INCIDENTS
Document Emergency
Implement Emergency Response Plan
Modify Emergency Response Plan
Document Emergency Response Plan
Monitor Emergency Response
No
Response Progress Satisfactory ?
Yes
Emergency Response Complete ?
No
Yes
Document Completed Emergency Response
GO TO INCIDENT INVESTIGATION

Figure 3A

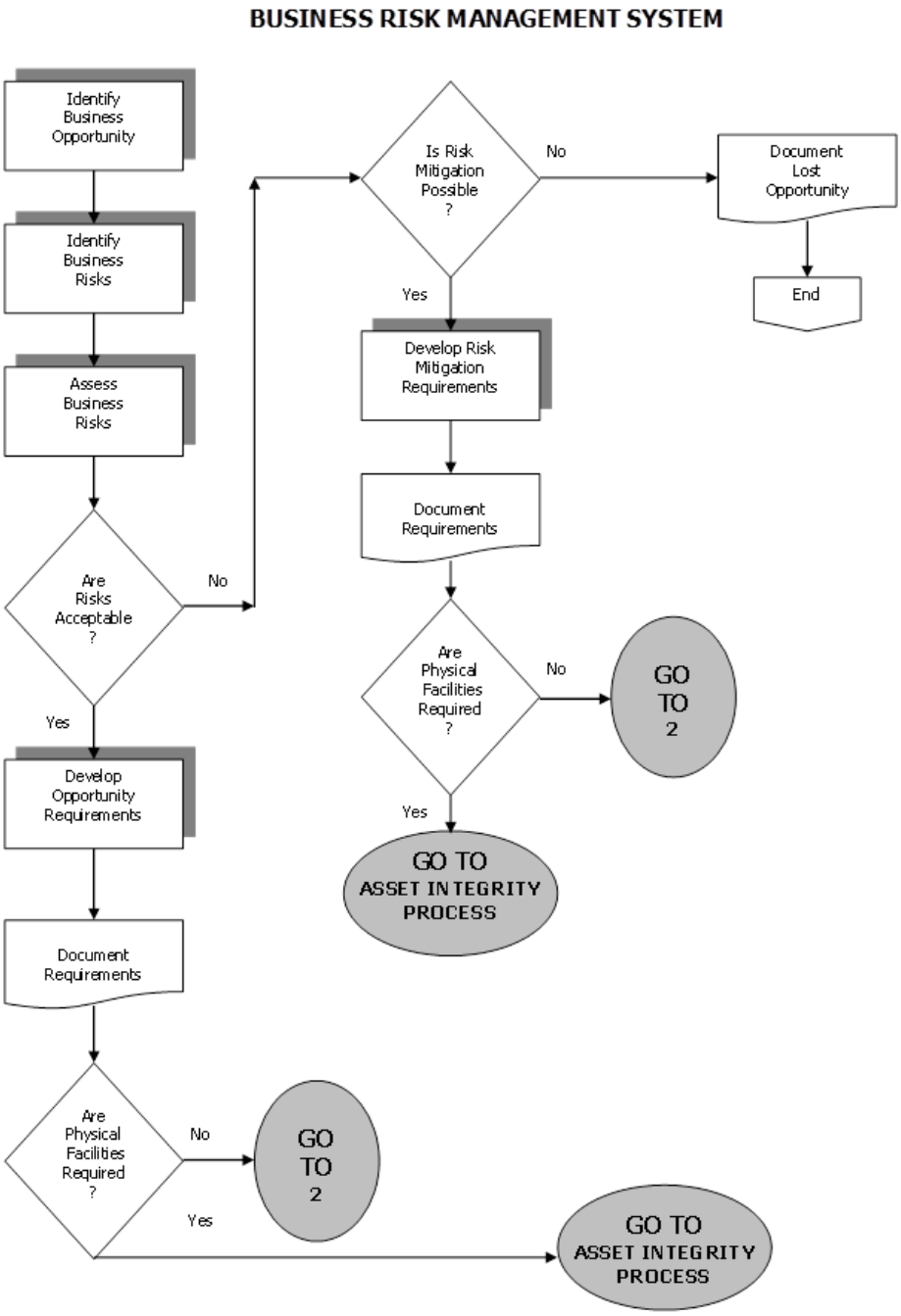

BUSINESS RISK MANAGEMENT SYSTEM
Identify Business Opportunity
Identify Business Risks
Assess Business Risks
Are Risks Acceptable ?
No
Yes
Develop Opportunity Requirements
Document Requirements
Are Physical Facilities Required ?
No
GO TO 2
Yes
GO TO ASSET INTEGRITY PROCESS
Is Risk Mitigation Possible ?
No
Document Lost Opportunity
End
Yes
Develop Risk Mitigation Requirements
Document Requirements
Are Physical Facilities Required ?
No
GO TO 2
Yes
GO TO ASSET INTEGRITY PROCESS

Figure 3B

BUSINESS RISK MANAGEMENT SYSTEM
(Continued)

