The Mosaic Company
3033 Campus Drive, Suite E490
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Turnaround/Major Project Safety Program
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Turnaround Management Process Procedures
TMPP-A01 Manual Introduction

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Introduction

The Turnaround Management Process Procedures Manual is designed to implement a consistent approach of the best management processes, practices, and planning techniques in the management and execution of company's shutdowns and turnarounds. It supports the Mosaic's commitment to:

- Continuously improve all turnaround management processes and eliminate non-value added activities
- Achieve highest turnaround results based upon an established performance criteria in a safe and efficient work environment
- Provide highest value to the customers, shareholders, community and the company staff.

All the plant departments must commit to continuously strive to comply with these procedures and contribute to the company's capabilities to successfully achieve its business goals and turnaround performance objectives.

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4.2 Purpose

The principal purpose of this Turnaround Management Process Procedure manual is to document and comply with Mosaic's policies, procedures and standards in the planning and executing of plant turnarounds. The manual identifies the latest company structure, organizational interfaces and job responsibilities as they relate to the management of plant turnarounds.

The manual is intended to provide a consistent approach to plan the turnarounds by establishing the best management processes, practices and planning techniques as these apply to Mosaic facilities. It provides an opportunity to learn from the existing capabilities and proven turnaround planning knowledge. In addition, all company departments are committed to seek and implement improvements from this manual in order to enhance the performance of future turnarounds.

The Turnaround Management Process Procedures Manual is a multi-disciplinary dynamic document and offers guidelines to the turnaround planning efforts, and at the same time benefits by institutionalizing the successful execution experiences and modern planning techniques.

4.2.1 Utilization Guidelines

The Turnaround Management Teams are required to use these procedures as a guideline and reference document in order to reduce the learning curve on each turnaround and maximize the benefits from proven and established turnaround management techniques.

The Turnaround Management Process Procedures Manual identifies the company's best management processes and practices by providing:

- Reference material formats and examples for the planning and execution of plant turnarounds
- Training materials for the company's and contractor's turnaround personnel.
- Formats for planning, execution and control documents that need the company's highest performance standard.

The turnaround teams should use this manual and modify (if necessary) the sample format in this manual to meet their specific turnaround needs. The customized formats will reduce the development time required to create a turnaround-specific management strategy and execution plan.

In using this manual to develop plans for your specific turnaround, keep in mind the following considerations:

- Every effort is made to utilize the proven practices and planning techniques identified in this manual.
- Customize and modify the format to meet the specific needs of a turnaround.
- Ensure compliance to all company standards, procedures, and regulatory requirements.

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4.2.2 Turnaround Classification

In order to effectively utilize this manual, the turnarounds are categorized in three different classifications by size as it relates to expense turnaround budgets:

- Small Turnarounds Less than $1 Million
- Medium Turnarounds Between $1and $3 Million
- Large Turnarounds Larger than $3 Million

Classification of turnarounds can vary when considering the magnitude of capital work scope that must be completed during this turnaround window.

In general, all the best turnaround management practices and planning techniques will apply to all sizes of the turnarounds. However, the magnitude of the effort, timing and resources required will vary by the size of the turnaround. The magnitude of effort, resource, etc. as applicable to each turnaround classification will be clearly identified and the differences highlighted.

4.3 Manual Distribution

All copies of this manual are documented, and are issued to designated positions rather than individuals. If the position is canceled or renamed, then the manual should be returned to the Turnaround Group for any correction and/or re-issuing as required.

In addition to hard copies the latest contents of this manual can also be found on company's intranet.

4.3.1 Proprietary Information

The manual contains company proprietary information. All manual holders are required to keep this manual in a secured place. Copying of manual contents are prohibited without the approval and written authorization of the Plant Managers and/or Turnaround Group Advisor.

4.4 Manual Development Responsibilities

The manual development will be done under the leadership of the Turnaround Group. The input to various chapters will be provided by the subject experts working at the various plants of the company. The manual chapters will be reviewed by the members of Turnaround Excellence Council with the input of staff from related departments. The Turnaround Group will ensure the quality and format of information is consistent with the company standards and supports Mosaic's Turnaround Management Process.

4.5 Updates and Revisions

The Turnaround Group is responsible for documenting and issuing approved changes to the Turnaround Management Process Procedures Manual. Each manual holder is responsible for keeping his or her copy up to date as changes and additions are issued. Temporary Bulletins and formal Revisions will be issued to document approved changes to this manual.

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4.5.1 Revisions

Revisions will be issued to reflect changes or to add information to the manual. Revision pages will be accompanied by a revision notice. All changes or additions will be summarized and explained on the Revision Notice, along with instructions for updating the manual. All changes to the manual through the formal revision process must be approved by the Central Turnaround Group.

4.5.2 Revision Control Record

All revisions and additions should be documented in the revision control record in the front of the manual. List the revision number, date inserted, and sign in the space provided. The Revision Control Record provides documentation that the Turnaround Management Process Procedure Manual is up to date.

4.5.3 Manual Update

A formal Turnaround Management Process Procedures Manual review will be scheduled at a minimum of once per year to review the manual in its entirety and issue a formal Manual Update. Review meetings are to be attended by the members of the TAR Excellence Council. Meetings will be facilitated by the Central Turnaround Group.

Based on the input and feedback of all the participants, revisions to the existing manual will be identified and incorporated in the manual. The updated manual will then again be submitted to the Mosaic's Turnaround Executive Council for their review and final approval

This Work Sheet should be used to recommend any modifications/changes to improve the turnaround planning and execution process. Use additional sheets as necessary to explain your recommended changes.

4.5.4 Revision Work Sheet

Reference Procedure: (Describe the procedure, practice or format that needs to be revised.)

Recommended Modification/Change: (Describe the proposed change along with format, sketch and associated details.)

Benefits from Modification/Change: (Explain how the modification/change will help the company turnarounds as it relates to safety, mechanical integrity, efficiency, productivity, etc.)

4.6 Training and Indoctrination

The Central Turnaround Group will be responsible for training the Mosaic staff on the complete Turnaround Management Process Procedures Manual. The training will give participants the tools to use the best turnaround management processes, practices and planning techniques. As necessary, the contractor employees may be indoctrinated into the Mosaic's Turnaround Management Process Procedures.

All the company staff participating in the planning and execution of plant turnarounds are expected to have complete understandings of these procedures and proficiency in their specific functional areas.

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4.7 Review Checklist

- The Central Turnaround Group is responsible to develop, update, and manage all issues related to this manual.
- The latest version of the manual, reference documents and attachments will be available at the Mosaic website.
- All users should follow the guidelines to make changes or update these procedures.
- Training sessions periodically scheduled throughout the year.

5.0 REFERENCES

- Turnaround Management Process Procedures Manual

6.0 ATTACHMENTS

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TMPP-A02 TURNAROUND MANGEMENT PROCESS

1.0 PURPOSE

The purpose of the Turnaround Management Process is to provide a mechanism for the production, engineering, EHS, and maintenance personnel to identify, plan, schedule and efficiently execute all turnaround activities. A standardized Turnaround Management Process will also ensure that the turnaround focus should always be to maintain asset reliability and improve operational processes.

2.0 RESPONSIBILITY

The Plant Management at each of the Mosaic sites is responsible for the total implementation of this Turnaround Management Process and associated procedures. It is the responsibility of the Mosaic staff from all departments and contractors' site management who are involved in the turnaround to fully understand and follow this Turnaround Management Process.

3.0 SCOPE

The Turnaround Management Process is a comprehensive document that addresses wide range of topics and subjects tied to various phases of turnaround planning and execution. Some of the important topics covered include:

- Work scope identification and prioritization
- Planning and scheduling
- Organization structure and resource requirement
- Procurement of materials
- Contracting strategy and plans
- Optimized operations plans for shutdowns and start-up

The Turnaround Management Process creates a work environment which encourages synergism among the maintenance, production and engineering personnel and helps in the formation of high performance turnaround teams. The Turnaround Management Process ensures the collection of equipment history as it relates to new capital project additions, what repairs were performed and additional modifications that need to be done during future turnarounds.

4.0 COMMUNICATION

The Turnaround Management Process should be communicated to all Mosaic staff and contractors involved in the planning and execution of turnaround activities. The Document Control Coordinator maintains the Document Control Procedure. The controlling procedure is available on the Mosaic's Maintenance and Engineering Intranet.

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5.0 PROCEDURE

5.1 Phase 1: Business and Conceptual Development

5.1.1 Description

The Business and Conceptual Development phase begins 8 to 12 months prior to the planned turnaround start date. This phase is significant as it ensures early dialogue among business, marketing, production, inspection and capital project staff.

The Turnaround Basis outlining the purpose, reasons and performance expectations from the turnaround is formalized and agreed to by all key stakeholders. The major work scope items are identified in order to establish a target budget estimate, time frame and downtime duration for the turnaround. (Fiscal budget preparation may be well before the 8-12 month time frame.)

5.1.2 Key Phase Objectives

Establish a Turnaround Basis outlining the purpose, reasons and performance expectations for the turnaround. The Turnaround Basis reflects business and marketing considerations, in addition to plant's mechanical integrity needs, capital projects and other production performance expectations.

Update the 5-year turnaround cycle based on the current business goals, capital plans, operations and mechanical integrity considerations.

5.1.3 Principal Focus

- Company's Current Business Focus
- Marketing Plan and Forecasts
- Supply Projections of Raw Materials e.g. Sulfur, etc.
- Operations Reliability and Performance
- Mechanical Integrity Performance Assessment
- Regulatory Compliance and permit Applications
- Capital Program Interfaces
- Turnaround Basis
- Business Opportunities / Cost Impact Analysis

5.1.4 Participants

- Plant Manager
- Maintenance Manager
- Business and Marketing Representative
- EHS Representative
- Area Production Superintendent

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- Area Maintenance Superintendent
- Reliability Engineer
- Project Engineer
- Supply Chain Representative
- Turnaround Advisor
- Turnaround Manager

5.1.5 Activities

- Establish Turnaround Basis
- Identify major work scope items for both expense and capital projects
- Conduct Business Impact Assessment of turnaround downtime
- Review plant performance – operations, maintenance, etc.
- Determine and apply for regulatory permits (local, state and federal)
- Form a Turnaround Core Team and define responsibilities.

5.1.6 Tools and Processes

- Long-Term 5-year Turnaround Cycle
- Company's Business Focus and Forecast
- Marketing Plan and Outlook
- Materials Balance Reconciliation
- Supply Forecast for Raw Materials
- Business Impact Assessment of Turnaround Downtime
- Operations / Process Performance Records
- Company's Turnaround Vision / Expectations
- Mechanical Integrity and Equipment History Records
- Inspection / Certification Schedule
- Capital Program Plans
- Turnaround Budget Projections
- RM&RR analysis – 5 factor test for sulfuric acid plant repair/replacement projects
- Turnaround Management Process Procedures Manual

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5.1.7 Reviews

Corporate Management Review: Ensure that the company and plant's 5-Year Turnaround Cycles are consistent with the company's business goals, plant's capital programs, mechanical integrity needs and operational performance expectations.

5.1.8 Deliverables

- Turnaround Basis
- Updated 5-Year Turnaround Cycle
- Business Impact Assessment of Turnaround Downtime
- Permit Applications / or Certification Requirements
- Turnaround Milestone Schedule
- Turnaround Time Frame and Target Duration (Preliminary)
- Turnaround Target Budget (Preliminary)
- Turnaround Team Organization for Strategic Planning and Work Scope Phase

5.1.9 Decision Milestone

Approve the Turnaround Basis and update 5-Years Turnaround Cycle. Decide to proceed with the Strategic Planning and Work Scope Phase.

5.1.10 Decision Gatekeepers

- Plant Manager
- Maintenance Manager
- Area Production Superintendent
- Area Maintenance Superintendent
- Business and Marketing Representative
- Turnaround Manager

5.1.11 Phase Timing

The Business and Conceptual Development is an ongoing process and starts 7-12 months before the turnaround start date depending upon its size and complexity.

- Small 7 -9 Months
- Medium 9-10 Months
- Large 11-12 Months

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5.2 Phase 2: Strategic Planning and Work Scope

5.2.1 Description

During the Strategic Planning and Work Scope phase the major emphasis is to establish turnaround goals, identify potential risks and develop strategies for a successful turnaround. All work scope lists and inputs are gathered and assembled while the turnaround organization is defined and strategic planning is initiated. All work scope requests must be reviewed by the sub-team for their review, impact assessment and final approval.

As the turnaround work scope is defined, the preliminary critical path schedules are generated to evaluate alternative execution approaches. At the end of this phase, the Sub-Team presents the Approved Work scope List and Turnaround Execution Strategy to the Core Team for their approval to proceed to the next Detailed Planning Phase. The core team should establish the “Design Freeze Date”.

5.2.2 Key Phase Objectives

Establish turnaround goals, identify risks, and determine potential problems and weak areas. Develop strategies and company’s initiatives that will ensure turnaround success. Develop Contracting Strategy and order long-lead materials.

5.2.3 Principal Focus

- Participation and Involvement of all Stakeholders
- Alignment of Business and Turnaround Goals
- Work Scope Development
- Integration with Capital Projects
- Potential Risks, Weak Areas and Their Mitigation Plans
- Strategies and Initiatives for a Successful Turnaround

5.2.4 Participants

- Plant Manager
- Maintenance Manager
- Turnaround Manager
- EHS Representative
- Area Production Superintendent
- Area Maintenance Superintendent
- Reliability Engineer
- Project Engineer
- Buyer

- Maintenance / Turnaround Planner
- Turnaround Advisor

5.2.5 Activities

- Review previous turnaround de-briefings and performance evaluations
- Review risk-based inspection reports
- Budget validation based on approved work scope
- Interface with Capital Projects
- Production's input in work scope development
- Process engineering's input to turnaround work scope
- Maintenance's input to turnaround work scope
- Incorporate EHS requirements in the turnaround work scope
- Review Mechanical Integrity assessment and Inspection Reports
- Develop contracting strategy
- Order long lead-time materials

5.2.6 Tools and Processes

- Operations / Process Performance Records
- Inspection and Equipment History Records
- Mechanical Integrity Assessment Study
- Equipment Inspection and Certification Schedule
- Past Turnaround Performance Evaluations
- Capital Projects Work Scope and Execution Plans
- Turnaround Related Work Scope Backlog
- Work Scope Criteria
- Turnaround Management Process Procedures Manual

5.2.7 Reviews

Turnaround Strategic Planning Review: Evaluation of turnaround basis, strategic initiatives, and Turnaround Management Plan. Ensure that the turnaround focus is consistent with company's business goals, safety, operational reliability and mechanical integrity needs.

5.2.8 Deliverables

- Turnaround Goals
- Key Performance Indicators (KPI's)

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- EHS Turnaround Strategy
- Approved Work Scope List
- Contracting Strategy and Plan
- Target Turnaround Schedule Duration and Milestones
- Cost Estimate +/- 25%
- Preliminary Critical Path Schedule.
- Long Lead-time Materials Ordered.
- Inspection and Quality Control Requirements
- Turnaround Management Plan
- Plan to Plan the Turnaround
- Turnaround Team Staffing Plan for Detailed Planning Phase

5.2.9 Decision Milestone

Approve the Turnaround Work Scope and give commitment to support the Turnaround Execution Strategy and Plans. Decide to proceed with the Detailed Planning phase of the turnaround and implement the "Design Freeze Date".

5.2.10 Decision Gatekeepers

- Plant Manager
- Maintenance Manager
- Area Production Superintendent
- Area Maintenance Superintendent
- Turnaround Manager

5.2.11 Phase Timing

The Strategic Planning and Work Scope phase starts at least 6-11 months before the turnaround date depending upon turnaround's size and complexity.

- Small 6-7 Months
- Medium 7-9 Months
- Large 9-11 Months

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5.3 Phase 3: Detailed Planning

5.3.1 Description

During the Detailed Planning phase all approved turnaround work scope, capital project work and operation's shutdown and startup activities are included in integrated turnaround plans and schedules. Detailed work scope packages are developed for all approved work scope items and these are then reviewed by key departments such as production, EHS, inspection, etc. to ascertain their completeness.

A Work Scope Variance Process is utilized to control, review, and, if appropriate, approve additional work requests that arise after the work scope list has been finalized and the "Design Freeze" Date set. Estimates are developed to firm up the turnaround control budgets. A contingency plan is developed for potential work scope growth and new found work after the inspections are completed in the execution phase.

During this phase, all contractors are selected and they actively participate in the development and finalization of turnaround execution plans as it relates to time, cost, manpower, etc.

5.3.2 Key Phase Objectives

Finalize execution schedule plans along with control budget, manpower requirements and field logistics. Operations also develop their unit shutdown and start-up plans broken down by operating systems.

5.3.3 Principal Focus

- Selection of Contractors
- Detailed Plans for all Approved Work Scope
- Detailed Plans for Critical and Major Work Items, e.g. Turbines, etc.
- Procurement of Materials
- Alignment and Integration with Capital Projects
- Detailed Scheduling and Critical Path
- Operations' Shutdown and Start-Up Planning
- Turnaround Performance Tracking Controls for Progress, Cost, etc.
- Turnaround Logistics planning

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5.3.4 Participants

- Plant Manager
- Maintenance Manager
- Turnaround Manager
- EHS Representative
- Area Production Superintendent
- Area Maintenance Superintendent
- Reliability Engineer
- Project Engineer
- Buyer
- Turnaround Advisor
- Maintenance / Turnaround Planner
- CAT Logistics Representative
- Contractors and Sub-Contractors Leadership
- Central Maintenance Turnaround Planner

5.3.5 Activities

- Develop detailed execution plans
- Identify critical path and major milestones
- Review and approve additional work
- Select all key contractors and sub-contractors
- Contracts are in place for all major contractors
- Develop equipment cleaning and personnel entry plans
- Develop turnaround specific EHS Plan.
- Develop Waste Management Plan
- Integrate capital work with turnaround execution plans
- Develop Logistics Plan
- Develop productivity improvement plan
- Develop control budget +/- 10%
- Finalize performance, progress and cost reporting formats and systems
- Materials take-off and procure materials
- Select repair shops and service providers
- Get contractors' input in the development of execution plans

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- "What If" Session

5.3.6 Tools and Processes

- Company's EHS Procedures
- Planning and Scheduling System
- Cost Control System – Maximo
- Plan to Plan the Turnaround
- Final Work Scope List
- Contracting Strategy and Plan
- Training and Orientations Plan
- Work Scope Change Management Process
- PSM. MOC and PSSR Guidelines
- Turnaround Logistics Sub Team
- "What If" Process
- Turnaround Management Process Procedures Manual

5.3.7 Reviews

Turnaround Planning Preparedness Reviews: Ensure that the turnaround planning effort is on track and focused to meet the company's business and turnaround goals. Depending upon the size and complexity of the turnaround, more than one review may be required.