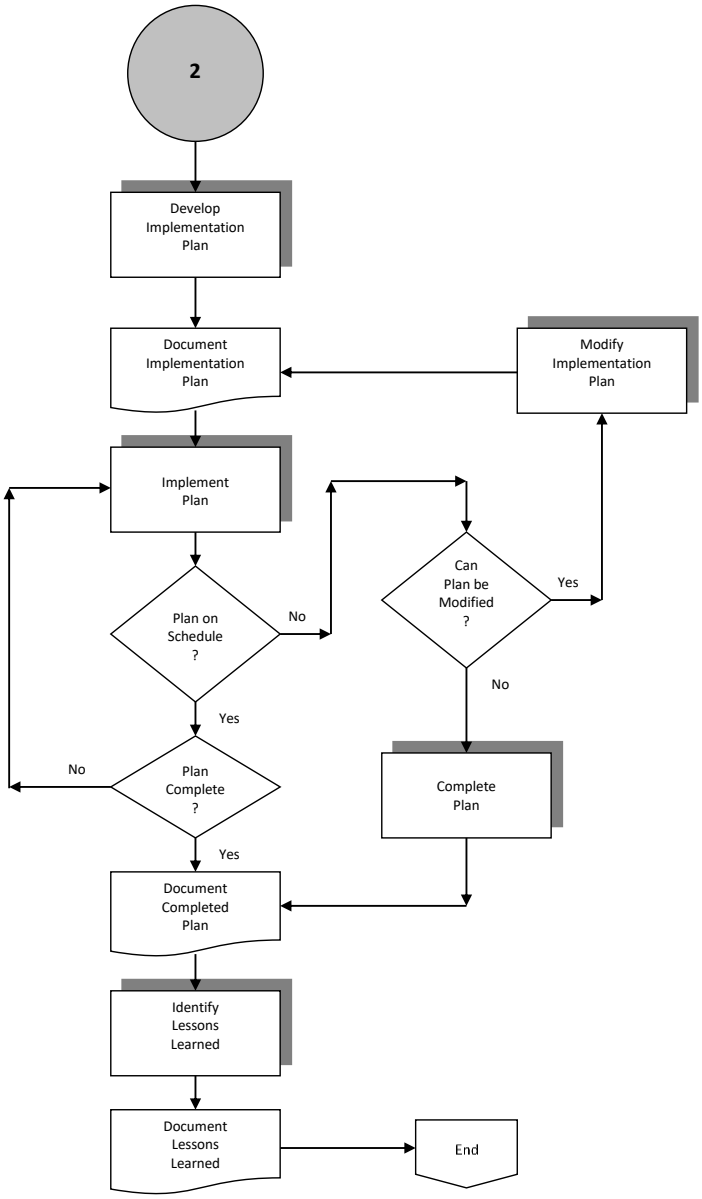


Figure 4A

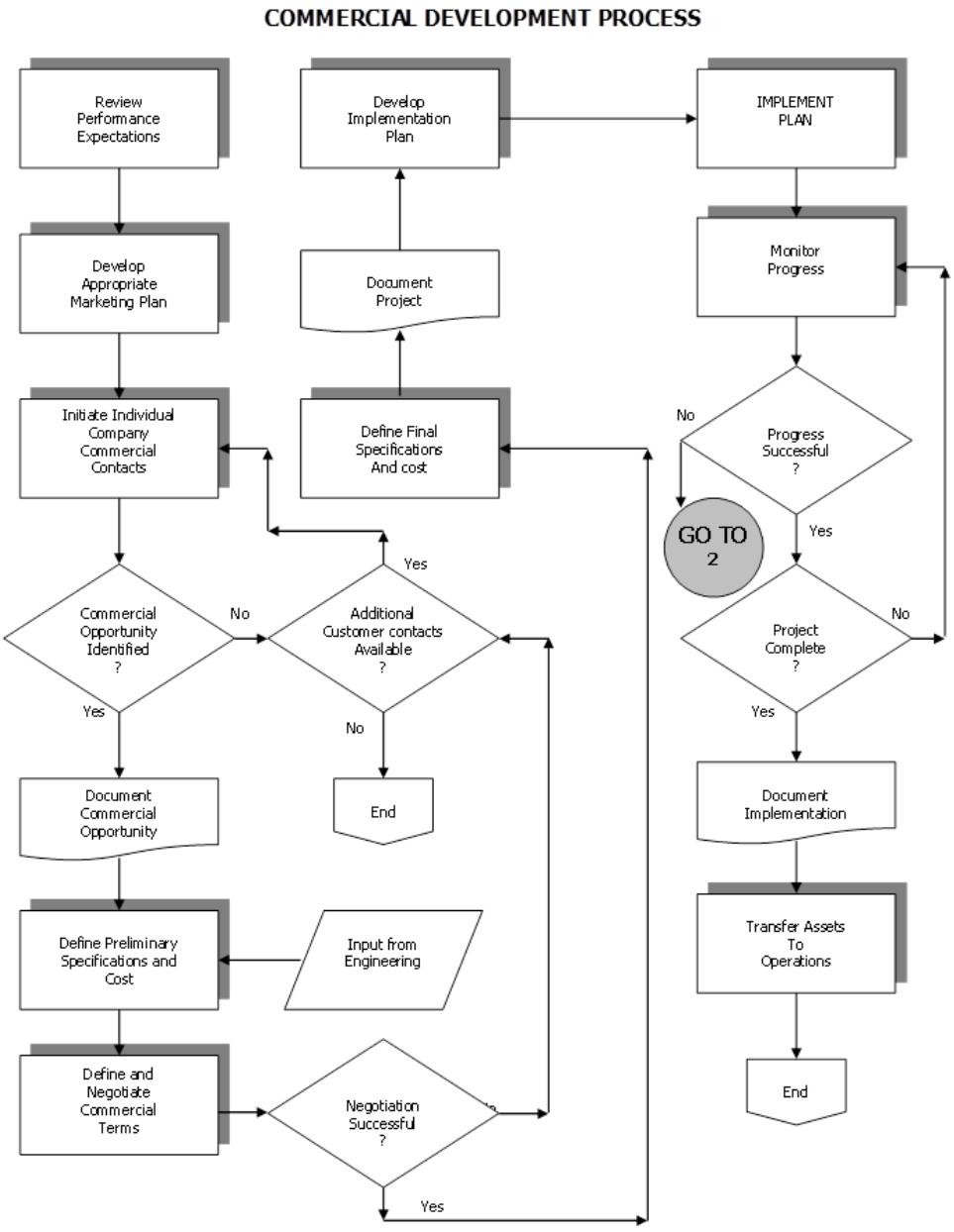

COMMERCIAL DEVELOPMENT PROCESS
Review Performance Expectations
Develop Appropriate Marketing Plan
Initiate Individual Company Commercial Contacts
Commercial Opportunity Identified ?
No
Yes
Additional Customer contacts Available ?
Yes
No
End
Document Commercial Opportunity
Define Preliminary Specifications and Cost
Input from Engineering
Define and Negotiate Commercial Terms
Negotiation Successful ?
Yes
Document Project
Develop Implementation Plan
Define Final Specifications And cost
IMPLEMENT PLAN
Monitor Progress
No
Progress Successful ?
Yes
GO TO 2
Project Complete ?
No
Yes
Document Implementation
Transfer Assets To Operations
End