5.3.8 Deliverables

- Turnaround Specific EHS Plan
- Integrated Turnaround Execution Schedules
- Critical Path Activities and Milestones
- Resource Leveled and Optimized Manpower Plans
- Turnaround Organization and Staffing Plan for Execution Phase
- Company Resource Plan – Operators, Inspectors, Supervisors, Etc.
- Turnaround Management Plan
- Selected Contractors, Subcontractors and Repair Shops
- Logistics Plan
- Turnaround Project Controls and Reporting Documents
- Control Budget +/- 10%

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- Materials, Equipment and Tools Ordered and Procured
- Inspection Plan
- Shut-Down and Start-Up Plans and Procedures by Systems
- Equipment Cleaning Plan
- Detailed Shop Loading Plans
- Safety and Work Permit Plan (including LOTO, etc.)
- "What If" analysis

5.3.9 Decision Milestone

Approve the Project Execution Plans, Control Budget and Turnaround Schedule Milestones. Proceed with Pre-Turnaround Phase and start mobilizing the contractors and other resources needed for field execution.

5.3.10 Decision Gatekeepers

- Plant Manager
- Maintenance Manager
- Area Production Superintendent
- Area Maintenance Superintendent
- Turnaround Manager

5.3.11 Phase Timing

The Detailed Planning is (the most extensive and longest) phase and it starts at least 2-9 months before the turnaround date depending upon the turnaround size and complexity.

- Small 2-3 Months
- Medium 3-4 Months
- Large 4-9 Months

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5.4 Phase 4: Pre-Turnaround

5.4.1 Description

Pre-Turnaround phase work focuses on training and orientation of execution staff, contractor mobilization, finalization of execution plans, and completion of pre-turnaround work. This phase occurs 3-8 weeks before the turnaround start date.

During this phase all production, maintenance, engineering and contractors' staff must be fully oriented and aligned with the turnaround execution plans and reporting systems. This is an opportunity for all parties to understand the full work scope, the sequence and details of the shutdown process, and be ready for the execution phase.

5.4.2 Key Phase Objectives

Mobilize resources, indoctrinate turnaround staff with execution plans, stage materials, implement logistics plan, and get ready for efficient turnaround execution.

5.4.3 Principal Focus

- Highest EHS Performance
- Logistics Plan for Efficient Execution
- Mobilization of Company and Contractor Resources
- Staging of Materials, Construction Equipment, Tools, Blinds, Etc.
- Pre-Fabrication, Scaffolding and Support Services
- Temporary Facilities, Utilities, Transportation, Etc.
- Training, Orientation and Team Alignment
- Preparation for Safe Unit Shut-Down

5.4.4 Participants

- Plant Manager
- Maintenance Manager
- Turnaround Manager
- Area Production Superintendent
- Area Maintenance Superintendent
- Reliability Engineer
- Project Engineer
- Buyer
- EHS Representative
- Turnaround Advisor

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- Maintenance / Turnaround Planner
- CAT Logistics Representative
- Contractors, Sub-Contractors and Leadership
- Central Maintenance Turnaround Planner

5.4.5 Activities

- Implement Turnaround EHS Plan
- Operations, Maintenance and contractor training and orientation
- Mobilize all contractors and support services
- Conduct Pre Turnaround Contractors' Meeting
- Implement logistics plan
- Install temporary offices, stores, and tool houses
- Install all planned pre- turnaround scaffolding
- Mobilize the turnaround execution staff
- Provide orientation and indoctrination training to execution staff
- Implement progress tracking and reporting systems
- Turnaround execution dry run presentations

5.4.6 Tools and Processes

- Turnaround Specific EHS Plan
- Logistics Plan
- Training and Orientation
- Turnaround Management Plan
- Contractor Coordination Procedures
- Turnaround Schedules / Plans and Controls
- Progress Tracking and Forecasting System
- Cost Controls and Reporting System
- Field Safety Audits
- Materials Kitting and Staging at the Plant
- Turnaround Management Process Procedures Manual

5.4.7 Reviews

Pre-Turnaround and Logistics Review – All turnaround and execution systems are in place in order to ensure a safe and efficient turnaround.

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5.4.8 Deliverables

- All Pre-Turnaround Work Completed
- Resources and Logistics in Place for Efficient Turnaround
- Trained Execution Teams and Staff
- Clearly Defined Execution Staff's Roles and Responsibilities
- Mobilized Contractors and Support Services
- All Utilities and Services In Place
- All Materials Kitted and Staged
- Construction Equipment and Tools In Place
- Work Safety Permits and LOTO Systems are Finalized
- Finalized Protocol for Turnaround Meetings

5.4.9 Decision Milestone

Accept completed pre-turnaround activities and proceed with the Execution Phase and start shutting down the unit.

5.4.10 Decision Gatekeepers

- Plant Manager
- Maintenance Manager
- Turnaround Manager
- Area Production Superintendent
- Area Maintenance Superintendent

5.4.11 Phase Timing

The Pre-Turnaround Phase starts at least 3-8 weeks before the turnaround start date depending upon its size and complexity.

- Small 3-4 Weeks
- Medium 4-6 Weeks
- Large 6-8 Weeks

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5.5 Phase 5: Execution

5.5.1 Description

During this Execution phase, the principal focus is to safely shutdown the facilities and start executing the turnaround work scope. Operations ensure that all the facilities are shutdown as per the plans, blinds are installed, and equipment is cleared and prepared for inspection. The equipment is then released for repairs as per the schedule plans.

All the company and turnaround staff including contractors should ensure that there is top attention to keep safety and environment as key priorities.

The Execution Phase is complete when the repaired facilities are turned over to operations after the necessary completion checks, including PSSR (Pre-Startup Safety Review) compliance. Production leads the commissioning and start-up activities in order to get the facilities operating again and producing on-specification product.

5.5.2 Key Phase Objectives

Safely shutdown and clear the facilities and get it ready for inspection and repairs. Complete all the planned turnaround work scope safely and efficiently as per the plans. Start-up the facilities and produce on-spec products.

5.5.3 Principal Focus

- Safety and Environmental Compliance
- Shutdown, Clean and Turnover Facilities for Repairs
- Inspection of Equipment
- Efficient Field Execution
- Timely Issuance of Safe Work Permits
- Quality Control and Mechanical Integrity
- Management of Changes
- Compliance with Turnaround Schedules and Plans
- Cost / Progress Tracking, Reporting and Forecasting
- Turnover Completed Systems to Operations
- Commissioning, Start-Up and On-Spec Production

5.5.4 Participants

- Plant Manager
- Maintenance Manager
- Turnaround Manager
- Area Production Superintendent

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- Area Maintenance Superintendent
- Reliability Engineer
- Project Engineer
- Buyer
- EHS Representative
- Turnaround Advisor
- Maintenance / Turnaround Planner
- Commissioning and Start-up Team
- CAT Logistics Representative
- Contractors and Sub-Contractors' Managers
- Specialists, Support Services Providers and Repair Shops
- Central Maintenance Turnaround Planner

5.5.5 Activities

- Implement Turnaround EHS Plan
- Unit shutdown, blinding and clearing
- Reviews work scope add-ons and new discovered items
- Planning for additional work scope changes
- Housekeeping
- Daily turnaround progress update meetings
- Follow and update schedules with progress status
- Daily cost tracking and reporting
- Track manpower of all contractors
- Document all inspection reports and repairs
- Pre-Start-up Safety Reviews
- Punch listing prior to acceptance of completed work
- Commissioning and start-up

5.5.6 Tools and Processes

- EHS Plan
- Turnaround Schedules, Progress and Cost Control Systems
- Turnaround Execution Organization Chart
- Change Order Management System
- Turnaround Coordination Meetings

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- Pre-Startup Safety Review (PSSR) Procedures
- Unit Start-up Plans and Procedures
- Communication Plan
- Turnaround Management Process Procedures Manual

5.5.7 Reviews

Turnaround Execution Monitoring: Ensure that the turnaround plans are adhered to and execution process is safe and efficient.

5.5.8 Deliverables

- Completed Turnaround Work Scope
- Safety and environmental compliance
- Completed Capital Work and Tie-Ins
- Pre-Start-up Safety Review Documentation
- Facilities Started up and Ready for On-spec Production
- Clean and Safe Facilities
- Inspection Reports and Equipment History

5.5.9 Decision Milestone

Accept the operating facilities that are producing on-spec product. Proceed with Post-Turnaround and Evaluation Phase activities and start the performance evaluation process.

5.5.10 Decision Gatekeepers

- Plant Manager
- Maintenance Manager
- Turnaround Manager
- Area Production Superintendent
- Area Maintenance Superintendent

5.5.11 Phase Timing

The Execution Phase timing reflects the total turnaround downtime duration (feed/out – feed/in).

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5.6 Phase 6: Post Turnaround and Evaluation

5.6.1 Description

The Post Turnaround and Evaluation Phase's focus is to start demobilization of contractors and other contracted resources, complete all documentation, prepare final cost reports, and most importantly capture the lessons learned that could be utilized for the next turnarounds.

Post turnaround activities should be completed within 4-8 weeks depending upon the turnaround size and complexity. It is vital that the turnaround staff have sufficient time to complete post turnaround activities prior to their reassignment. Executing these phase activities in a thorough and timely manner will ensue efficient planning for the next turnaround.

5.6.2 Key Phase Objectives

Achieve on-spec production, demobilize all contractors, complete documentation and benchmark the turnaround results. Conduct performance evaluation and identify lessons learned. Develop and implement plans for improving performance of future turnarounds.

5.6.3 Principal Focus

- Safety
- Support Operations as Required
- Post Turnaround Activities e.g. Scaffold Removal, Insulation, etc.
- Clean-up of Facilities
- Demobilization of Contractors
- Disposal of Materials, Equipment, Etc.
- Inspection Reports
- Equipment History Records
- Documentation and as-Built Drawings per PSM and MOC Guidelines
- Contracts Close-Out Reports
- Final Turnaround Close-Out Report
- Performance Feedback from all Participants Including Contractors
- Lessons Learned and Recommendations for Future Turnarounds

5.6.4 Participants

- Plant Manager
- Maintenance Manager
- Turnaround Manager

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- Area Production Superintendent
- Area Maintenance Superintendent
- Reliability Engineer and Inspectors
- Project Engineer
- EHS Representative
- Turnaround Advisor
- Maintenance / Turnaround Planner
- Buyer
- CAT Logistics Representative
- Contractors and Sub-Contractors' Managers
- Central Maintenance Turnaround Planner

5.6.5 Activities

- Post Turnaround Activities e.g. Scaffold Removal, Insulation, etc.
- Demobilization of contractors
- Unit and lay-down area clean up
- Disposal of excess material
- Develop equipment history reports and document repairs performed
- Document all inspection reports
- Update the turnaround historical database
- Close the turnaround accounts
- Issue the final cost report
- Final Turnaround Close-Out Report
- Close out of all contracts
- Resolve any contractual conflicts or claims
- Get performance feed-back from all participants
- Collect Lessons learned and Recommendations for future turnarounds.

5.6.6 Tools and Processes

- Turnaround EHS Plan
- Turnaround Schedule and Plans
- Turnaround Management Plan
- Financial and Cost Tracking System

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- Control Budget
- PSM and MOC Guidelines
- Turnaround Management Process Procedures Manual

5.6.7 Reviews

Post Turnaround Evaluation Reviews: Evaluate the final turnaround performance results and compare those with the base Turnaround Management Plan. Identify gap areas, potential opportunities and implementation plans for recommendations.

5.6.8 Deliverables

- Cleaned Turnaround and lay-Down Areas
- Final Report of KPI Performance
- Report on Turnaround Management Process Effectiveness
- Lessons Learned and Recommendations for Future Turnarounds
- Implementation Plans for Recommendations and Improvements
- Post Turnaround Work List for Next Turnaround
- As-Built Drawings
- Documentation of Completed Work
- Financial Close-Out Report
- Final Turnaround Close-Out Report

5.6.9 Decision Milestone

Approve the Implementation Plan for recommendations based on the post turnaround performance evaluation and feed back from all participants including contractors.

5.6.10 Decision Gatekeepers

- Plant Manager
- Maintenance Manager
- Turnaround Manager
- Area Production Superintendent
- Area Maintenance Superintendent

5.6.11 Phase Timing

The Post Turnaround and Evaluation Phase should be completed within 2-8 weeks after the turnaround.

- Small 2-4 Weeks
- Medium 4-6 Weeks

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- Large 6-8 Weeks

6.0 REFERENCES

- Turnaround Management Process Procedures Manual
- Mosaic Turnaround Management Process Chart – Detailed

7.0 ATTACHMENTS

- Procedure Routing Sheet
- Process Flow Diagram
- Mosaic Turnaround Management Process Chart – Summary

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PROCEDURE ROUTING SHEET

☒ **Maintenance** ☒ **Administration** ☒ **Production**

Procedure Number: CRV-AD-0013	Maintainer: D. Sisco	Date Assigned: 02/01/08
Title: Phosphate Concentrates Turnaround Management Process		
Revision: 1	New:	Area & Plant: All Phosphate Concentrates

1. The attached procedure is being circulated for review, additions or corrections.
2. After the Superintendent designates a Maintainer, the Maintainer writes and/or updates the procedure while discussing changes with the Unit/Department Supervisor/Manager.
3. After the Unit/Shift Supervisor/Manager approves the procedure, they sign off on the routing sheet and send the procedure to the Unit/Department Superintendent and/or Manager who reviews the procedure.
4. The Final Reviewer evaluates the procedures and sends modifications to the Maintainer.
5. The Maintainer incorporates the modifications and submits the procedure for final approval to the Final Reviewer. If the procedure is not approved, it is sent back to the immediate Supervisor and is routed through the process again until final approval is given.
6. The document is then sent back to the Coordinator for placement into the appropriate manual, publishing in the Procedure Library or on the Web Page. Finally the routing sheet is filed in the Coordinator's designated area.

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Reviewer	Position	Signature	Date
Maintainer	Dennis Sisco		
Reviewer	Mitch Bussell		
Reviewer	David Bryant		
Reviewer	Josh Wheeler		
Reviewer	Steve Douglas		
Reviewer	Pat Burris		
Reviewer	Malcolm Osenton		
Reviewer	Roland Baudoin		
Reviewer	Will Fields		
Reviewer	Louis Chaplain		
Reviewer	Mike Davis		
Final Reviewer	Prat Bose		

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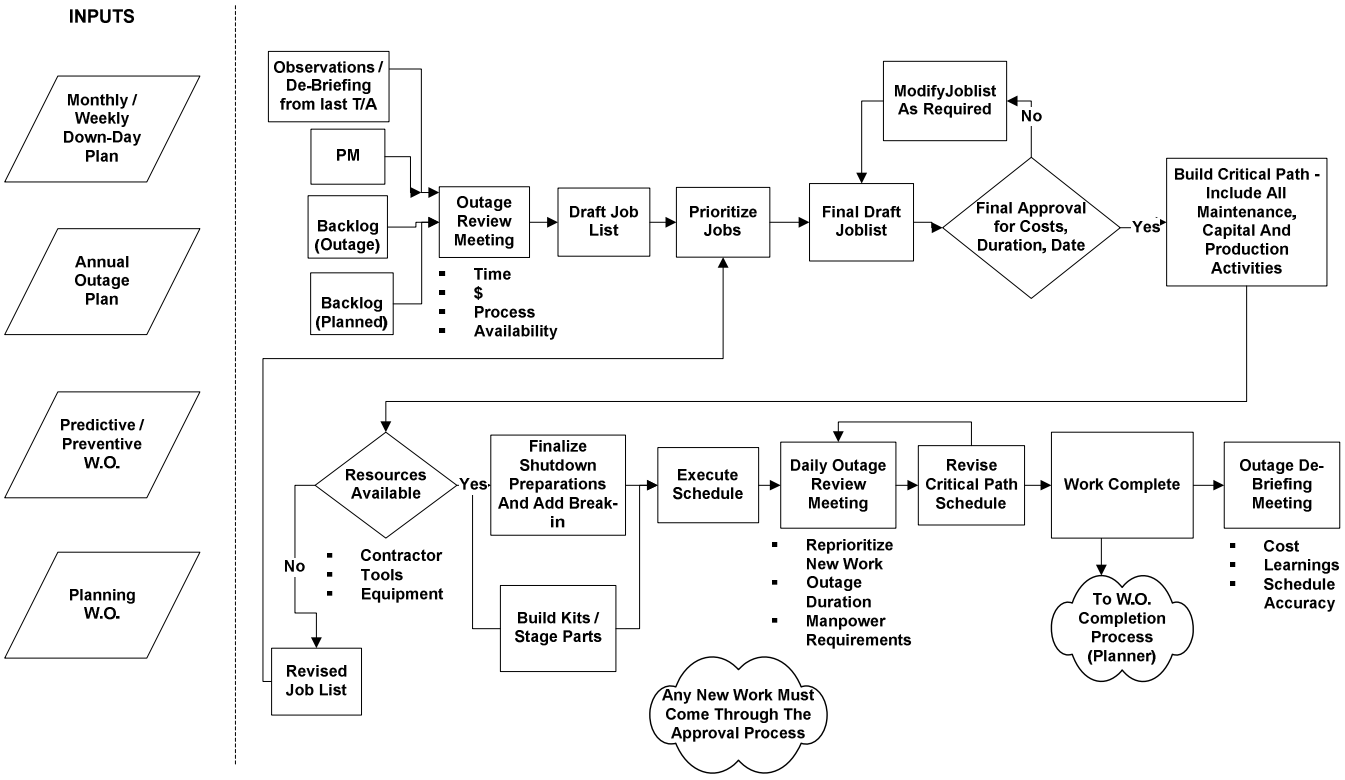
Turnaround Management Process Flow Diagram

Conceptual Development ***Plan***



Plan ***Do*** ***Review***

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TMPP-B01 BUSINESS PLANNING

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Business Planning

Business Planning is the initial important phase in setting the stage for successful turnarounds. As we look at turnarounds from a broader outlook, we must recognize that the turnarounds are not merely maintenance or operational functions, but are a significant component of the company's business planning strategy.