Figure 4B

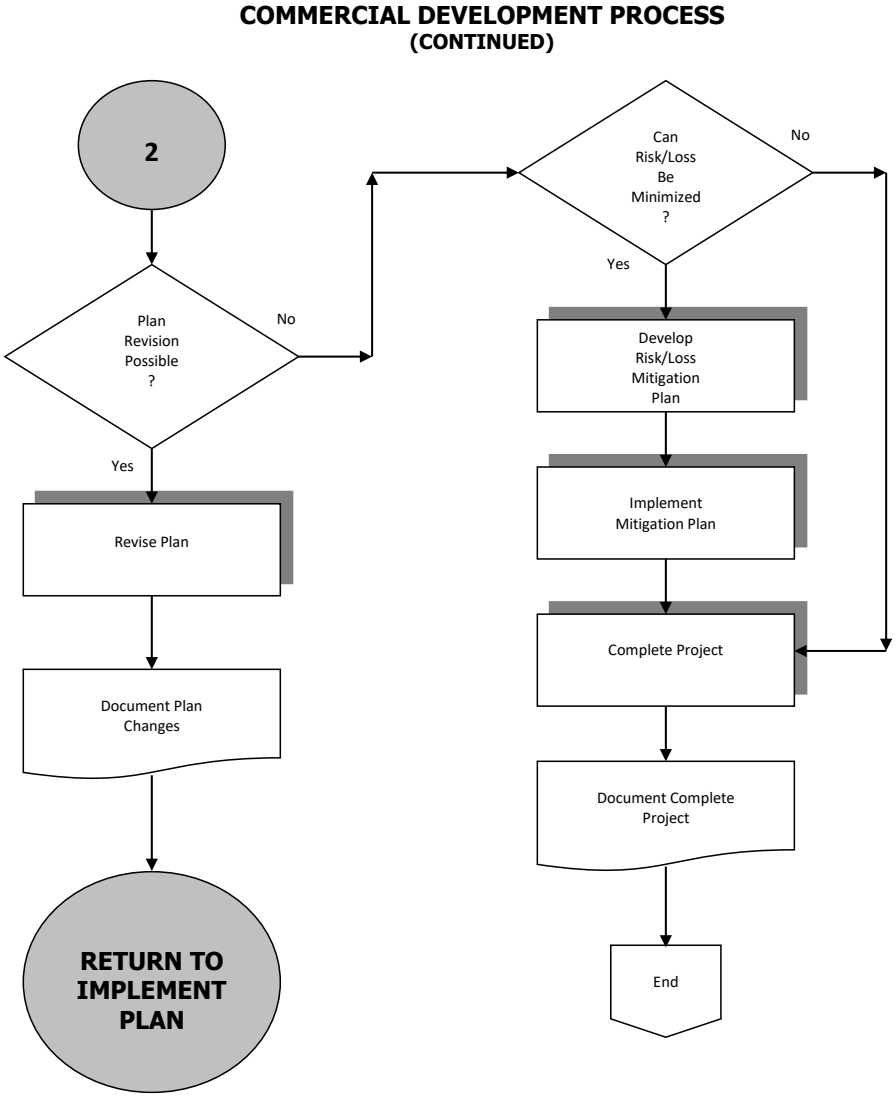

COMMERCIAL DEVELOPMENT PROCESS
(CONTINUED)
2
Plan Revision Possible ?
No
Yes
Revise Plan
Document Plan Changes
RETURN TO IMPLEMENT PLAN
Can Risk/Loss Be Minimized ?
No
Yes
Develop Risk/Loss Mitigation Plan
Implement Mitigation Plan
Complete Project
Document Complete Project
End