Because of disruptions to production, turnarounds have a major impact on the company's business and marketing plans. For this very reason, Mosaic's business and marketing groups continuously and significantly influence turnarounds. As such it is important that company's business and marketing groups should actively participate during the turnaround planning process.

Early involvement and participation of the business and marketing groups will ensure that there are less surprises when the turnaround planning teams are told about changes in turnaround budgets, shifting of execution dates and different downtime requirements. Many of these decisions are typically influenced by company's business and marketing groups. These decisions may seem unpleasant at some time, but in most cases these have compelling business justifications at the corporate level to recommend those turnaround changes.

4.2 Financial Considerations

Turnarounds have traditionally been considered as major plant maintenance and production events. More recently, turnaround costs have also emerged as a significant

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criterion in judging turnaround success. As such, companies' financial groups have started demanding fiscal discipline in turnaround execution.

Since turnarounds significantly impact bottom line profits, company's financial groups have begun to demand that turnarounds be done in a cost efficient manner and must conform to Mosaic's budgetary guidelines and cycle. The Turnaround Management Teams must closely work with the financial groups in the development of realistic budgets and tracking cost to ensure that the turnaround get completed within the approved budgets.

The real challenge for the Turnaround Management Teams is to achieve an optimum balance between the company's business and financial goals and the plant's operational and mechanical integrity needs.

4.3 Outside Influences on Turnarounds

In addition to all plant functions, there are other outside influences that have a significant impact on the turnaround planning process. Since some of these outside influences work independently, we cannot control the timing of their actions or the resulting impact on turnaround performance. The following are examples of outside influences:

- Regulatory agencies, e.g., OSHA, EPA, etc.
- Financial and market analysts
- Company stockholders
- Civic organizations
- Local governmental authorities
- Insurance companies
- Large equipment vendors
- Labor unions
- Competition and market conditions
- Supply channels and logistics

All of the above institutions influence turnarounds, however, turnaround teams have little influence on them. Therefore, the real challenge for turnaround teams is to try to understand or predict the potential actions or requirements that could impact turnaround planning or execution. By recognizing these outside influences, we can initiate a dialogue with them wherever possible to fully understand their potential actions and possible impacts on turnarounds.

4.4 Business Influences on Turnarounds

The company's business plans and the current outlook constantly influence a turnaround's timing and to some extent its execution strategy. The Business Planning Phase provides an opportunity for the turnaround teams to have a clear understanding as to what flexibility the Business and Marketing Groups like in shifting the turnaround start dates.

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By understanding each other's needs early, both the business and plant groups incorporate these considerations in the turnaround planning. This will ensure that any changes by the business group to the turnaround start date would have minimal impact on turnaround execution performance.

When the profit margins are high, company may seek to delay the turnaround or reduce the turnaround duration in order to capture the business opportunity. Such decisions, at the same time must be balanced by considering plant's mechanical integrity needs and related executions considerations *e.g.* manpower availability, equipment, etc..

For example, business opportunity may support a turnaround delay by couple of months, however limited availability of a large crane for a big lift could prevent any changes to the schedule. Similarly during low margin business cycle, it would be prudent to stretch the turnaround duration by working normal work shifts hours and not paying premium overtime.

4.5 Synchronization with Company's Business Plan

Each turnaround has a marketing and financial impact on company's business plan and financial outlook. Since turnarounds result in temporary production disruption, the company has to make adjustments so that company's commitments to its customers have no or minimal impact. This stoppage of production also results in loss of revenues to the company.

Each plant has to keep these issues in consideration so that the supply and financial impact of the turnarounds are communicated to the corporation during the Business Planning Phase. Since the corporation has a total picture of all the facilities, they will work with the plants to synchronize the turnarounds in order to support company's business plan and current financial outlook.

Each plant has a responsibility to communicate their turnaround plans and any changes to the corporation so that these turnarounds support company's business plans.

4.6 Capital Project Integration

During the Business Planning Phase, the Turnaround Management Team should get input from the Project Group about the capital projects that need to be integrated with the upcoming turnarounds. The capital projects' completion dates will have a great influence on the turnaround timing and start date.

The capital project and turnaround teams with the help of corporate and plant management must jointly decide the turnaround start dates. Once the turnaround start date has been established, the project and turnaround groups must look closely to integrate their plans and contracting strategies in order to have efficient execution.

Any disconnect in identifying a jointly agreed date could have a disruptive effect on the performance of the turnaround. Both project and turnaround teams have a responsibility to work together so that all essential steps are accomplished to achieve the turnaround start date. These steps may include:

- Order long lead equipment early
- Design packages and IFC drawings
- Procurement of bulk materials

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- Prefabrication of pipe, etc.
- Contracting and contractor selection
- Detailed planning
- Construction equipment and tools
- Safety plans for safe execution

4.7 Business Planning Participants

Since Business Planning is the earliest turnaround planning phase, the Site Leadership Team must ensure that appropriate company resources are identified in order to perform the business planning activities. Ideally, this turnaround phase should start 11-12 months before the turnaround. It may be too early to assign full time staff to the turnaround team, however, the Site Leadership Team should be designated to participate in the Business Planning Phase.

There is a definite need for the turnaround leadership to establish contact with company's business and marketing groups to fully understand their priorities. Some of the key participants that need to be involved during the Business Planning Phase include the following:

- Plant Manager
- Financial and Marketing Groups
- Operations and Production
- Maintenance
- Reliability / Inspection
- Turnaround Manager
- Environment, Health and Safety

4.8 Review Checklist

- Business Planning is an important initial phase of the turnaround planning in order to fully understand company's business needs related to a turnaround.
- The Turnaround Management Team must recognize the outside influences that could directly or indirectly influence the turnaround planning and execution.
- Both the company's business groups and the plant management must recognize, respect and accommodate each other's priorities and needs.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-B02 MARKETING CONSIDERATIONS

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Marketing Considerations

For turnarounds to be successful, efficient and cost effective, the Turnaround Management Teams must understand and incorporate the needs of corporate marketing groups into the turnaround plans. This can be achieved if marketing group's long-term commitments and short-term flexibility considerations are incorporated into the turnaround plans. The sooner these issues are recognized, the better it is for turnaround planning.

The Business Planning Phase provides a forum for constructive dialogue between the marketing group and the plant's mechanical integrity and operations teams to understand each other's needs and to establish a realistic framework for turnaround planning. To achieve an optimum balance, the turnaround planning should be flexible enough to provide both the companies' financial and marketing groups some maneuvering room in making last minute changes to turnaround timing. At the same time, every participant should understand that this added flexibility comes with a potential cost impact on the turnaround budget.

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4.2 Competition and Market Trends

During the Business Planning, the Turnaround Management Team must recognize the current market trends and competition so that the marketing considerations are reflected in turnaround plans. This initial turnaround planning phase is designed to incorporate and integrate the company's marketing needs and the plant's operational values into the turnaround planning. Some of the issues that influence the turnaround planning from the marketing perspective include the following:

- The company's commitments to the clients
- Marketing's desired flexibility to move turnaround dates
- Changing business environment
- Fluctuations in profit margins
- Industry trends and changing product demands
- Company's on-going commitments to meet clients' needs

4.3 Marketing Driven Schedule Flexibility

A formal Business Planning Phase ensures that, the concerns and needs of the business and marketing groups get completely communicated to the turnaround planning group. As logical as the marketing decisions may be, if made late in the planning process, they could disrupt the planning momentum and adversely impact turnaround execution results. The ultimate solution lies in the early identification of these marketing needs and evaluating their potential impact on turnaround planning and execution.

4.4 Turnaround's Impact on Customers

Since the turnarounds result in disruption of production, the company has to make arrangements and ensure their product commitments to the clients are met. The company may have to divert products from other facilities and in extreme cases obtain from other outside resources.

To make these transitional arrangements, the marketing groups needs to know early the turnaround plans and the plant's downtime when there is no production. In many cases, contractual arrangements require that the company provides advance notifications to clients about planned turnarounds, and that the clients are regularly informed about turnaround completion status.

All the above issues emphasize the importance that turnarounds are effectively planned and completed on schedule. This will ensure that company's commitments to clients are met without costly supply disruptions.

4.5 Review Checklist

- The long-term turnaround cycle for the company must reflect marketing group's needs and priorities.
- The turnaround planning should incorporate the feasibility that the marketing group may need to reasonably adjust the turnaround start dates.

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- There should be continuing dialogue between the Marketing Group and Turnaround Teams during both the planning and execution phases in order to keep the customers informed about turnaround's impact on customer supplies.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-B03 LONG-TERM TURNAROUND CYCLE

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Long Term Turnaround Cycle

A Long-Term Turnaround Cycle is one of the key documents developed during the Business Planning Phase. This Long-Term Turnaround Cycle should be developed keeping in consideration of Mosaic's business plans, plant's mechanical integrity and operational reliability requirements, and capital projects' implementation schedule. This document should show the turnaround cycle for various units for the next 5 years. For each plant unit the Long-Term Turnaround Cycles should show the estimated turnaround duration and the time between scheduled turnarounds. An example of a Long-Term Turnaround Cycle is shown in the Attachments.

This Long-Term Turnaround Cycle provides valuable information to the Turnaround Management Team as to the anticipated turnaround work loads for the next five (5) years. In its development, following issues are taken into consideration:

- Plant's mechanical integrity needs
- Customer needs and market / product commitments
- Company's business and financial plans
- Operational reliability goals
- Plant's past operating performance records
- Planned capital and revamp projects
- Catalyst life projections
- Equipment inspection and certification requirements

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- Safety, health and environmental performance and compliance to regulatory requirements

4.2 Synchronizing with Other Plants

Since Mosaic is a large multi-facility company, each plant's Long-Term Turnaround Cycle must keep in consideration Corporate Business and Financial Plans. In addition, company's commitments to its customers also have to be carefully considered in scheduling turnarounds at various company plants.

To achieve the above objectives, each plant submits their turnaround plans for the next 5 years to the corporate office. These turnaround schedules are then looked from company's business, financial and customer commitments perspectives. In case there are conflicts with specific turnaround, these are mutually resolved by having dialogue with the plant's management.

4.3 Turnaround Cycle Applications

The balancing of various departments' needs and different business / marketing priorities is the biggest challenge facing the plant management during the Business Planning Phase. By mitigating and objectively reviewing the needs of various groups, an optimum Long-Term Turnaround Cycle should be developed. This should be reviewed on an on-going basis and adjusted to reflect the company's current plant and business requirements.

Even though flexible to meet changing business conditions, the turnaround cycle should not be altered too often and that any changes must get the approval of plant and corporate management. Here are some of the benefits and applications derived from a good Long-Term Turnaround Cycle:

- Integration of the company's business and marketing needs
- Identify peaks and valleys of turnaround work loads
- Assists in company's cash flow projections
- Assessment of company's turnaround resource requirements
- Influences in the development of contracting strategies
- Turnaround plans look at the next 2-3 turnaround cycles in order to optimize the work scope
- Helps to identify opportunities to increase the duration between turnarounds
- Facilitates benchmarking and compares performance with peer and pacesetter companies

4.4 Mechanical Integrity

In most cases, the turnarounds are driven by plant's mechanical integrity needs. The wear and tear during the operations, necessitates the need for detailed inspection, perform necessary repairs and restore plant's mechanical integrity.

Inspection department working closely with the maintenance and operations should develop an ideal turnaround cycle to address plants' mechanical integrity needs. In order

to ensure that all plant's repair requirements are identified, it is recommended that a comprehensive Mechanical Integrity Assessment should be performed 8-10 months before the turnaround. This assessment should lead to recommendations along with justifications for potential work scope that needs to be performed to achieve optimal mechanical integrity of the plant. These recommendations are then reviewed by the work scope review team for their approval and inclusion in the final work scope list.

4.5 Integrating Capital Program Schedules

In the development of plant's Long-Term Turnaround Cycle, the turnaround planning group should keep in consideration plant's capital project plans. Since most of the capital projects require tie-ins and/or more comprehensive integration, their completions have to match-up with the turnaround schedules.

As part of the Business Planning Phase, both the capital project and turnaround teams must review their plans and ensure that the turnaround schedule accommodates their mutual needs. This may require changes to the plant's current Long-Term Turnaround Cycle.

Once the new turnaround dates have been agreed, then it becomes the responsibility of both the capital project and turnaround teams to take necessary steps to complete their work scope in order to meet the target turnaround start dates. Any delays could be disruptive to turnaround execution in addition to company's business/financial outlook.

4.6 Corporate Approval for Turnaround Schedule Changes

The Plant Manager is required to keep the plant's Long-Term Turnaround Cycle current based on plant's mechanical integrity needs and operational reliability considerations. Any proposed changes to this schedule should be thoroughly reviewed and justified by the Site Leadership Team.

If the change to the plant's Long-Term Turnaround Cycle is essential then it must be communicated to the corporation for their approval. Only after the corporate approval, the change becomes official and reflected in company's and plant's Long-Term Turnaround Cycle.

4.7 Review Checklist

- The Central Turnaround Group is responsible to develop and maintain company's Long-Term Turnaround Cycle.
- The Long-Term Turnaround Cycle provides valuable information to the Turnaround Management Team about the anticipated workload for the next 5 years.
- Any changes to the turnaround dates should be communicated to company's business and Central Turnaround Group to evaluate its impact on other turnarounds company's business plans.

5.0 REFERENCES

- Turnaround Management Procedures Manual

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6.0 ATTACHMENTS

- Mosaic's Sulfuric Acid Long-Term Turnaround Cycle

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TMPP-C01 STRATEGIC TURNAROUND PLANNING

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Strategic Turnaround Planning

Strategic Turnaround Planning is the essential front-end loading step to create a high performance framework to efficiently plan, organize and execute successful turnarounds. It is a creative and participative process, initiated at the earliest turnaround planning phase to focus on issues that would ensure turnaround success.

Without the benefit of a clearly developed and focused turnaround strategy and goals, the turnaround planning can be marred with departmental conflict and competing priorities. Strategic Turnaround Planning helps to map out an optimum plan and roadmap for achieving Mosaic's business goals and operational objectives.

4.2 Purpose of Strategic Planning

The most important purpose of Strategic Turnaround Planning is to establish a turnaround framework and roadmap for detailed planning, based on company's current business priorities and a facility's operational needs. Strategic planning provides a framework for all company organizations and key staff to assess turnaround needs, identify risks, define challenges and opportunities, and to decide on actions based on a shared set of values. Strategic planning results in an optimum plan for all participants based on commonly accepted performance criteria, priorities and planned actions.

Strategic planning increases the capacity of the organization to implement proactive management initiatives and planning concepts in order to achieve the highest turnaround results. It also helps the organization develop, organize and utilize a better understanding of the overall environment in which turnarounds are executed, especially related to business, customer, stakeholder and other influences. Figure 1 shows the

relationship of strategic planning and the turnaround team's ability to influence the turnaround performance.

Strategic Turnaround Planning helps to create a common understanding among all participants about the importance, needs and actions required to facilitate successful turnarounds. Strategic planning results in the development of a Turnaround Management Plan which acts as a guiding document in the planning, organizing and executing of plant turnarounds.

4.3 Strategic Planning Process

Strategic Turnaround Planning starts at the completion of the Business and Conceptual Development Phase. During the strategic planning, all key turnaround participants ensure that company's business and plant's operational goals get translated into viable plans that would ensure efficient execution.

Strategic Turnaround Planning is not an event but it is an important phase of Mosaic's Turnaround Management Process. As such, it can be demanding, time consuming and requiring multiple resources from different departments.

The Strategic Turnaround Planning process as outlined here is developed to meet Mosaic specific challenges in managing turnarounds. Strategic planning requires creativity, analysis, honesty and a true desire to reach the highest performance goals. The process here puts major emphasis on reality-checks, risk assessment, value-driven decisions and focuses on a synergistic approach.

4.4 Alignment of Company's Business and Turnaround Goals

Turnarounds should be looked at as an integral part of the company's business plan and must contribute to the company's success. As part of Strategic Turnaround Planning, the turnaround team must align turnaround goals and plans with the company's current business plans, customer needs and financial goals. The turnaround should result in the plant operating efficiently in order to meet customer needs.

It is of the utmost importance that the turnaround performance objectives are agreed to by all stakeholders and key participants. This will ensure that everyone is focused on executing the turnaround based on common success criteria. Examples of turnaround goals are attached.

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As part of this alignment, the Turnaround management Team should ensure that the turnaround planning focus is to achieve highest operational reliability by achieving plant's mechanical integrity goals. Operational reliability and mechanical integrity goals should be clearly established and communicated to develop a meaningful turnaround work scope.

4.5 Strategic Planning Deliverables

The Strategic Turnaround Planning results in the development of several important deliverables. These informative documents help in keeping the turnaround participants focused during the detailed planning and execution phases. Some of the strategic planning deliverables include: (some examples are attached)

- Turnaround Performance Criteria
- Turnaround Objectives and Key Performance Indicators
- Critical and Risk Issues
- Success Initiatives to Maximize Turnaround Performance
- Work Scope Criteria, Development Plan and Responsibilities
- Capital Project Integration Approach
- Guidelines to Develop Contracting Strategies
- Organization Chart and Responsibility Matrix
- Plan to Plan the Turnaround with Key Planning Milestones

4.6 Strategic Planning Timing

Depending on the size and complexity of the turnaround, the Strategic Turnaround Planning process should be initiated 7-11 months before the turnaround start date. The ideal timing will depend upon the size, complexity and frequency of the turnaround. The Turnaround Management Team should also keep in mind that effective Strategic Turnaround Planning can take 1-3 months depending upon the turnaround complexity and number of participants involved.

The Plant Management should not hesitate to start the strategic turnaround process early as it will take time to implement the initiatives and actions identified during the Strategic Turnaround Planning.