Figure 5A

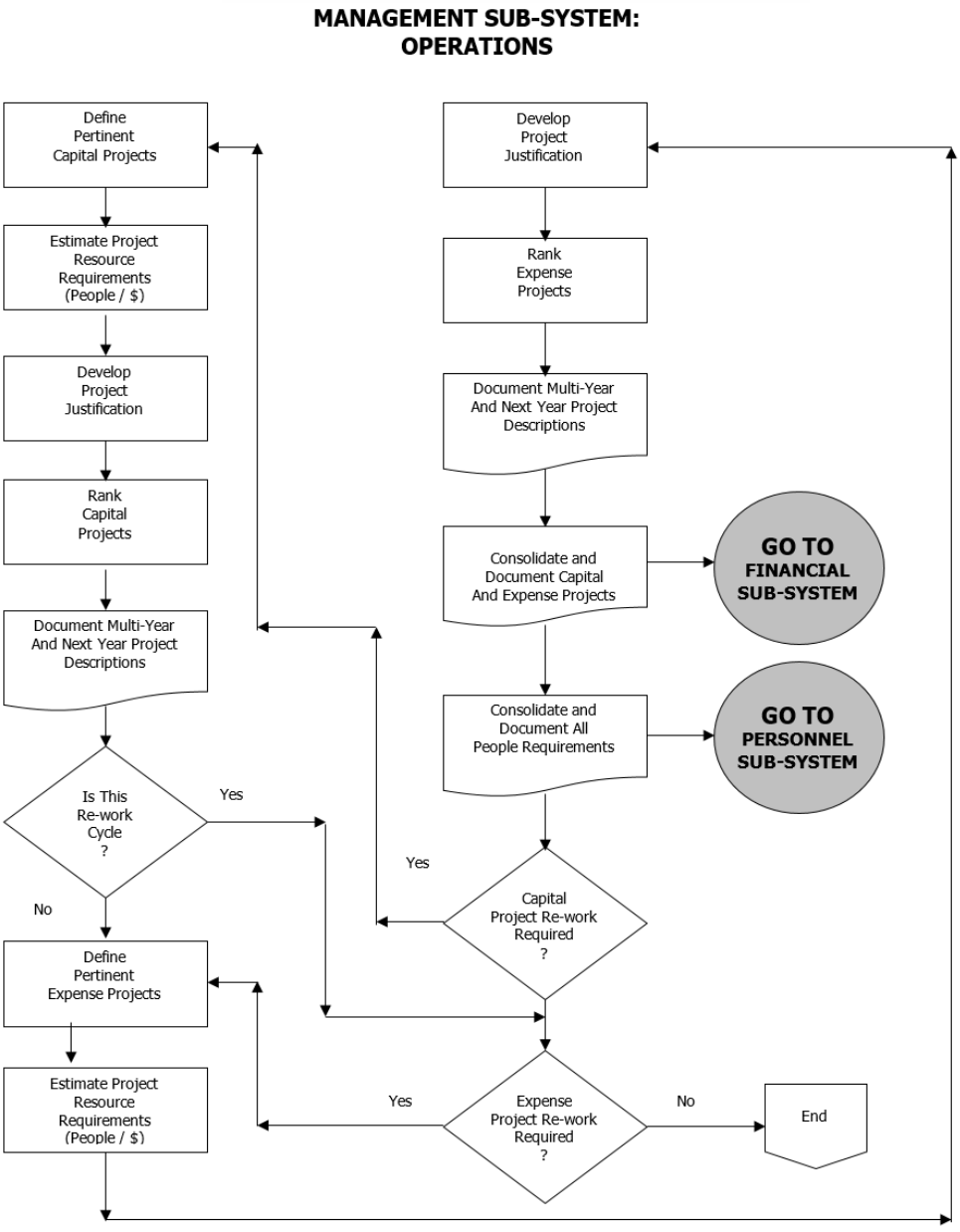

MANAGEMENT SUB-SYSTEM:
OPERATIONS
Define Pertinent Capital Projects
Estimate Project Resource Requirements (People / $)
Develop Project Justification
Rank Capital Projects
Document Multi-Year And Next Year Project Descriptions
Is This Re-work Cycle ?
Yes
No
Define Pertinent Expense Projects
Estimate Project Resource Requirements (People / $)
Develop Project Justification
Rank Expense Projects
Document Multi-Year And Next Year Project Descriptions
Consolidate and Document Capital And Expense Projects
GO TO FINANCIAL SUB-SYSTEM
Consolidate and Document All People Requirements
GO TO PERSONNEL SUB-SYSTEM
Capital Project Re-work Required ?
Yes
Expense Project Re-work Required ?
Yes
No
End

Figure 5B

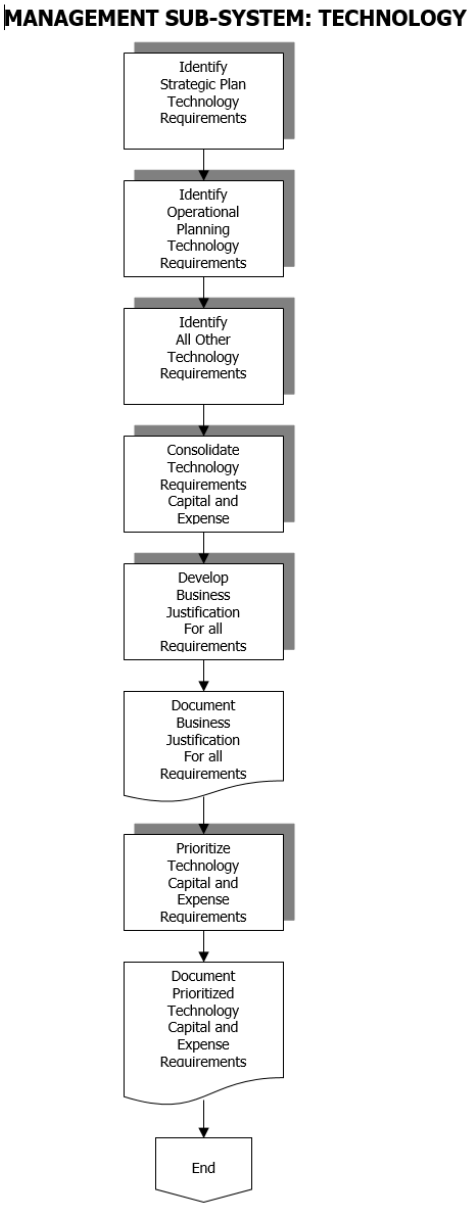

MANAGEMENT SUB-SYSTEM: TECHNOLOGY
Identify Strategic Plan Technology Requirements
Identify Operational Planning Technology Requirements
Identify All Other Technology Requirements
Consolidate Technology Requirements Capital and Expense
Develop Business Justification For all Requirements
Document Business Justification For all Requirements
Prioritize Technology Capital and Expense Requirements
Document Prioritized Technology Capital and Expense Requirements
End