4.7 Strategic Planning Participants

Participation from key departments is essential to ensure the success of the Strategic Turnaround Planning. To layout the framework for effective Strategic Turnaround Planning, a Site Leadership team should be identified. At a minimum, the Strategic Turnaround Planning should have following participants:

- Plant Manager
- Maintenance Manager
- Turnaround Manager
- EHS Representative

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- Area Production Superintendent
- Area Maintenance Superintendent
- Reliability Engineer
- Project Engineer
- Buyer
- Maintenance / Turnaround Planner
- Finance and Business Groups Representatives
- Turnaround Advisor

4.8 Review Checklist

- Strategic turnaround planning is performed with the participation of the turnaround team representing key company departments.
- Major effort during the turnaround strategic planning is to develop work scope and gather accurate information for schedule development.
- Review the turnaround execution strategy.
- Work List is thoroughly reviewed and approved by the turnaround management team.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Turnaround Goals and Objectives
- Performance Measurement and KPI's

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TMPP-C02 TURNAROUND MANAGEMENT PLAN

1.0 PURPOSE

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2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Turnaround Management Plan

The Strategic Turnaround Planning process results in the formalization of several decisions and actions, and in the development of several planning documents. To effectively manage and communicate this information to all turnaround participants, it is essential to consolidate all these deliverables into a single document, the Turnaround Management Plan.

The Turnaround Management Plan is a high level planning document developed specifically for a turnaround to ensure effective planning and efficient execution without traditional organizational conflicts and constant change in directions.

4.2 Purpose and Objective

While Strategic Turnaround Planning is a key planning mechanism to accomplish turnaround objectives, the Turnaround Management Plan is the compilation of turnaround information in order to precisely guide the detailed planning and execution phases.

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The Turnaround Management Plan thoroughly defines how the Turnaround Management Team plans to execute and manage the work scope in order to achieve company's business goals and turnaround objectives. It represents the highest order of turnaround execution planning and establishes the governing framework and strategy for detailed planning and execution.

The Turnaround Management Plan becomes a communication tool between the Turnaround Management Team and all other turnaround participants. After approval from the Plant Management, it serves as an agreement and commitment by all participants to follow a common roadmap and accomplish established turnaround goals.

As the turnaround information develops further in clarity and detail, the Turnaround Management Plan is updated to reflect the new turnaround plans and execution approaches.

4.3 Turnaround Management Plan Contents

The Turnaround Management Plan and the details included in it will vary depending upon the size and complexity of the turnaround. To serve a useful purpose the Turnaround Management Plan should have some mandatory sections. Additional sections may be added to meet specific turnaround circumstances such as integration with capital projects, etc. The following is a list of recommended sections that should form the core of a typical Turnaround Management Plan:

- Turnaround Basis and Summary
- Company's Turnaround Vision and Expectations
- Turnaround Goals and Performance Indices
- Turnaround Work Scope
- Critical and Risk Areas
- Turnaround Organizations and Responsibility Matrix
- Safety, Health and Environmental Plan
- Turnaround Schedules and Milestones
- Turnaround Budgets and Cost Estimates
- Materials Management
- Contracting Strategy and Plan
- Quality Control and Inspection Plan
- Operations Shutdown and Start-up Plans
- Turnaround Logistics Plan
- Communications and Information Management Plan
- Training and Orientation Program

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4.4 Plan to Plan the Turnaround

The turnaround planning process stretches over 8-12 months depending on the size and complexity of the turnaround. During this planning phase several activities take place that need to be effectively planned and managed.

The Plan to Plan the Turnaround is developed in a Gantt chart in order to show inter-relationships between all planning functions and activities. Accomplishing these activities as planned and meeting the completion milestones enhances the effectiveness of the planning effort. This document guides the Turnaround Management Team and other participants to systematically prepare for the turnaround, develop the work scope, staff the organization, timely procure the materials, select the contractors, etc.

4.5 Development and Update Responsibility

The Turnaround Management Team is responsible for the development of Turnaround Management Plan by getting input from all participants and consolidating all turnaround related information in this single-source guiding document.

The Turnaround Manager is responsible to keep this plan updated and report progress status and any deviations to the Plant Management on a weekly basis.

The effectiveness and usefulness of this document to a large extent will depend upon the conciseness and exactness of information specific to a particular turnaround and its intended audience.

4.6 Approval and Implementation

The preliminary Turnaround Management Plan should be completed during the Strategic Turnaround Planning Phase. The finalized plan should be submitted to the Site Leadership Team for their approval. The final and approved Turnaround Management Plan establishes a baseline that the Turnaround Management Team is committed to accomplish all the planning and execution phase activities. At the same time it also commits the Site Leadership Team to provide the necessary resources to accomplish tasks laid out in this Turnaround Management Plan.

4.7 Post Turnaround Performance Comparison

The Turnaround Management Plan also serves as a baseline document to compare the effectiveness of the planning phase effort. Its weekly updates and final status at the end of the turnaround provides a measure of the actual performance as compared to the baseline. It helps to identify lessons learned and guides in the improving planning and execution for future turnarounds.

4.8 Review Checklist

- The Turnaround Management Plan is a single source document that contains all high levels of information pertinent to a specific document.
- It is used as a guiding and reference document for all participants as they develop detailed turnaround plans and execution strategies.
- At the end of the turnaround, the actual performance can be benchmarked by referring to the Turnaround Management Plan.

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- The information included in The Turnaround Management Plan evolves as the planning progresses.
- It is the responsibility of the Turnaround Manager to keep this information current with the help of all turnaround team members.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-C03 RISK ASSESSMENT AND MITIGATION

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Risk Assessment and Mitigation

The plant turnarounds are inherently known for risks and surprises that could undermine performance and turnaround success. The goal of Risk Assessment and Mitigation is to recognize the inherent risks and potential external adverse roadblocks, and to develop strategies/solutions to effectively mitigate the risks.

The challenge for the Turnaround Management Team is to be able to foresee these risks and potential problems that could arise from weak internal systems/processes and/or external circumstances beyond the control of the Turnaround Management Team. The Risk Assessment and Mitigation Plan is implemented as part of the turnaround strategic initiatives in order to stay proactive and eliminate roadblocks to turnaround success.

4.2 Critical and Risk Issues

One of the key objectives of Strategic Turnaround Work Scope Phase is to identify those critical and risk issues that could adversely impact planning effectiveness and prevent company's abilities to achieve turnaround goals. By getting input from key participants including contractors and vendors, the Turnaround Management Team should be able to shake out the known and potential risks issues that could impede turnaround results.

Once these critical risks are recognized, then the Turnaround Management Team should ensure that the planning effort and execution strategies are focused on effectively mitigating these risks without adversely impacting the turnaround performance. The following list is an example of typical turnaround critical and risk issues.

- Shortage of dedicated company staff to plan and supervise turnaround

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- Major repairs or replacement of major equipment; likely critical path
- Late engineering drawings
- Materials/equipment requiring fabrication during the turnaround window
- Shortages of qualified welders in the same area
- New computerized planning and controls system
- Turnaround during major holidays or sporting season

4.3 Identification of Turnaround Risks

The Strategic Planning and Work Scope Phase provide an ideal opportunity for the Turnaround Management Team to identify turnaround risks, potential problems and weak areas. It is important that in the identification turnaround risks, the Turnaround Manager solicits the input of all turnaround team members and from other departments that may not be actively involved in the turnaround planning at that time.

The Turnaround Manager should also review the performance of previous turnarounds and based on the past critique reports, should identify chronic problems that have impeded turnaround results. These risks should be closely evaluated to determine if these problem areas could still be potential roadblocks to turnaround success. If the answer is yes then those should be included in the turnaround risks.

The Turnaround Management Team should solicit the input of the Site Leadership Team and wherever possible from major contractors in identifying the turnaround risks.

Even though the risks identification turnaround process starts from the earliest planning phases, but it is a continuous process and the Turnaround Risk List should be modified to reflect new risks and by removing those which have been addressed and mitigated. See Attachments showing typical Risks, Potential Problems and Weak Areas.

4.4 Risk Assessment and Mitigation

The Turnaround Manager with the help of the Turnaround Management Team should closely review these risks, potential problems and weak areas and develop a plan to timely mitigate these risks before these become road blocks to turnaround success. With the input of the Turnaround Management Team, these risks should be categorized for their severity and potential impact on turnaround results. These risks can be categorized into following priorities:

H = High Risks

M = Medium Risks

L = Low Risks

Based on these severity priorities, responsibilities and target dates should be assigned to resolve these risks. In some cases, a task team may be assigned under designated leader to come up with the solution.

The Turnaround Manager has a key responsibility that the Risk Mitigation Plans are taken seriously and the target dates are met by the responsible persons. Any trends of missing target dates and ineffective solutions are signals of turnaround failure and must

be promptly addressed and if necessary brought to the attention of the Site Leadership Team.

4.4.1 Contractor's Role v. Risk Mitigation

Since contractors are an integral part of the turnaround planning and execution, their active participation is essential to developing solutions and mitigating some of these risks. Contractors input should be solicited to address common turnaround risks such as:

- Shortage of experienced crafts
- Poor productivity and low tool line
- Delays in getting materials from warehousing
- High cost of construction equipment
- Poor cost tracking and inaccurate progress reporting
- Crafts not following the break and lunch schedules

4.5 Review Checklist

- Turnaround risks, potential problems and weak areas should be identified during the earliest turnaround planning phases.
- Review critique reports from previous turnarounds to recognize chronic problems that could impact upcoming turnaround.
- Assign and enforce target dates for mitigating risks.
- Continuously evaluate and update the risks and mitigation plans.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Risks, Potential Problems and Weak Areas

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TMPP-C04 TURNAROUND SUCCESS INITIATIVES AND STRATEGIES

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Turnaround Success Initiatives and Strategies

Once the turnaround goals are established and potential critical and risk issues are identified, the focus of the Strategic Planning and Work Scope Phase moves on to develop initiatives and strategies that should ensure a successful turnaround. With the input from key participants, the Turnaround Management Team should identify proactive actions and success initiatives that will eliminate risks and lead to exceptional turnaround results.

This is also an opportune time to identify industry best processes and practices which are suitable to enhance the performance of the upcoming turnaround. As new ideas and initiatives are identified and accepted, the Turnaround Manager should ensure that accountability and leadership for their implementation are also assigned.

Examples of Turnaround Success Initiatives are shown below:

- Define work scope 10 months prior to turnaround
- Assign a full time Turnaround Manager to manage the turnaround
- Implement Productivity Improvement Program with support from contractors
- Readily available safety permits without any lost time for crafts
- Assignment of a senior Material Coordinator to procure and manage all capital project materials and vendor shops
- Subcontract alloy welding to specialized subcontractors

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- Implement communication improvement plan and conduct team building sessions

4.2 Developing Success Initiatives and Strategies

The Turnaround Manager with the input of Turnaround Management Team and outside expertise (if necessary) develops Success Initiatives and Strategies that will help to overcome turnaround risks and lead to turnaround success. The major focus of this effort is to fully engage the company staff and leverage from their experience and expertise in the development of Success Initiatives and Strategies for pacesetter turnaround results.

The initial solicitation for the Success Initiatives and Strategies should start during the Business Planning and Strategic Planning Phases. During the Strategic Planning Phase, input should be solicited from all participants, based on their past experience and knowledge of challenges facing the upcoming turnaround. After the Success Initiatives and Strategies are defined, these should be categorized by departmental functions and proper responsibilities are assigned.

4.3 Prioritization and Benefit Assessment

The Success Initiatives and Strategies should be further reviewed to assess potential benefits that could be derived from their implementation. This is an essential exercise in order to establish implementation priorities. Since most of the turnarounds have limited resources, it is imperative that the Turnaround Management Team's primary focus should be on initiatives that offer maximum returns and benefits to the turnaround.

This benefit assessment process should lead to establishment of priorities to the Turnaround Success Initiatives and Strategies, *e.g.:*

- High
- Medium
- Low

The next step is to assign implementation responsibilities along with target completion dates. This document should be reviewed on a weekly basis and its progress status should be reported to the Site Leadership Team. Attached is an example.

4.4 Contractors' Participation and Input

Contractors bring valuable experience in planning and executing turnarounds. As contractors are selected, their staff should be engaged in providing input to the turnaround planning effect. Contractor Alignment Sessions provide an effective forum to solicit input from the contractors to further expand the list of Success Initiatives and Strategies.

Contractors input will provide their valuable perspective to this list of Success Initiatives and Strategies as contractors have vast experience in executing turnarounds with different clients. The Turnaround Management Team should use their input to create a synergistic work environment where contractors are committed to actively implement these strategic initiatives that would lead to turnaround success.

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4.5 Review Checklist

- As part of the Strategic Planning and Work Scope Phase, the Turnaround Management Team is responsible to develop Turnaround Success Initiatives and Strategies that will ensure pacesetter turnaround results.
- These success initiatives and strategies should be prioritized and responsibilities assigned in order to achieve timely implementation.
- After the contractors' selection, their input should be specified to identify initiatives and actions that will lead to safer higher performance.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Turnaround Success Initiatives and Strategies

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TMPP-C05 WORK SCOPE DEVELOPMENT

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

The purpose of this chapter is to completely and timely define the turnaround work scope, in order to develop integrated expense and capital turnaround execution plans. The Turnaround Management Process Procedures identify the mechanism to approve the turnaround work scope and to effectively manage the changes and add-ons.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Work Scope Development

The work scope development process for a turnaround begins immediately after the completion of the last turnaround. The turnaround closing reports identifies some of the work scope which needs to be accomplished during the next turnaround.

The major effort to define the turnaround work scope should begin 6-11 months before the turnaround, depending upon the turnaround size and complexity. Some of the principal considerations in turnaround work scope development are:

- Identify the work scope criteria
- Establish work scope development guidelines and formats
- Establish work scope development cut-off dates in consultation with responsible parties

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- Identify work scope development responsibilities
- Establish a Work Scope Review Team
- Assign priorities to work orders
- Strategies to effectively plan for critical and risky work items

4.2 Work Scope Development Guidelines

To effectively plan and efficiently execute the turnaround, one of the major focuses during the planning phase should be to define the turnaround work scope. The Turnaround Management Team should clearly identify responsibilities and mechanism to develop, approve and prioritize the work scope.

The potential turnaround work scope can be identified by any one in the plant. However, for approval and inclusion in the final turnaround work scope it should meet rigid qualification criteria and go through a systematic approval cycle.

The work request originator must have a clear understanding of the turnaround work scope criteria and approval process. Any of the following groups can identify the potential work requests and forward these to the Turnaround Management Team for their review and approval:

- Operations/Production
- Maintenance
- Electrical and Instrumentation
- Reliability and Inspection
- Rotating Equipment/Machinery
- Health, Safety and Environmental
- Technical and Process

4.3 Turnaround Work Scope Criteria

In order to optimize the turnaround cost and schedule, the Turnaround Management Team should ensure that only those work scope requests should be approved which meet the established Turnaround Work Scope Criteria. The Turnaround Management Team should review and finalize the Work Scope Criteria for each turnaround to ensure that it addresses the turnaround-specific considerations.

As a rule, only those work requests should be included which cannot be performed during the normal operations and are essential to ensure the plant's safety, environmental compliance, mechanical integrity and cost-efficient operations.

The work scope requests that do not meet mandatory requirements but offer a potential opportunity, must be justified and get approval by the Site Leadership Team.

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For qualification and inclusion in the turnaround work scope, the work requests should meet the following work scope criteria:

- Work scope which cannot be done during the regular operations (mandatory)
- Exceptional work or potential higher risk for unplanned shutdown if performed during the normal operations
- Mechanical integrity work items that ensure operational reliability between scheduled turnarounds
- Compliance to meet the regulatory EPA, PSM, HAZOP requirements
- Capital work tie-ins and modifications with existing facilities which cannot be done during the normal operations.
- Regulatory certification requirements for certain equipment, e.g. boilers, etc.
- Catalyst change out due to life of catalyst
- Work requests that improve plant performance/yield
- Electrical and instrument upgrades and modifications
- Work items that are relatively safe and less environmental risk during the turnaround compared to if performed during normal operations
- Opportunistic work that could lead to more efficient facilities
- Corporate mandated work items

4.4 Work Scope Development Responsibilities

In the earliest turnaround planning process, work scope development should be the key focus of the Turnaround Management Team. The Turnaround Manager is ultimately responsible to coordinate the work scope development process.

Since the turnaround work scope encompasses several departments, a well coordinated effort is essential to define 80-90% of the turnaround work scope 6-11 months before the turnaround start date. The Turnaround Management Team should be responsible to monitor the work scope development process and to establish necessary guidelines and assign responsibilities.

4.5 Work Scope Review Team

For timely and complete definition of turnaround work scope, it is recommended that a cross-functional Turnaround Work Scope Review Team should be established. This team becomes the focal point in establishing the work scope criteria, assigning responsibilities and in approving the turnaround work requests for inclusion in the final work scope.

Depending upon the size and complexity of the turnaround, this review team should be established and start working 6-11 months before the turnaround. This early assignment of a key cross-functional group will ensure that the turnaround work scope is firmed up 5-9 months before the turnaround. The Work Scope Review Team will be responsible for accomplishing the following tasks:

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- Establish turnaround specific work scope criteria
- Assign work scope development responsibilities
- Decide work scope cut-off dates in consultation with responsible groups
- Ensure early work scope finalization and planning considerations for critical, complex, or risky work items such as reactors, heaters, compressors, etc.
- Prioritize the work scope in order to meet budgetary or schedule mandates
- Approve or disapprove any late work scope additions or changes

4.6 Work Scope Peer Review

Since timely and complete turnaround work scope development is one of the principal goals of the planning phase, it is recommended that periodic Work Scope Peer Reviews be conducted by an independent team of company staff. This will ensure that the turnaround work scope development process is followed and that the defined work scope is consistent with the company's business goals and turnaround objectives. With so many conflicting signals and priorities, sometimes the Turnaround Management Team can lose its focus and come up with inadequate and improper work scope.

The Work Scope Peer Review Team should consist of company representatives and outside experts who are independent of the ongoing turnaround planning effort. Depending upon the size of the turnaround, these reviews should be conducted on a quarterly basis. The final work scope should definitely be reviewed and certified by the team prior to its submission and approval from the Site Leadership Team.