Figure 5C

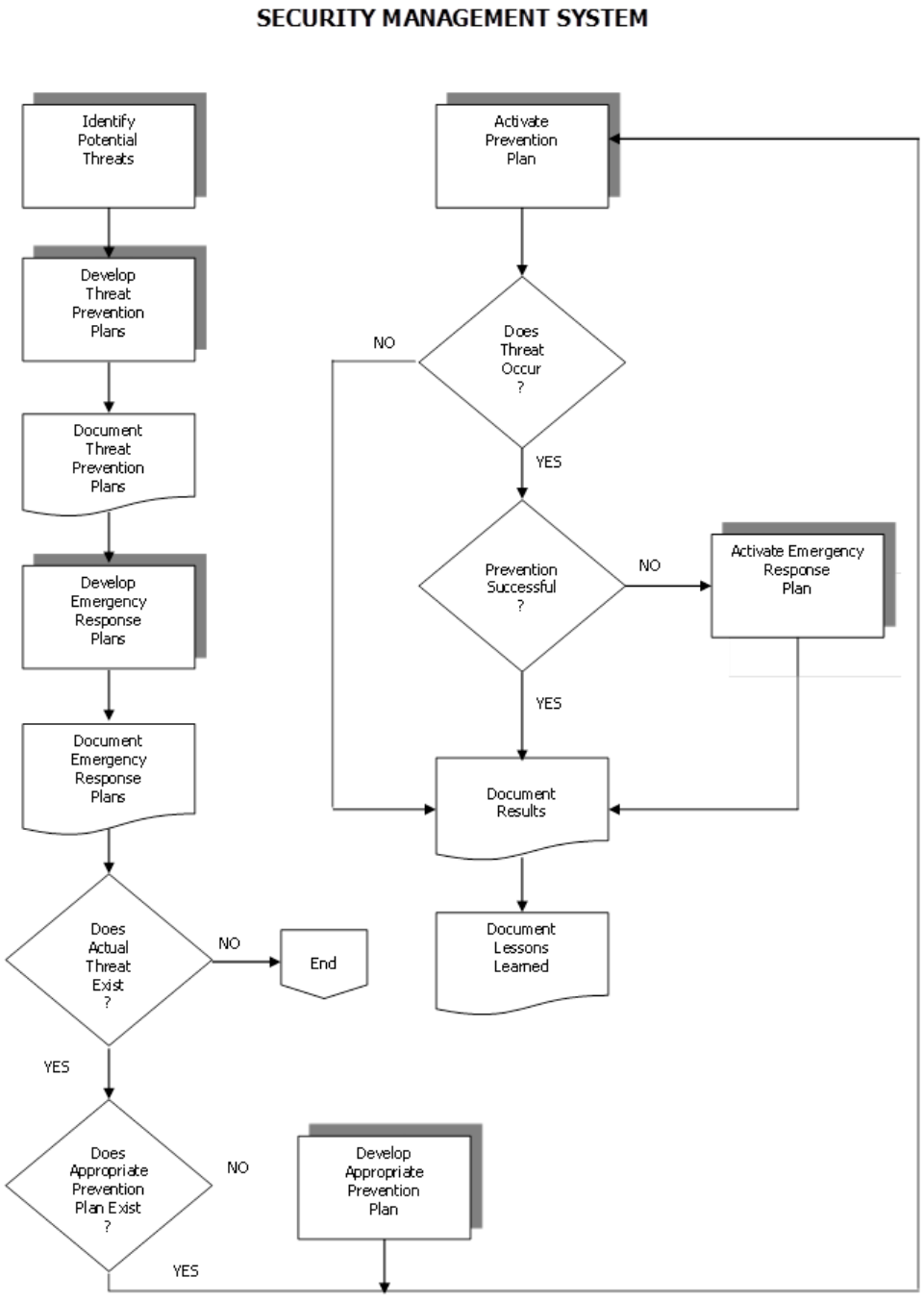
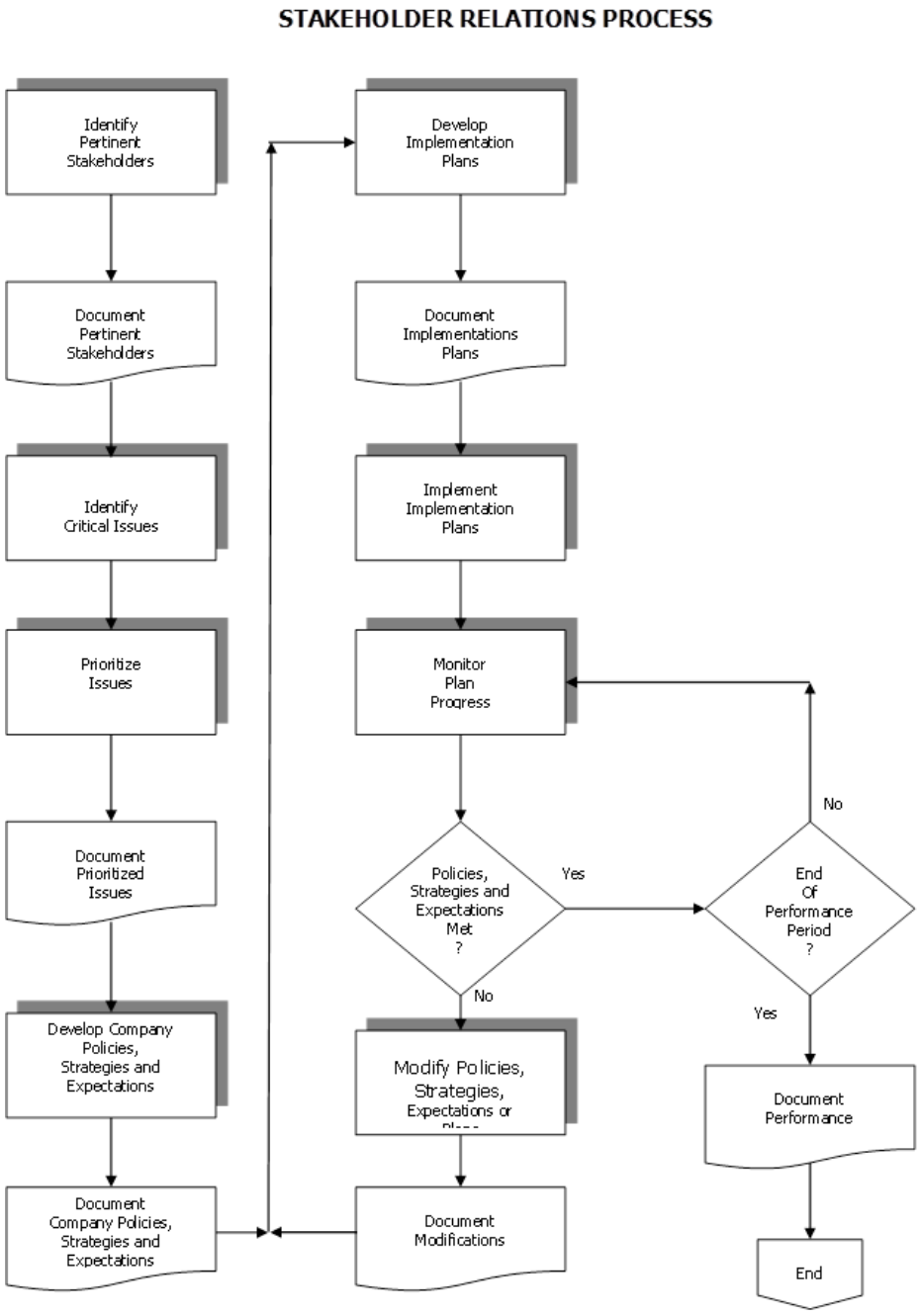