4.7 Management of Work Scope Changes

Any turnaround work scope items that were not originally identified for the Turnaround Work Scope as per the final cut-off date (Design Freeze Date) will be classified as Added Work or Scope Change. This section described the process to control and approve any Added Work or Scope Change during both the planning and the turnaround execution phases. There is clear distinction between these two issues and they are clarified below:

- Added Work is defined as the work request not originally identified by the final cut-off date.
- Scope Change is defined as the work identified due to new work additions or significant growth to the approved work requests.

All the Added Work/Scope Change requests should be documented by using the Variance Process during the Detailed Planning Phase (See attachment) and Field Change Order Form during Execution Phase located on the Mosaic Purchasing Department Intranet.

4.8 Review Checklist

- Work Scope Criteria is reviewed and finalized for each turnaround.
- Work Scope Development is recognized as the key focus of the planning effort.

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- Work Scope Development Cut-off dates are finalized with the input and agreement of responsible groups.
- Work Scope Review Team has been established with representatives from key departments.
- Work Order Packages are developed for all approved work requests.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Design Freeze Variance Process
- Field Change Order Form

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TMPP-C06 CONTRACTING STRATEGY AND PLAN

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Contracting Strategy and Plan

The contracting Strategy and Plan is the essential front-end loading step to select the most qualified contractors and to maximize returns on turnaround contracted dollars. The Contracting Plan is used as a principal tool to communicate the contracting approach to all turnaround staff and involved organizations. The Turnaround Management Team should continually refer to the Contracting Plan to ensure that all contracting activities are consistent and support the approved contracting strategy for the turnaround.

The Turnaround Management Team will develop a Turnaround Contracting Strategy to address the specific requirements of a turnaround. A well thought out strategy up front can pave the way for selecting the qualified contractors. For specifics about company's contracting bid process, please refer to Mosaic Bid and Bid Award Policy # MOS-BID-001 on the Mosaic intranet.

In the development of a Contracting Strategy and Plan, the Turnaround Management Team should keep the following points in considerations:

- Overall turnaround objectives and goals
- Turnaround work scope
- Scope of capital projects
- Current contracting market conditions
- Availability of company resources
- Past contracting experiences

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- Risk and critical work areas
- Contractual obligations to in-house and alliance contractors

4.2 Responsibility and Participants

The primary responsibility to develop a Turnaround Contracting Strategy lies with the Turnaround Management Team. However, all the turnaround contracting activities should be carried out with the full support and input from company groups such as purchasing/ contracting, financial, legal, etc.

In the development of the contracting strategy, the following groups should play an active role:

- Turnaround Management Team
- Purchasing and Contracting
- Capital Project Team
- Maintenance
- EHS Department
- Legal
- Finance

4.3 Contracting Strategy

A Contracting Strategy provides the turnaround participants with a clear direction about company's strategy and plans to procure and manage highly qualified contractors. Contracting strategy consists of:

- Gathering all data and information related to the turnaround which will influence the contracting actions for the turnaround.
- Analyzing such data and information, including potential effects on costs, schedule, quality and safety.
- Structuring potential contracting strategies for the turnaround, including qualifying and quantifying the advantages and disadvantages of each scenario.
- Determining the contracting strategy which will best provide the opportunity to meet the turnaround objectives.

The results of the contracting strategy are documented for the formal review and approval by the Site Leadership Team. The contracting plan should be reviewed from time to time to ensure that contracting efforts conform to the turnaround needs and reflect the current market conditions.

4.4 Contract Breakdown Structure

The Contract Breakdown Structure provides a logical grouping of turnaround components from contractual effectiveness and efficient execution considerations. It is one of the important steps in developing an overall contracting strategy and identifying the number of contractors needed for optimal execution efficiency.

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The initial step in developing the Contract Breakdown Structure is to list all of the work scope to be performed as part of the turnaround. This will include work items which can be broken down into logical work packages, such as exchangers, towers, piping instrumentation upgrade, etc.

The next step will be to put these work scopes in a logical grouping based upon the type of work, physical location, supervision and execution efficiency.

The following are some considerations in developing a Contract Breakdown Structure:

- Turnaround Work Breakdown Structure
- Company's organizational structure and capabilities
- Physical layout of the work area
- Preferred contract type and contractual arrangements
- Logistics considerations
- Work scope development and time frame
- Contractual risks and considerations
- General contractors versus specialized contracting
- Conflict related to resources, area and time
- Role of subcontractors and in-house contractors

4.5 Turnaround Contracting Plan

The strategizing planning and contracting result in a final document called the Turnaround Contracting Plan. This contracting plan guides the subsequent contracting activities including contractor selection and provides the following information:

- Company's turnaround contracting approach
- Number of contractors needed
- Contractual arrangement, e.g. reimbursable, fixed-price, etc.
- Contractor procurement schedule
- Responsibility and interface matrix

The Turnaround Management Team should continually refer to the Contracting Plan in order to ensure that all contracting activities are consistent and support the approved contracting strategy for the turnaround.

4.6 Contract Types and Approaches

The major focus of the Turnaround Management Team and the purchasing department is to develop a contracting approach that is the most beneficial to meet the company's business and turnaround goals. The definition of turnaround work scope is an important factor in determining the preferred contractual arrangements. Normally, the preferred contracting approach and arrangements to be utilized should be established in the Contracting Plan as part of the contracting strategy process.

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The contracting approach or arrangements chosen depends upon the circumstances surrounding a turnaround and Mosaic's contracting guidelines. In all cases, the selected contracting approach should provide the contract type that will provide the company with the most efficient and cost effective method of executing the turnaround.

The duration associated with the various contracting approaches should also be considered as timing may preclude the use of the preferred options even though these could have been more effective.

4.7 Contract Types – Commercial Arrangements

While there are many variations, conceptually there are only two basic types of contracts, namely Fixed-Price or Reimbursable Cost contracts. The advantages and disadvantages to the company and the incentives and risks to the contractor vary widely between these two basic contract types. Therefore, it is important to understand the basic distinctions between these and to select the most appropriate contracting option for each situation.

Some of the options that may be available to the turnaround teams are listed below:

- Fixed-Price or Lump-Sum Cost
- Reimbursable Cost
- Cost Plus and Fixed Fee
- Unit Price
- Evergreen, Blanket or Umbrella
- Partnership and Alliances

4.7.1 Fixed-Price or Lump-Sum Contract

In a fixed-price or lump-sum contract, the contractor agrees to perform a well defined work scope based on agreed upon performance criteria for a specified fixed price. The price is fixed for a defined work scope and is not subject to change based on the contractor's actual costs or expenditures.

Fixed-price contracts are used where few changes in scope are anticipated or when the economic climate fosters competition. In agreeing to perform the work for a fixed price, a contractor typically assumes a higher risk for performing the work within the contractually agreed cost. The key considerations in using the fixed-price contract are:

- Established work scope and performance expectations
- Clearly defined site and work conditions
- Contractor must have proven experience and financials
- Strong turnaround management staff for both owners and contractors
- Good management controls systems

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4.7.2 Reimbursable Cost Contracts

In reimbursable cost contracts, the contractors get reimbursed for the cost associated with all the work performed in support of the turnaround at the agreed upon commercial terms. Reimbursable cost contracts are desirable in situations such as when:

- Turnaround work scope is not fully defined
- Flexibility to make changes to the work scope is necessary
- "Fast track" execution is desirable
- Company wants to influence contractor's execution approach
- Market conditions are such that discourage contractors from taking extra risks

4.7.3 Cost-Plus Fixed-Fee Contracts

This contracting approach falls somewhere between the fixed-fee and reimbursable cost contracts. In this type of contract the contractor's cost related to overhead, management and staff, logistics support, profits and fees are fixed prior to the commencement of work. This cost is competitively bid and forms the key consideration in the commercial selection process. The key characteristics of these types of contracts are:

- Combination of fixed-price and reimbursable approach
- Contractor's overhead, management, staff and profits are fixed
- Company reimburses for direct cost, e.g., labor, major equipment, etc.
- Best opportunity when competitively bid
- Incentives can be offered for exceptional performances

The contractor gets fully reimbursed (per the agreed terms) for direct work hours spent to complete the turnaround tasks. In this type of contractual arrangement, the company shares the risks related to the number of work hours while the contractor shares the risks related to any escalation in overheads.

4.7.4 Unit Price Contracts

The unit price contract is a variation of the lump-sum contracting approach. This type of contract is generally employed when the work scope is definable but the work quantities are uncertain. In the absence of a firm handle on the quantities, the company can negotiate a fixed price per unit to execute the work. The unit price contract is selectively used in turnarounds to manage work such as valve repairs, scaffolds, x-rays, etc.

4.7.5 Evergreen or Blanket Contracts

In order to avoid contracting bottlenecks on frequently needed services for turnaround work, companies frequently utilize the evergreen or blanket contracts. Under this type of agreement, the commercial terms are agreed upon and the work is performed by the contractors upon the company authorization. A good

example of evergreen contracts could be scaffolding, hydro blasting, painting, etc.

4.7.6 Partnership and Alliances

The partnering and alliance approach to contracting is used when the company has a significant workload in the foreseeable future. In this case it makes sense to form a partnering alliance with a contractor to perform the work on mutually advantageous commercial terms. This eliminates the costly and time consuming contractor selection process.

Expected benefits include improved efficiency and cost-effectiveness, increased opportunity for innovation, elimination of learning curves and continuous improvement of quality services.

4.8 Incentive Contracting

Depending upon the turnaround needs to achieve exceptional results; sometimes it is advisable to incorporate the incentive or penalty provisions into a contract. Incentive plans are typically used to encourage contractors to apply their best efforts in order to complete the turnaround at an accelerated pace or to meet any other specific turnaround objective. The incentives could be related to cost, safety, quality, schedule or any relevant performance parameters.

Incentive and penalty contracts, if thoroughly planned and effectively implemented, have historically delivered improved performance. These provisions should create a productive win-win relationship and higher turnaround results.

Increasing performance through incentive contracts requires accurate and precise definitions of work to be performed and, in most cases, requires closer supervision than standard contracts.

4.9 Review Checklist

- Development of a Contracting Strategy and Plan is an essential front-end loading step to select qualified contractors and maximize returns on contracted dollars.
- The Turnaround Manager should ensure participation of key departments in the development of contracting strategy.
- The contracting strategy must reflect the current market conditions and availability of potential contractors.
- Contractor Breakdown Structure should be developed to reflect the number of contractors that will be needed to meet the project needs.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Contractor Breakdown Structure

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TMPP-D01 DETAILED PLANNING

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Detailed Planning

The Turnaround Management Team's principal focus during the Detailed Planning Phase is to address all work scope planning and execution issues specific to a turnaround. In this phase, all participants focus their efforts to overcome risk/critical issues and the turnaround performance goals that were identified during the Strategic Planning and Work Scope Phase.

The Detailed Planning focuses on gathering all information in order to develop effective schedule plans and associated control documents. Some of the issues which are accomplished as part of the Detailed Planning include the following:

- Reconfirmation of turnaround work scope
- Staffing the turnaround organization team
- Contractor evaluation and selection
- Vendor negotiations and selection
- Identification of materials and procurement
- Procurement of construction equipment and tools
- Logistics planning
- Strategies to procure critical/scarce crafts
- Turnaround controls and monitoring system
- Turnaround-Specific EHS Plan

- Coordination with execution groups and contractors
- Pipe pre-fabrication
- Unit Shut-down and start-up plans
- Execution Schedule and critical path
- Final control estimate/budget

To effectively manage the activities of the Turnaround Planning phase, the Turnaround Management Team should develop a Checklist and a Plan to Plan the Turnaround. This will ensure that all the turnaround planning steps are identified and completed on time.

4.2 Work Breakdown Structure

Plant turnarounds typically consist of several units, work areas, different equipments, smaller interrelated tasks and work elements. The Work Breakdown Structure (WBS) concept is designed to divide the overall turnaround work scope into smaller and manageable work elements. The purpose of a WBS is to sub-divide the total turnaround effort into smaller controllable work packages or elements.

The first step in creating a WBS is to organize the turnaround into major work categories. Major categories are divided into sub-categories which, in turn, are further subdivided and so on. This breakdown continues so that the scope and complexity of work elements is reduced to a level that is easy to plan, manage and control.

The objective of this analysis is to reduce the breakdown into work elements that are so clearly defined that they can individually be accurately recognized, budgeted, scheduled and controlled.

A typical WBS might consist of following six levels (in actuality the number of levels may vary; the name of the element description at each level is determined to suit each shutdown):

Level	Element Description
1	Plant
2	Unit
3	Area
4	Discipline
5	Work Package
6	Activities

4.3 Detailed Scoping of Turnaround Work

Once the Turnaround Work Request has been approved by the Turnaround Work Scope Review Team, then the next step is to develop the detailed work scope. The detailed work scope development is a joint effort by several groups associated with the Turnaround Management Team, e.g. production, maintenance, inspection, safety, etc.

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Each of the groups looks at the work scope from their perspectives which should be further blended together to develop a unified execution plan.

4.3.1 Production Department's Input

Production department looks at following considerations that are applicable to effectively plan and execute the approved work order:

- Lockout / tag out sequencing and requirement
- Utility outage scope and scheduled duration
- Equipment availability sequence
- Shutdown system sequence
- Startup sequence and schedule requirements
- Approximate volume of waste, composition, etc.
- Fresh air requirements
- Temporary piping and/or equipment, etc.
- Asbestos/Lead abatement
- Equipment close-up requirements
- Mechanical support during start-up
- Drawings and documentation requirements (QC/QA)

4.3.2 Inspection Department's Input

The Inspection Department along with maintenance should use this checklist to define work scope requirements:

- Equipment history and inspection
- X-ray requirements
- Stress relief requirements
- Special welding requirements
- "Code Work" list
- Statutory/recertification requirements
- Torque requirements
- Contractor welding procedure approval
- Hydro/pneumatic testing requirements, piping, vessels, tubes, etc.

4.3.3 Planning Department's Input

The turnaround planner will detail the work scope by identifying the following planning and execution considerations:

- Detailed work steps

- Time frame for each work step
- Work sequence and logic
- Scaffold requirements
- Size of craft crews
- Manpower and craft requirements
- Material take-off
- Construction equipment requirements
- Tools and consumable requirements

4.4 Work Order Package Contents

To ensure quality and complete execution of an approved work order, the Turnaround Planner is responsible to develop a detailed Work Order Package (may be electronic or hard copy). All the work order planning, testing and execution related information is included in this folder to facilitate efficient field execution.

The information in the folder is reviewed by the planning and the field foremen (both Mosaic and contractors) for completeness before included for field execution.

A typical Work Order Package folder should include the following:

- Approved Turnaround Work Order
- Detailed/sequenced work steps along with responsible group
- Drawings/sketches/pictures
- Material requirements and status location
- Construction equipment/tool requirements
- Scaffold requirements
- Insulation requirements
- Management of Change (MOC) requirements (if applicable)?
- Inspection requirement
- Testing requirements
- Equipment close-up procedures
- Environmental Procedures/Forms

4.5 Responsibilities for Detailed Planning

The primary responsibility for detailed planning lies with the Turnaround Planner. Many other groups that provide input in the work scope planning include the following:

- Production/Operations
- Maintenance
- Capital Project Manager

- EHS Representative
- Inspection/Reliability Representative
- Process/Technical
- Warehousing
- Contractors' Representatives
- Etc.

4.6 Standard Work Order Structure

At the beginning of the turnaround process a master (parent) work order should be initiated. Start the long description with a standard number such as CBR08SA06; CBR for Bartow Plant, 08 for 2008, SA for Sulfuric Acid, 06 for #6 Sulfuric Acid Plant. With this nomenclature, you can easily retrieve any turnaround master work order. Children work orders should be generated under the master for each major piece of equipment.

These children work orders can be drilled down as far as needed and "grandchildren" work orders can be established for "task" levels. Develop standard job plans in Maximo and attach them to your work orders as needed. Develop Parts list for each job plan as well. Using this structure, cost can be "rolled up" by work order level all the way to the master.

4.7 Standardizing Work Scope Packages for Future Use

Many turnaround jobs are repetitive from one turnaround to another and detailed work scope packages for those jobs can be re-used many times over. All routine work and repetitive work should be standardized where possible for future use. The work completion process should be utilized to enhance the job packages and lessons learned captured.

These detailed work scope packages are necessary for proper planning and for use in bid preparation when needed. They should include all the required job steps, equipment and tools needed, bill of materials and support services such as scaffolding, insulation, etc.

4.8 Review Checklist

- Major effort during this Detailed Planning phase is to reconfirm turnaround work scope and gather accurate planning information for schedule development and ensure efficient execution.
- Operations should provide shut-down and start-up sequence and activities that need to synchronize with mechanical work.

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- The Detailed Planning Phase results in the development of several control documents including schedules, manpower plans, progress reports and other performance tracking documents.
- The Turnaround Manager should ensure adequate resources are assigned to the team to develop all the required deliverables from the phase.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-D02 SCHEDULING

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Scheduling

All the information developed during the turnaround planning phase leads to the development of turnaround schedules and controls documents. The validity of turnaround schedules will be a direct reflection of the quality of planning information. As such, the major focus of the Turnaround Management Team should be to ensure that the planning information is accurate, timely and reflective of actual work conditions.

The Turnaround Planner spearheads the scheduling effort to logically plan all the integrated turnaround activities in the most safe and time-effective schedule plans. The quality of schedules is important, as the final schedules lead to the development of several execution performance tracking and decision making documents/tools, e.g.

- Turnaround Critical Path
- Near/Potential Critical Path
- Major Schedule Milestone
- Leveled and Optimized Resource Plans
- Field Craft Requirements
- Construction Equipment
- Critical Resources, e.g., welders, etc.
- Owner's Resource Plans
- Operators

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- Safety inspectors
- Inspectors
- Foremen/Supervisors
- Material Requirement Dates
- Decision about shift hours/overtime, etc.
- Progress Reports and Controls
- Productivity Curves
- Cost Expenditure and Commitment Curves
- Fine-tune the Organization Chart and resource requirements
- Look ahead schedule for next 1-2 shifts
- Impact of Changes/Add-ons
- Daily schedule update meeting
- Interfaces and potential conflicts
- Historical Performance Data

Since the effectiveness of all above documents depends upon the quality of turnaround schedules, the Turnaround Management Team should ensure that accurate planning information is developed and verified before its use in the turnaround schedule development.

4.2 Standard Schedule Modules for Major Equipment

Most turnaround jobs are repetitive from one turnaround to another and detailed work scope packages for those jobs can be re-used many times over. These detailed work scope packages are necessary for proper planning and for use in bid preparation when needed. They should include all the required job steps, equipment and tools needed, bill of materials and support services such as scaffolding, insulation, etc. See Section C “Strategic Planning and Work Scope Phase” for additional information.

As in the planning phase with standard planning modules for routine work, standard schedule modules exist for major equipment that has routine work being performed. These modules are “tried and true” and should be plugged in where applicable to the overall schedule. Many times these modules only require minor adjustments.

4.3 Critical Path and Turnaround Durations

The turnaround critical path, once identified, should drive the turnaround duration. Care must be taken to identify “near” critical path jobs as well and prepare countermeasures for changes in critical path and "near" critical jobs. All the other jobs on the schedule should be secondary in priority to the critical path job.

4.4 Major Turnaround Milestones

The turnaround schedule should identify major turnaround milestones for measurement progress against the approved plan. These milestones are designed for decision making

and ensure sufficient schedule progress is being made in order to meet overall completion date.

4.5 Integration of "Shutdown and Start-up" Schedules

In addition to the mechanical portion of the turnaround work, the turnaround schedules should also include all activities related to the unit shut-down and start-up.

The production department is responsible to develop detailed procedures and logical schedule of plant shut-down and start-up by each process system. The turnaround planning team should work closely with the production department to translate the shut-down and start-up procedures into Gantt Chart to identify the following information:

- Sequence of shut-down by each process system
- Duration of shut-down, cool down and purge process
- Availability sequence and time frame of equipment/facilities for mechanical work
- Mechanical support resource requirements during shut-down and start-up.
- Priority sequence and timing for the mechanical completion of various equipment to support the efficient start-up
- Start-up priorities for each process system

4.6 Scope Additions and Impact Assessment

The turnaround planning success is dependent on the work scope being finalized early enough to allow the planner's time to plan. Therefore, a date has to be set far enough out from the execution phase to allow planning. That date is the "Design Freeze Date". The "Design Freeze Date" should be reviewed and finalized and a review variance process for planning phases approved and in place. See example in Section C05.

4.7 Look Ahead Schedules

The field execution crew supervision and planners need to have a working schedule available to them for 2 to 4 shifts forward. Manpower, equipment and materials management will be based upon these schedules. The daily schedule update will be generated using these look ahead schedules as well.

4.8 Daily Update of Turnaround Schedules and Schedule Forecasting

The schedule must be accurately updated daily to ensure the turnaround remains on plan. These updates will tell the turnaround team where they are and when adjustments will need to be made. These updates will enable the generation of look ahead schedules, progress reports, schedule forecasting and overall performance evaluations.

4.9 Optimizing and "Buy-in" of Turnaround Schedules

The optimizing of the turnaround schedule will lead to the most efficient turnaround execution and utilization "leveling" of available resources. The "buy in" of the schedule will provide the confidence to stick to the original schedule as much as possible. Variance from the schedule can lead to miss-used resources, confusion, inefficiency, etc.

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4.10 Review Checklist

- Detailed turnaround schedules are developed with the participation of the staff representing key company departments and contractors.
- The turnaround schedules should incorporate operation's shut-down and start-up schedules and priorities.
- Look-ahead Schedules and Daily Work List should be thoroughly reviewed for accuracy and completeness before release to the field supervision.
- Both Mosaic and contractors share responsibility in the daily schedule update and analysis.
- Any work scope changes and add-ons should be evaluated to assess their impact on the turnaround schedule and completion date.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-D03 CONTRACTOR SELECTION

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team (as described in section H of this manual) - are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Contractor Selection

The success of a turnaround to a great extent depends upon the ability of Mosaic to select the most qualified contractors. To select the best and most suitable contractors, the Turnaround Management Team should follow a systematic Contractor Selection Process which also meets company's procurement policies and guidelines. This will ensure that the Contractor Selection Process and the selection criteria are consistent and focused, and meet company's business goals and turnaround objectives.

4.2 Contractor Selection Process

In selecting various contractors and subcontractors, the Turnaround Management Team must follow a Contractor Selection Process which is turnaround-specific and at the same time meets company's procurement and contracting policies.

To procure the services of turnaround contractors, a Contractor Selection Process Flow Chart should be developed (see example attached). This flow chart will identify the procurement steps along with major decision milestones. This flow chart should be modified to reflect a specific Contractor selection requirement and the planned contractual arrangements.

4.3 Mosaic's Procurement Policies and Procedures

In selecting the most qualified and suitable contractors for a turnaround, the Turnaround Management Team must keep in consideration and follow Mosaic's Procurement Policies and Procedures. For more specific details the Turnaround Management Team should

refer to Mosaic's Procurement Policy Document #MOS-BID-001. Key elements of this policy document are outlined below.

4.3.1 Purpose

The purpose of this policy is to provide the Mosaic facilities and staff with bidding process requirements for the procurement of required materials and services. The intent of the policy and procedure is to ensure that products and services are purchased at the best value, demonstrate that evaluations of bids are fair and impartial, ensure that our bidding process has proper controls which include segregation of duties, and hold Mosaic representatives accountable for maintaining high ethical standards in the Bidding Process.

4.3.2 Policy

The appropriate Project Manager, Purchasing Manager, Senior Buyer, Buyer or Sourcing Manager will review requirements of a job and develop the bid package and scope of work. Bids will be tracked by the location Purchasing Manager, Site Buyer, or Sourcing Manager utilizing a manual log or by tracking bids on a log by work order number or Project name/number. All bids will be solicited through the use of a formal RFQ (Request for Quotation), RFP (Request for Proposal), or RFB (Request for Bid). As a general rule of the policy, Procurement may choose to bid any packages as deemed necessary. Exceptions to the policy must be approved by the BU Procurement Manager, BU VP Operations, and/or a Senior Leadership Team (SLT) member.

4.3.3 Responsibility

A Mosaic Project Manager, Purchasing Manager, Senior Buyer, Buyer, and Procurement Manager are responsible for the implementation of this procedure. It is the responsibility of the Purchasing Manager, Senior Buyer, Buyer and Sourcing Manager to follow and enforce these guidelines and ensure their compliance.

4.3.4 Discretionary and Required Bidding

The company's Procurement Policy clearly outlines the monetary threshold and other project specifics that should be met in deciding competitive bidding vs. sole source selection of a contractor.

The Project Manager may also elect not to bid the job but will select the supplier for the job in a fair and impartial manner utilizing the bid waiver process posted on the purchasing department intranet site. If a purchase is bid; the bid package, specifications, documentation and scope should be forwarded to the location's Purchasing Manager, Senior Buyer or Buyer before sending the documentation to the suppliers. If the project manager wishes to bid the project, a list of suppliers bidding on the job should be supplied to the location's Purchasing Manager, Senior Buyer or Buyer along with previously mentioned documentation. All spend threshold values are in local currency.

4.4 Contractor Selection Steps

The Turnaround Management Team and the Purchasing Department, with the help of concerned departments, play a lead role in developing the Contracting Strategy and Plan. Once the Contracting Plan is established, then the real work starts for putting together a detailed step-by-step plan for the selection of qualified contractors.

Depending upon the size and magnitude of contractor work scope, the following key steps are required if the contractors are selected through competitive bidding process:

- Contracting Strategy & Plan
- Contractor Pre-qualifications
- Selection of Bidders
- Bid Package Preparation
- Contractor Proposal
- Bid Review
- Bid Clarification
- Legal and Insurance Reviews
- Negotiations
- Contract Award

To ensure timely selection of the Contractors all the above steps should be planned in a time-scaled logic diagram. In addition, proper responsibilities should be assigned to comply with the work scope requirements. Depending upon the number of contractors or subcontractors to be selected, contractor selection effort can be significant and it is necessary that adequate and qualified teams/staff are assigned.

4.5 Selection Criteria

The Turnaround Management Team, in consultation with the Purchasing Department, should develop and follow contractor qualification and selection criteria. This selection criteria identifies the basis for qualifying and assigning comparative ratings to different contractors as part of the selection process.

The qualification/selection criteria can be broken down in these two (2) broader categories:

- Mandatory Requirements

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- Objective Assessment

4.5.1 Mandatory Requirements

To qualify for any turnaround work, the contractor must meet the following mandatory requirements as established by Mosaic's site management. Examples for Mandatory Requirements are:

- Safety qualifications and requirements
- Dunn and Bradstreet credit
- Financial stability
- Insurance coverage
- Past experience

If a contractor does not meet even a single requirement as outlined above, then they are disqualified and eliminated from the bidding process.

4.5.2 Objective Assessment

The Objective Assessment includes the qualification selection criteria that can be measured and substantiated by the contractor's past performance and existing capabilities. Some of the objective assessment issues include:

- Experience of proposed turnaround staff
- Turnaround expertise and knowledge
- Experience with Mosaic and similar turnarounds
- Work load during the planned turnaround time frame
- Planning and cost control capabilities
- Competitive price and value
- Experience in managing subcontractors, e.g. scaffolding, insulation, etc.
- Resource availability
- The craft procurement from the local pool or from the outside area
- Prior experience with proposed contractual arrangement

4.5.3 Final Selection

Based on the above selection criteria evaluations, the contractors should be selected to perform the turnaround work scope. By involving individuals from key departments, subjectivity is kept to a minimum and contractor's past performance and current capabilities become the principal qualification basis.

4.6 Contractor Selection Responsibilities

To select contractors and subcontractors, the Turnaround Management Team must work closely with the procurement department. This will ensure compliance to company policies and also in expediting necessary contractual process and documentations.

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While the Turnaround Management Team may be more familiar with the turnaround work scope and execution requirements, the procurement department is more knowledgeable in contractual arrangements and procurement process requirements.

The selection of high performance contractors requires assignment of qualified contractor selection teams with a combination of technical and business skills. The responsibility for such contracting activities should be carried out by the turnaround staff but with the full support and input from financial, tax, legal, risk management and other specialist groups.

It is necessary to utilize the services of specialists on the contractor selection teams so that desired performance goals are not compromised in lieu of attractive contract prices.

4.7 Review Checklist

- The Turnaround Management Team should fully understand and comply with company's purchasing and contracting procedures and guidelines.
- In the selection of the turnaround contractors, the Turnaround Management Team should follow the Contractor Selection Process.
- The Purchasing and Contracting Department should actively participate and support the turnaround's purchasing and contracting needs.
- In the selection of contractor, major consideration should be the quality, experience and the ability of the contractors to efficiently execute the work and not just the bid price.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Contractor Selection Process Flow Diagram

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TMPP-D04 MATERIALS MANAGEMENT

MATERIALS MANAGEMENT

IN DEVELOPMENT

PHASE 2

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TMPP-D05 CONSTRUCTION EQUIPMENT AND TOOLS

CONSTRUCTION EQUIPMENT AND TOOLS

IN DEVELOPMENT

PHASE 2

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TMPP-D06 CONTRACTOR'S MANPOWER PLANNING

CONTRACTOR'S MANPOWER PLANNING

IN DEVELOPMENT

PHASE 2

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TMPP-D07 CAPITAL PROJECTS INTEGRATION

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Capital Projects Integration

Capital project execution and tie-ins during the turnaround are becoming an integral part of almost all plant turnarounds. The Turnaround Management Team must work closely with the Capital Projects and Engineering Groups during the Business Planning Phase to fully recognize the magnitude of capital projects and their integration needs during turnaround planning and execution.

It would not be unusual to see where capital project work scope is significantly larger than the normal turnaround work scope. In many cases the turnaround duration would be dictated by the capital project work scope that needs to be completed during the turnaround window.

In either scenario, there is imperative need for the Turnaround Management Team to start working with the Capital Project groups from the earliest turnaround planning phases and, in case of major projects, even earlier. This coordinated planning and execution will ensure that resources are optimized and field execution is efficient without conflicts or and/or area congestions.

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4.2 Integrated Execution Strategy

To ensure success on capital projects which are tied to the turnaround window, it is essential that planning coordination start at the time of project inception. Project work scope and execution strategy play a key role as to what level of integration is desirable for optimized results.

Some of the issues which are key to ensuring seamless integration of capital projects with turnaround plans include the following:

- Number and size of capital projects
- Contracting strategy for capital projects – fixed price, EPC (engineering, procurement, construction), turn-key, etc.
- Capital project work vicinity to other turnaround work
- Criticality and schedule sensitivity of capital work
- Magnitude of work scope during the turnaround window
- Capital project funding approval time frame as compared to turnaround schedule

4.3 Integrated Organization Structure

For some capital projects which are of significant magnitude and are stand alone, it may be desirable that these projects should be managed separately and not be integrated into the turnaround execution plans except for the tie-ins.

Both the Turnaround Management Team and the Capital Project Manager/Engineer play integral but distinctive roles in ensuring the success of capital projects. In spite of the need for execution planning integration, responsibilities for engineering, procurement of materials for capital project always remain with the Capital Project Manager.

Capital project work which must be performed during the turnaround window can be optimized if it is planned and managed under the leadership of the Turnaround Management Team. However, in case the capital project work scope is significantly larger than the turnaround, then these roles could reverse or put under a Senior Manager who would oversee both the capital projects and turnaround. In that case the Project Manager and the Turnaround Manager will report to the Senior Manager.

Continuous communication and coordination between the capital projects and turnaround groups is essential to achieve goals for integration, optimize resources and avoid execution conflicts. Both the Project Manager and Turnaround Manager should regularly attend project and turnaround meetings and be represented in their organization structures.

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4.4 Optimum Contracting Considerations

One of the key benefits of the earlier integration between capital projects and turnarounds is to avoid any potential construction conflicts where each group is competing for same pool of contractors and support services. This can be counter productive to company goals and leave both sides understaffed and potentially give contractors the undue advantage.

It is imperative that both the capital project and turnaround groups jointly develop their contracting strategy for construction contractors and support services. A joint Contracting Strategy and Plan should be developed at least 6-9 months before the turnaround in order to select qualified contractors 4-6 months before the turnaround. In developing the joint contracting strategy, following participants should be consulted and provide their input:

- Capital Project Manager
- Turnaround Manager
- Purchasing and Contracting Representative
- Maintenance Department Representative
- Production Department Representative
- Environmental Health and Safety Representative

4.5 Integrated Turnaround Plans

The planning groups from both the capital projects and turnarounds should work together to develop common integrated plans for the Execution Phase of the turnaround. This plan should include all the project work scope and tie-ins that need to be performed during the turnaround execution window.

Integrated planning will help to achieve following key objectives:

- Perform all execution under same Mosaic leader.
- Optimize utilization of field resource *e.g.* crafts, construction equipment, support services.
- Minimize area and other execution conflicts
- Provide flexibility to move field staff to meet changing priorities.
- Reduce indirect and overhead costs and optimize use of company's field supervision.

4.6 Cost Management and Allocation

Even though construction work is executed by using integrated turnaround plans and utilization of same pool of resources, funding for capital projects and turnarounds comes from different company sources and must be tracked, allocated and eventually reported separately.

Early understanding between the project and turnaround teams about the mechanism to collect and allocate cost is essential to avoid conflicts after the turnaround completion.

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Both the teams should agree about the mechanism for fair cost allocation of support services.

Contractors should be required to charge costs to segregated field work orders for capital projects and turnarounds. Similarly any work scope changes and growth should be tracked using the Field Change Management process, and costs should be charged to respective capital projects or turnarounds.

4.7 Review Checklist

- Capital projects and turnaround teams should start working closely from the earliest project and turnaround planning phases.
- Depending upon the size of capital projects and turnarounds, a leader for the execution phase should be designated and assigned.
- Key focus of integration is to optimize resources and avoid execution conflicts.
- Cost tracking and allocation mechanisms should be decided before the turnaround start date.
- All work scope changes should be tracked and their costs should be allocated to the right projects and/or turnaround.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-D08 PRODUCTION PLANNING

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Production Planning

Since the Production Department is closely associated with operating the facilities, they have first hand knowledge of mechanical and/or operating deficiencies, and necessary repairs that should be performed during the turnaround. Thus, the Production Department's early involvement and participation in the planning process is a key to turnaround success.

The Turnaround Management Team should identify key individuals from the Production Department who should be involved in the turnaround to lead production planning activities. This will not only ensure successful turnaround, but will also lead to a safer and productive work environment.

4.2 Production's Leadership Role

The Production Department has to take a role in the planning of the turnaround and ensure that turnaround goals for a safe, successful, productive, and well executed turnaround are met.

The production department's role is lot more extensive than just developing shutdown and start-up procedures, and assisting in work scope development. A thorough understanding of production departments' role shows following activities that they should be performed to facilitate effective planning, efficient execution and long-term operational reliability.

- Identify complete turnaround work scope
- Develop facility shutdown and startup procedures and plans

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- Emphasize turnaround safety concerns and ensure compliance to safety and environmental regulations and policies
- Implement Management of Change (MOC) process and training
- Translate procedures into logically timed schedule plans
- Breakdown by operating systems and identify associated equipment and work scope
- Prioritize systems based on critical path of mechanical work scope
- Integration with decontamination, de-inventory and clearing plans
- Identify operational needs such as steam, waste disposal, etc.
- Operators' requirements by each shift
- Guide in the development of an efficient safety/work permit system

4.3 Shutdown and Start-up Plans

The Production Department, in close coordination with the Turnaround Management Team is responsible for the development of the facility's shutdown and startup procedures and plans. These plans are an essential requirement to ensure safe and efficient execution of plant turnarounds.

The existing shutdown and start-up procedures need to be reviewed and evaluated for current and changing operating conditions. Consideration needs to be given to the critical path jobs when prioritizing system isolation and cleanup procedures

The Operation's shutdown and startup plans should meet the following requirements.