SECURITY MANAGEMENT SYSTEM
Identify Potential Threats
Develop Threat Prevention Plans
Document Threat Prevention Plans
Develop Emergency Response Plans
Document Emergency Response Plans
Does Actual Threat Exist ?
NO
End
YES
Does Appropriate Prevention Plan Exist ?
NO
Develop Appropriate Prevention Plan
YES
Activate Prevention Plan
Does Threat Occur ?
NO
YES
Prevention Successful ?
NO
Activate Emergency Response Plan
YES
Document Results
Document Lessons Learned

Figure 5D


STAKEHOLDER RELATIONS PROCESS
Identify Pertinent Stakeholders
Document Pertinent Stakeholders
Identify Critical Issues
Prioritize Issues
Document Prioritized Issues
Develop Company Policies, Strategies and Expectations
Document Company Policies, Strategies and Expectations
Develop Implementation Plans
Document Implementations Plans
Implement Implementation Plans
Monitor Plan Progress
Policies, Strategies and Expectations Met ?
Yes
No
Modify Policies, Strategies, Expectations or
Document Modifications
End Of Performance Period ?
No
Yes
Document Performance
End

About the Author

Joseph W. (Joe) Martinelli is a charter member of the National Academy of Construction. He was president of Chevron Pipe Line Company before forming Performance Improvement Consultants in 1998, now PiPRO. Previously, he was the general manager of Chevron's Engineering Technology Department, vice president of Petro-Canada, and held numerous domestic and international positions with Gulf Oil. He is a former chairman of the Construction Industry Institute (CII) and was a Baldrige Quality Award examiner for three years.