- Break down the turnaround work scope by operating systems.
- Establish a logical sequence from shutdown to startup for each operating system.
- Establish sequence and estimated time frame of availability of equipment for mechanical work.
- Define decontamination, chemical cleaning and clearing requirements
- Identify special safety and environmental risk considerations
- Establish blinding requirements
- Incorporate tag-out / lock-out procedures
- Ensure compliance with company and regulatory safety and environmental requirements
- Identify waste management procedures and logistics
- Plan catalyst handling and disposal
- Identify system startup and checking procedures
- Modify operational procedures and train operators for all newly installed or modified equipment, piping, etc., to meet MOC requirements

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- Effectively implement PSSR procedures and guidelines

4.4 Pre-Startup Safety Review (PSSR)

Mosaic's Production Department is responsible to establish Pre-Startup Safety Review (PSSR) procedures and incorporate these into the turnaround plans and procedures. PSSR should be conducted for all new, modified or changed facilities as per the company's Management of Change (MOC) procedures and Process Safety Management (PSM) guidelines.

A PSSR Team should be assigned to implant PSSR programs for all new or modified facilities. The size and expertise of the PSSR Team should be appropriate to the magnitude of turnaround work scope changes or modifications. The PSSR Team members should satisfy themselves that the general elements of Process Safety Management are in place for any changes or modifications.

As part of the work scope review, each work order should be looked at from the PSSR and MOC implementation perspective. PSSR requirements should be clearly identified and communicated to the proper parties.

4.4.1 Management of Change (MOC) Training

Management of change process review and training needs to be evaluated in the detailed planning phase to identify any issues that need to be addressed in a timely manor. Each job and activity should be reviewed and MOC issues resolved during this phase and timely MOC Training is impacted.

4.5 Purge and Equipment Cleanup

Purging and equipment cleanup are integral and critical components of the plant's shutdown plans. Depending upon the facility's health and hygiene requirements, cleanup can be a very demanding and complex task. The mechanical work for most of the process systems or equipment cannot commence until proper cleaning and purging has been accomplished.

Depending upon the facility, companies may use steam or chemical cleaning as their preferred method. Most of the purging is performed utilizing the process systems approach. In the development of production shutdown and purging plans, mechanical critical path should also be taken into consideration. Whenever possible, production should give high priority to the purging of those process systems or equipment which are on the turnaround critical path.

Effective purge planning is essential in order to establish realistic logistics and time frames. Purging and cleaning schedules also establish the equipment release sequence and time frame for mechanical work. If proper equipment release sequence is not maintained, it could have a negative impact on the momentum of mechanical work execution.

4.6 Production Resources

As part of the turnaround planning, the Production Department should identify the resources required to efficiently manage the production group's planning and execution activities. Sufficient productions' resources should be assigned to the turnaround team in order to develop shutdown and start-up procedures and plans. Production Department's leadership roles should be reorganized and emphasized during the Strategic Planning

and Work Scope Phase. An Organization Chart for the Production Department should clearly identify the roles and responsibilities of these resources and this information should be communicated to the Turnaround Management Team.

It is imperative that optimum production resources should be provided and they be readily available to meet the turnaround planning requirements. The production resources can be broken down into two key categories, namely:

- Organizational
- Materials and Supplies

Based upon the production procedures and plans, the following resources should be identified in consultation with related departments:

1. Operators
2. Operators for issuance of safety/work permits

Optimizing the utilization of production resources with the turnaround plans can offer significant cost savings to the company. Under the Materials and Supplies category, production should identify the needs for items such as:

- Steam
- Catalyst
- Waste disposal trucks, etc.
- Nitrogen

Many of these supplies or services are provided by outside vendors. For cost effective procurement, it is important that these service requirements be synchronized with turnaround execution schedules. The key focus is to optimize the utilization of all resources in order to efficiently and cost effectively execute the turnarounds.

4.7 Review Checklist

- Assign senior Production Leader from the earliest turnaround planning phase.
- Production must play a role in developing, finalizing and managing work scope.
- Shutdown and start-up plans should be developed in detailed and incorporated in the turnaround schedule.
- Production should spearhead the MOC training and PSSR implementation.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-D09 LOGISTICS PLANNING

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Logistics Planning

For each turnaround, the Turnaround Management Team should develop a detailed Logistics Plan identifying key location of turnaround facilities, construction equipment and support services. The Logistics Plan helps to efficiently execute field activities and forewarns of potential area conflicts.

In the development of the Logistics Plan, the Turnaround Management Team should keep the following issues in consideration:

- Develop the logistics plan during the planning phases of the turnaround with the input of all participants including contractors.
- Ensure compliance to company's existing guidelines for temporary facilities and safety requirements.
- Compliance to regulatory requirements *e.g.* blast proof buildings and locations.
- Review with capital projects to identify any potential area or logistical conflicts.

- Ensure Productions' direct involvement during the logistics plan development.
- Consider field productivity as a key goal by avoiding unnecessary travel time.

4.2 Turnaround Logistics Plan

The turnaround logistics plans should be developed for each turnaround irrespective of its size and magnitude of the work scope. In the development of Logistics Plan, the Turnaround Management Team should get input from key company departments and contractors to ensure completeness and to avoid any area conflicts.

The Logistics Plan should be drawn on a current area plot plan and equipment location plan. Some of the things identified on a Logistics Plan include, but are not limited to the following:

- Temporary Buildings
- Material lay down areas
- Temporary field warehouses
- Parking areas
- Access roads
- Craft facilities, e.g., lunch and change areas
- Tool trailer locations
- Safety offices
- Rigging plans and location of equipments *e.g.* cranes
- Location of compressors, welding machines
- Fabrication facilities
- First aid facilities

4.3 Logistics Planning Responsibility

To ensure efficient field execution, the responsibility of the logistics planning is assigned to a Logistics Team for every company turnaround. The Logistics Team is assigned to the earliest turnaround planning phases and plays an active role through the post turnaround phase.

A Logistic Planning Framework is attached to describe major logistics planning and execution activities that are performed through all the Turnaround Phases. It also shows a responsibility matrix about the role of key departments *e.g.*

- Planning
- Services
- Purchasing
- Warehouse/Stores

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- Environment, Health and Safety
- Material Balance

4.3.1 Logistics Team

The Logistics Team meets regularly to address all logistics concerns and to ensure safe and efficient field execution. For a typical Mosaic turnaround, the Logistics Team consists of the following staff:

- Turnaround Manager
- Maintenance Coordinator
- Production Coordinator
- Warehousing Supervisor
- Procurement and Contracting Coordinator
- Materials Balance
- Environmental Health and Safety Representative
- Capital Project Engineers

4.4 Field Logistics Checklist

The Turnaround Management Team should utilize the attached Logistics Checklist to ensure that all essential preparations have been made for an efficient and safe turnaround execution. The attached checklist covers the following major turnaround logistics consideration:

- Environmental, Health and Safety
- Security
- Office Support Facilities
- Contractor Craft Facilities
- Turnaround Execution Support
- Material Logistics
- Construction Equipment/Tools
- Parking and Transportation

The Turnaround Management Team constantly reviews the Logistics Checklist to ensure all pertinent issues are identified, responsibilities assigned and completed as planned.

4.5 Review Checklist

- Logistics Planning is an important deliverable of the Detailed Planning Phase in order to ensure safe and efficient field execution.
- The Logistics Team should be assigned to address all the logistics needs and considerations of a turnaround.

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- The turnaround logistics must keep in consideration the current industry and company's safety policies and guidelines.
- The Logistics Plan should be communicated and shared with the Execution Teams and contractors.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Logistics Team Guide
- Logistics Sub Team RACI Chart

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TMPP-E01 MOBILIZATION AND LOGISTICS IMPLEMENTATION

1.0 PURPOSE

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2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Mobilization and Logistics Implementation

Pre-Turnaround phase work focuses on mobilization of contractors and company's field resources and implementation of the Logistics Plan to set the stage for efficient turnaround execution. Depending upon the size of the turnaround, mobilization of field resources and associated activities should normally start at least 4-8 weeks before the turnaround start date.

Safety should be emphasized during the mobilization, since the plant is still operating and many people may be relatively new to the facilities. Depending upon the location of work, work permits may be required to perform pre-turnaround activities.

4.2 Contractors' Mobilization Plans

Prior to mobilization each contractor should identify and get approval from the Turnaround Management Team for their specific mobilization plans including location of their trailers. The timing of contractor mobilization is also an important consideration in order to ensure that their staff and field crafts should spend the right time for orientation and familiarizing with the work scope.

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Mosaic's field supervision should carefully plan the contractors' mobilization, so that the process is efficient and all the logistics are in place to get a productive start on field construction.

Field location of contractors' trailers, construction equipment, warehousing, etc should be identified on the overall area plot plan and that should not interfere with other contractors and/or planned activities in the area. Similarly, mobilization of construction equipment, tools and materials should be planned so that field crafts are ready to perform as per the plans.

4.3 Materials Storage at Field Warehouses and Staging Areas

The storage of materials in the field should be coordinated through the Turnaround Planner and the Logistics Coordinator. The designated lay-down area for turnaround parts and materials should be clearly identified in the Logistics Plan and approved by the Turnaround Management Team.

Kitting and staging of warehouse issues and turnaround supplies should be coordinated and communicated through the Warehouse Team.

4.4 Security, Parking, and Transportation Arrangements

The Logistics Team with the support of the Security Department should develop the overall Security Plan for the turnaround. This plan should clearly identify the:

- Designated parking areas
- Transportation arrangements for contractors' craft
- Security badges
- Entrance gates
- Driving permits, etc.

The Turnaround Manager ensures that all these security, parking and transportation arrangements are communicated to all turnaround participants and they comply with these.

4.5 Review Checklist

- A well planned resource mobilization and effective implementation of the Logistics Plan is critical to turnaround success.
- Depending upon the size and complexity of the turnaround, mobilization and logistics implementation should commence 4-6 weeks before the turnaround.

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- The Turnaround Management Team should develop and follow a Logistics Checklist to ensure all associated activities are completed in a timely fashion.
- The Turnaround Management Team should work closely with the contractors to ensure that activities associated with the logistics implementation are carried out efficiently and cost-effectively.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-E02 PREPARTION FOR EXECUTION PHASE

PREPARATION FOR EXECUTION PHASE

IN DEVELOPMENT

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TMPP-03 PRE TURNAROUND MANAGEMENT CONSIDERATION

PRE-TURNAROUND MANAGEMENT CONSIDERATION

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TMPP-F01 FIELD EXECUTION

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Field Execution

During this Execution Phase, the principal focus is to safely shutdown the facilities and start completing the turnaround work scope by following the turnaround execution schedule. Production will ensure that all the facilities are shutdown as per the plans, blinds are installed, and equipment is cleared and prepared for inspection. The equipment is then released for repairs as per the Production's shutdown schedule plans.

All the company and turnaround staff including contractors must ensure that there is top attention to keep safety and environment a key priority. A daily turnaround execution meeting needs to be held with all major turnaround participants attending (including all major contractor representatives). This meeting is held to discuss safety, performance issues, conflict resolution (if needed), support requirements, logistics issues, schedule compliance, etc. (See attached daily meeting standing agenda).

The Execution Phase is complete when the repaired facilities are turned over to Production after the necessary completion checks including PSSR (Pre-Startup Safety Review) compliance. Production leads the commissioning and start-up activities in order to get the facilities operating again and producing on-specification product.

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4.2 Major Focus on Field Safety

The first priority of the execution phase is the safety of everyone involved in the turnaround. On the first day of execution, a plant-wide safety meeting should be conducted with everyone involved attending. Also, each work group should conduct "Tool Box" safety meetings at the beginning of each shift. Regular safety observations and audits should be conducted each shift and turned in to the safety department for evaluation and communication to all work groups. See attachment requirements and examples.

4.3 Release of Facilities by Systems

Each area system (i.e. steam, dry side, wet side, etc.) should be isolated, locked out/ tagged out, and released to work groups per the schedule. When released, the work groups should be notified that the system is ready for permitting and testing for work commencement.

4.4 Managing Critical/ Near Critical Activities

The Turnaround Management Team should be focused on the critical path and near critical path job activities and pro-actively addressing any issues that arise. Changes to the scheduled activities should be communicated immediately to the Turnaround Management Team and the planner for countermeasures and schedule review.

4.5 Management and Execution of Work Scope Changes

All turnaround participants should be trained on the Mosaic Field Change Order Process prior to the turnaround execution phase (see Section C05 Work Scope Development of this manual for details). The need for any work scope changes should be communicated as soon as possible to the Turnaround Manager and approved changes incorporated into the integrated plan and schedule.

4.6 Effective Shift Transfer

Each shift transfer should result in a safe, smooth, efficient and well-communicated transfer of work teams, turnaround management and activities. Each shift supervisor/ superintendent should have all the necessary documentation of performance and activities for their shift and "look ahead" schedule input for the next shift. Any changes in the schedule, equipment status, safety concerns, etc. should be highlights for the incoming shift to evaluate and communicate to all work parties.

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4.7 Coordination between Contractors

Turnarounds involve many Mosaic personnel and contractor personnel working in close proximity to each other. The effective communication and coordination between each is critical to the success of the turnaround and the safety of all the participants. The integrated turnaround schedule and the Logistics Team plot plans should be used to help identify potential coordination issues during the planning phase, but the execution phase often has coordination issues that need to be discussed and resolved. The Turnaround Manager will need to ensure that these issues are resolved in a timely manner and those changes to the plans are communicated to the Turnaround Planner to be captured.

4.8 Completion of Work Activities by Systems

When ever possible, systems should be isolated independently so that when turnaround activities are completed on that system it can be returned to service.

The LOTO process should be organized to facilitate system separation for ease of return to service as well.

4.9 Optimize Support for Night and Week-end shifts

Consideration should be given to effectively optimizing support for nights and weekends to ensure productivity remains high. Often opportunities arise on off shifts for invasive activities to be scheduled (i.e. sand blasting, painting, x-raying welds, etc). These activities are usually very important to the overall schedule and can be critical if a window of opportunity is missed.

4.10 Review Checklist

- Safety should always remain the key focus and priority of Field Execution Phase.
- The Turnaround Management Team and contractors should jointly develop work plans that ensure safe and efficient field execution.
- All completed facilities should comply with the PSSR process prior to their transfer to operations.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Daily Turnaround Meetings Report
- Daily Safety Summary Report
- Scaffolding Modifications Need List

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TMPP-F02 FIELD EFFICIENCY CONSIDERATIONS

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Field Efficiency Considerations

For a typical Mosaic turnaround, the field labor can constitute up to 50% of the turnaround cost. As such, improving labor productivity on a turnaround is one of the biggest opportunities available to enhance a turnaround's cost and schedule results. To achieve higher productivity and efficient field execution, the Turnaround Management Team will need to strategize early and work closely with contractors to develop a comprehensive Productivity Improvement Plan.

4.2 Field Decision Making

During Turnaround Execution Phase, to keep up the turnaround pace, it is important to recognize that quick and timely field decision making is critical to the turnaround efficiency. The Turnaround Manager in consultation with the Turnaround Management Team should identify qualified personnel who are authorized to make field decisions to keep the field momentum going. Also, authority levels for vessel entries, field change order approval, etc. should be well defined and communicated to turnaround participants.

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4.2.1 Resolution of Area Conflicts

The Turnaround Manager is responsible for resolving any area conflicts during the execution phase. Any construction conflicts and roadblocks should be addressed quickly and efficiently, and resolved at a working level without the need to engage senior management.

4.3 Safety Permit Issuance

Timely issuance of safety/work permits, confined space entry permits, etc is critical to the safe and efficient working of field crafts. To minimize any permit issuance delays and mistakes, dedicated work/safety permit preparers that are well trained and understand the procedures should be assigned to the turnaround team.

4.4 Field Procurement and Expediting

Although good planning and scheduling will minimize procurement and expediting during the execution phase, some procurement needs will occur with the newfound work and unforeseen events of the execution phase. The Turnaround Manager and Planner would have to make sure that the warehousing and procurement groups are informed in a timely manner of procurement requirements as they arise and set priorities for procurement, and ensue timely delivery for needed parts, materials and services.

4.5 Constructability Analysis

Constructability is the process of doing everything possible to make construction easy in order to improve quality, safety, productivity, and to shorten construction schedules. Maximum turnaround benefits can be achieved when individuals with constructability experience become involved during the turnaround planning phase. Some of the things which are emphasized during constructability studies include:

- Standardization of work
- Pre-fabrication preferably in a shop environment
- Easy accessibility to work areas
- Construction technologies which facilitate efficiency
- Optimize work sequence
- Use of similar equipment
- Elimination of redundant steps

4.6 Productivity Improvement Program

To achieve highest turnaround results, the Productivity Improvement Plan and its implementation should be initiated at least 3-5 months prior to the turnaround start date. The Turnaround Management Team should implement a Productivity Improvement Plan in consultation and active participation from the following departments, groups and organizations:

- Turnaround Management Team
- Production

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- EHS Department
- Engineering Department
- Contractors and Subcontractors
- Specialty Contractors

To optimize resource utilization the Turnaround Management Team should implement a Productivity Improvement Program keeping the following major issues in consideration:

- Planning and Management Considerations
- Logistics Considerations
- Craft Perspective

4.6.1 Planning and Management Consideration

The Turnaround Management Team should take into consideration the following planning and management initiatives that could lead to significant gains in field productivity:

- Selection of qualified contractors base on their proven field performance
- Assignment of experienced supervision to the Turnaround Execution Team
- Timely issuance of safe work and confined space permits
- Readily availability of materials, construction equipment and tools
- Select productive work shift hours
- Buy-in of turnaround schedules by the execution groups including contractors.

4.6.2 Logistics Considerations

The Turnaround Management Team working with the contractor should develop a Logistics Plan that should ensure efficient field execution. Some of the issues addressed in the Logistics Plan include the following:

- Close proximity of support facilities to eliminate unnecessary travel and wait time
- Proper lighting for the night shift
- Readily availability of construction equipment
- Maximize erection of support facilities during the pre-turnaround phase
- Pre-fabrication prior to the turnaround execution
- Suitable lunch / break facilities for the crafts.

4.6.3 Crafts Perspective

The following steps should be taken to ensure that crafts assigned to the turnaround effort are motivated and willing to contribute to the turnaround

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success. Some of the following initiatives will result in crafts' positive attitude to enhance the turnaround productivity:

- Develop good communication channels with field crafts
- Minimize "them vs. us" attitudes
- Provide adequate craft support facilities
- Effectively manage work breaks

4.7 Review Checklist

- Implement a Productivity Improvement Plan to ensure efficient field execution.
- Assign a Field Decision Making Team to ensure timely and prudent decision-making.
- Timely issuance of safety and work permits is critical to efficient field execution.
- Perform constructability analysis to simplify construction and improve field execution efficiency.
- The Turnaround Management Team and contractors should work closely to review all the work scope and then develop plans.

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5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-F03 INSTRUCMENT CHECKING AND TESTING

INSTRUMENT CHECKING AND TESTING

IN DEVELOPMENT

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TMPP-F04 TRANSFER OF COMPLETED FACILITIES

TRANSFER OF COMPLETED FACILITIES

IN DEVELOPMENT

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TMPP-F05 COMMISSIONING AND START-UP

COMMISSIONING AND START-UP

IN DEVELOPMENT

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TMPP-G01 POST TURNAROUND FIELD ACTIVIES

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Post Turnaround Field Activities

The Turnaround Management Team is responsible to ensure that all post turnaround activities are effectively planned and efficiently executed. The Post Turnaround Phase is important as all punch list items are being completed, facilities are safely returned to operations and all turnaround resources systematically demobilized and close-out reports are compiled. Without proper post-turnaround plans, the activities for this phase can linger on, adding to unnecessary cost and increasing safety risks.

4.2 Post Turnaround Safety Considerations

The post-turnaround work is performed while the plant is starting-up or is operational, thus increasing the safety risks. To ensure safe execution of all remaining activities, the safety awareness needs to be raised to higher level. All post-turnaround activities should be planned with close interface with Operations and the Safety Departments. Each field task should be analyzed for potential safety risks and a mitigation plan should be developed.

Recognizing the need for higher safety awareness and to overcome risks, the Turnaround Management Team should ensure sufficient safety staff is assigned to the turnaround and they continue with their normal turnaround responsibilities.

4.3 Completion of Punch Lists

Operations and Maintenance should develop and maintain a punch list of activities and issues that need completion and inform the Turnaround Management Team of the status until the punch list work is completed.

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4.4 Facilities Clean Up

Housekeeping and clean up are part of the job plans, and the turnaround is not complete until housekeeping is complete and accepted by the area owners. It is the responsibility of the Turnaround Management Team and the contractors to return the facilities to operations in a safe and clean condition so that there is no safety hazard.

4.5 Removal of Temporary Facilities

All of the temporary buildings, tents, port-a-pots, etc. need to be de-commissioned and removed after they are no longer needed.

4.6 Contractor Demobilization

All of the contractors need to expeditiously demobilize and remove their equipment, buildings, etc. at the completion of their turnaround responsibilities. The Turnaround Manager should closely monitor the post turnaround responsibilities of the contractors and must approve contractors' demobilization.

4.7 Review Checklist

- All the post turnaround field activities should be planned and included in the overall turnaround schedule.
- Proper punch listing process should be followed to identify work scope that needs to be completed.
- Contractor demobilization should be closely monitored and planned to avoid excessive on-going cost changes to the turnaround.
- The Turnaround Team has a responsibility for final clean-up and return the facilities to operations in a safe work environment.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-G02 TURNAROUND PERFORMANCE EVALUATION

1.0 PURPOSE

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2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Turnaround Performance Evaluation

The Turnaround Management Team is responsible to evaluate the effectiveness of the Turnaround Management Process in the planning and execution of turnarounds. A good feed-back system along with the on-going monitoring would help in the identification of any weaknesses that need to be corrected.

All turnaround participants are empowered to recognize potential weak areas and bring those to the attention of the Turnaround Manager for corrective action. Some of the benefits of on-going performance evaluation are:

- Create an environment for constant evaluation and improvement
- Correct any weak areas immediately after recognition
- Identify and institutionalize best turnaround practices and processes
- Implement innovative solutions to improve turnaround performance

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4.2 Post-Turnaround Performance Evaluation

After the turnaround completion, one of the final tasks of the Turnaround Management Team is to perform a formal Turnaround Performance Evaluation. This is an essential and valuable learning exercise to continually improve the Turnaround Management Process. The purpose of the post-turnaround evaluation is to assess performance of all turnaround management functions, correct weaknesses and institutionalize successful practices in order to improve results on future turnarounds.

The turnaround performance evaluation is an important activity regardless of the outcome of the turnaround completion.

4.2.1 Identification of Lessons Learned

The real purpose of turnaround performance evaluation is to identify strengths and weaknesses in the company's turnaround management capabilities. This review helps to identify those practices and processes that were effective and positively contributed to the turnaround planning and execution. These issues should be reviewed, refined and included in the turnaround procedures for use on future turnarounds.

During turnaround evaluation process, lessons learned are identified and analyzed for their potential impact on turnaround results. These lessons learned are valuable to the Turnaround Management Team and assess their influence on future turnarounds. The identified lessons learned should be included in the Post Turnaround Final Report. In order for company management and the turnaround team to learn from past experience, it is important to recognize mistakes as well as successes.

4.2.2 Recognition of Successful Best Practices

Some of the lessons learned could identify new successful best turnaround practices that had a positive impact on the turnaround. These best practices should be recognized and documented in the Post Turnaround Final Report. These best turnaround practices need to be communicated to the other Mosaic facilities for their use on their turnarounds. Most importantly these successful practices should be incorporated in the Mosaic Turnaround Management Process and Procedures.

4.2.3 Sharing Turnaround Results with Other Plants

The Central Turnaround Advisor is responsible for communication and review of all Mosaic turnarounds' results, lessons learned, and successful practices with the Turnaround Management Teams.

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4.3 Organizational Structure Evaluation

As part of the turnaround performance evaluation, the Site Leadership Team and the Turnaround Manager should evaluate the effectiveness of the organizational structure and turnaround's staffing levels. In evaluating the turnaround organization performance, the following issues should be covered:

- The effectiveness of the Turnaround Management Team and Organization Structure
- Quality and caliber of staff compared to turnaround needs
- Communication and organizational interfaces among the various company and outside participants
- Team environment versus organizational conflicts
- Level of turnaround staffing and timing of assignment as compared to turnaround needs
- Gap analysis of proper staffing levels versus inadequate turnaround staffing

4.4 Turnaround Staff Evaluation

One of the key parts of the post-turnaround evaluation is the performance review of staff assigned to the Turnaround Management Team. Since the Turnaround Management Process spans over several phases, the personnel review should be an on-going process.

In a matrix turnaround organization, other managers who work with the team member may also contribute in the evaluation as well. The Site Leadership Team should consider making necessary changes to the future Turnaround Management Team based on the staff's performance evaluation. The basic criteria for appraising team member performance include the following:

- Quality of work
- Attitude and work habits
- Technical ability
- Cost consciousness
- Creativity and innovation
- Team player and leadership qualities
- Communication skills
- Contribution to turnaround success

4.5 Contractors' Performance Evaluation

As part of the turnaround evaluations, unbiased and accurate feed back on contractors' performance is valuable and would have a strong bearing in the development of contracting strategy for future turnarounds. Contractors should be evaluated on their

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workmanship quality and performance of the work assigned to them. A sample form for Contractor Evaluation is shown in the Attachment.

An effective contractor performance evaluation will, at the minimum, measure performance against such common criteria as:

- Safety, health and environmental performance
- Management effectiveness and team work
- Quality of supervision and staffing
- Compliance to procedures, policies and guidelines
- Schedule and cost performance as compared to baseline
- Quality of work and deliverables
- Overall contributions to turnaround success

4.5.1 Contractors and Vendors Input

As part of the turnaround performance evaluation process, Mosaic should solicit input from consultants, contractors, vendors and repair shops. An open dialogue will help to get their true and unbiased feedback as it relates to organizational interface, contracting, planning, logistics, etc.

4.6 Implementation Plan of Recommendations

Mosaic is committed to continuously enhance the company's turnaround management capabilities. The Turnaround Manager after review of the Final Post Turnaround Performance Report with the Turnaround Management Team should develop an action plan to implement these turnaround improvement recommendations. The following steps are taken to ensure the implementation of recommendations:

- Prioritize the recommendations and action items
- Assign individuals to each task to ensure its timely completion
- Establish completion deadlines
- Institutionalize the solutions for application on future turnarounds.

4.7 Review Checklist

- The Turnaround Performance Evaluation should be a continuous process starting from the planning to the post turnaround phases.
- The Post Turnaround Performance Evaluation should be completed within 2-4 weeks after turnaround completion.
- Contractors' Performance Evaluation should be shared with other company plants.
- Implementation plan should be developed to implement recommendations and improvements in a timely fashion.

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5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Contractor's Performance Evaluation

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TMPP-G03 CONTRACT CLOSE-OUT

CONTRACT CLOSE-UP

IN DEVELOPMENT

PHASE 2

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TMPP-G04 TURNAROUND CLOSE-OUT REPORTS

TURNAROUND CLOSE-OUT REPORTS

IN DEVELOPMENT

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TMPP-H01 PLANT MANAGEMENT AND LEADERSHIP

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Plant Management and Leadership

The Site Leadership Team plays a pivotal role in guiding the turnaround participants to work as an integrated team and achieve highest performance on the turnarounds. The early involvement of the Site Leadership Team and their leadership role are essential elements in mobilizing plant's staff to focus their efforts in meeting turnaround goals as well as their active participation from the earliest planning through the execution phases.

The Site Leadership Team's participation and leadership gives the turnaround management function the necessary visibility, credibility and support that are essential to build turnaround focus and success.

4.2 Turnaround Management Capabilities

Mosaic's Corporate Management and Site Leadership Teams are committed to continually enhance the company's turnaround management capabilities to ensure success on plant turnarounds. It will take company management's commitment and leadership to implement change and improve strategies. The company must have a long-term perspective in order to implement new approaches and systems to improve the company's turnaround capabilities. To achieve this objective, the company is implementing the following strategies:

- Development of a standard Turnaround Management Procedures Manual identifying the best management processes, practices and modern planning techniques.
- Training and indoctrination of company staff in the Turnaround Management Procedures Manual.

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- Continuous guidance from turnaround management consultants and experts.
- Participation of company's turnaround staff in industry symposiums, public seminars, etc.
- Participation in Turnaround Management Benchmarking Programs and continuous dialogue with industry peers and leaders.

4.3 The Site Leadership Team

The Site Leadership Team provides the executive level prospective and guidance to all turnaround participants in the effective planning and efficient execution of plant turnarounds. The principal focus is to ensure that turnaround concerns and issues get the highest attention. The Site Leadership Team's regular meetings provide an effective forum for quick decision-making and resolution of any conflicts facing the turnaround.

The Site Leadership Team consists of Plant Manager, Maintenance Manager, EHS representative Turnaround Advisor and Turnaround Leaders for each department participating in Turnaround activities.

4.3.1 The Site Leadership Team should address turnaround issues such as:

- Ensure highest focus on safety performance and environmental compliance.
- Define the Site Leadership Team's expectation from the Turnaround Management Team.
- Approve turnaround goals for safety, schedule, mechanical integrity, cost, etc.
- Ensure focus on key turnaround performance criteria.
- Ensure qualified organization and facilitate timely staffing of the turnaround team.
- Guide in the complete work scope development based on approved turnaround criteria (capital and expense).
- Timely decision-making and expediting resolution of problem areas and conflicts.
- Prudent management of scope additions after the work scope cut-off date and during the turnaround execution.
- Guide in the development and establishment of cost and schedule baseline.
- Oversee the contractor selection and material procurement process.

4.4 Executive Turnaround Leadership Forum

To clearly define Site Leadership Team's guidance, support and leadership role in the effective turnaround planning and efficient execution, an Executive Turnaround Leadership Forum should be facilitated to kick-off the planning effort on every turnaround.

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All members of the Site Leadership Team should attend this brainstorming session to clearly communicate their performance expectations and/or concerns, and develop executive guidelines to ensure turnaround success.

This Executive Turnaround Leadership Forum will cover and address following issues:

- Clearly outline and describe Site Leadership Team's turnaround performance expectations/vision.
- Understand Site Leadership Team's turnaround concerns and functional areas that are perceived to be weak and need reinforcement.
- Establish Site Leadership Team's leadership and support role in guiding the turnaround management staff and other participants.
- Develop executive initiatives to create high performance and synergistic work environment that is suitable for pacesetter turnaround results.
- Ensure that all department leaders fully appreciate the importance of their early participation in the planning process and contribute in implementing high performance initiatives.
- Establish an on-going forum to share the turnaround planning progress and related issues with the Site Leadership Team for their information, approval and guidance.

4.5 Site Turnaround Leader

In order to ensure that the Turnaround Management Team gets continuous support and maintains communication with the Site Leadership Team, a Site Turnaround Leader should be assigned for each turnaround. Site Turnaround Leader is typically a member of the Site Leadership Team who is knowledgeable in the Turnaround Management Process and understands the planning and execution challenges of a turnaround.

Assignment of a Site Turnaround Leader should ensure that essential and sufficient resources are available to the Turnaround Management Team for effective planning and efficient execution. The Site Turnaround Leader should continually reinforce the turnaround vision, provide leadership in implementing turnaround improvement initiatives and ensure achievement of turnaround goals.

The fact that a senior company executive is propagating these high level initiatives gives the Turnaround Management Team the necessary visibility and credibility as they plan and manage the turnaround. The Site Turnaround Leader should not only ensure that company procedures and systems are being implemented, but also the Turnaround Management Team stays focused to achieve turnaround goals.

4.6 Review Checklist

An Executive Turnaround Leadership Forum should be conducted to ensure Site Leadership's support to the turnaround management process.

- Qualified and experienced staff are selected and assigned to the turnaround management teams.
- Turnaround Organization Charts are developed for the planning and execution phases of each turnaround.

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- A Site Leadership Team should provide on-going guidance and support to the Turnaround Management Team.
- A Site Turnaround Leader should be assigned to provide continuous executive level support and a communication channel to the Site Leadership Team.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-H02 ORGANIZATION CHARTS AND INTERFACES

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Organization Charts and Interfaces

The turnaround organization chart is an important tool to ensure clear communication, coordination and an integrated team effort in the planning and execution of plant turnarounds. For each turnaround a specific organization chart should be developed to reflect the turnaround's staffing needs and assignment timing for each team member.

Separate turnaround organization charts should be developed/modified as necessary for each of the Turnaround Phases as outlined in Mosaic's Turnaround Management Process. This will ensure that proper and qualified resources are assigned to focus on activities during each of these planning and execution phases.

The Turnaround Organization Chart should reflect the staffing needs, hierarchical structure, interfaces and the time commitment for every position. A well-thought-out organization chart achieves the following objectives:

- Defines staffing needs for a specific turnaround
- Established organizational interfaces
- Identifies reporting structure
- Clarifies part-time vs. full-time responsibility
- Improves turnaround communication
- Defines decision-making process
- Establishes authorities and accountabilities

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4.2 Cross Functional Organization Chart

Planning, managing and executing a plant turnaround is a plant wide and cross-functional responsibility. Almost all departments at the plant have a role to play or to some degree influence the turnaround planning and execution functions.

The Turnaround Manager should ensure that the Turnaround Management Team has representation from all organizations who are directly or indirectly involved in the turnaround planning and execution. The following departments play significant roles in the turnaround management and that should be reflected on the organization chart:

- Site Leadership Team
- Reliability and Inspection
- Business and Marketing
- Project Engineering
- Finance and Accounting
- Procurement and Materials Management
- Human Resources
- Contracts and Purchasing
- Production
- Safety, Health and Environment
- Maintenance
- Warehousing and Workshops
- Technical and Process
- Security, etc.

The Turnaround Manager should ensure that the proper roles, responsibilities and interfaces are established for all turnaround participants in order to facilitate good communications, coordination and decision-making.

4.3 Organization Chart for Planning Phase

Since the turnaround Detailed Planning Phase could span over 8-12 months, depending upon the size and complexity of the turnaround, it is recommended that an Organization Chart reflecting the staffing needs of the Detailed Planning Phase should be developed.

The Organization Chart for the Planning Phase should reflect the resources required for front-end loading and planning activities, *e.g.*:

- Work Scope Development
- Mechanical Integrity Assessment
- Inspection and Operations Reliability
- Technical and Process
- Contract Planning
- Materials Procurement
- Capital Projects
- Safety, Environmental and Regulatory Compliance
- Turnaround Planning and Cost Control

As the above list suggests, turnaround planning takes a broader outlook than the traditionally perceived function for developing only the turnaround schedule plans. To staff the turnaround organization for the planning phase, the Turnaround Manager will

have to reach out and get resource commitments from various plant departments and organizations.

It is important that the organization chart be fine tuned to reflect the turnaround's unique circumstances and the plant's work environment. Depending upon the size and complexity of the turnaround, the positions and functions as shown in the organization chart can be further consolidated or expanded.

Each position on the Organization Chart should also identify the percent of the assigned individual's time devoted to the turnaround effort.

An organization chart for the planning phase of a typical turnaround is shown in the Attachments.

4.4 Organization Chart for Execution Phase

To effectively manage the Execution Phase Activities, a separate organization chart should be developed for the Execution Phase of the turnaround. It is recommended that the organization chart for the execution phase be developed at least 4-6 months before the turnaround start date. This organization chart will have many of the same players from the planning phase but the focus in on the field supervision.

It is important that whenever possible we should maintain continuity of staffing from the planning to the execution phases. The Turnaround Manager should keep in mind that several of these positions will require staffing for both the day and night shifts. The turnaround organization chart for the execution phase actually encompasses three different phases as outlined in the Turnaround Management Process:

1. Pre-Turnaround
2. Turnaround Execution
3. Post-Turnaround and Evaluation

4.5 Turnaround RACI Chart

The RACI Chart is a responsibility assignment system that brings structure and clarity to assigning the roles people play within a Turnaround Management Team. It is a simple grid system that you can use to clarify people's responsibilities and ensure that everything the team needs to do is taken care of.

When several people work on a turnaround, it is easy to assume that someone else is taking care of a particular detail or assignment. It is also easy to point fingers and assign blame when one of those jobs is done poorly or not done at all.

With complex and time-sensitive projects, it's often worth taking the time to think through the roles that you and your team members must play in every task that your team undertakes. Without this clarity, you will most-likely find gaps, duplication and confusion. In these situations, the delegation of tasks and other responsibilities can be too important to leave to chance.

The RACI Chart allows for each task step to be identified; then each stakeholder and their responsibilities can be identified. The resulting chart can be scrutinized for opportunities for improvement. With a standard RACI Chart, there are four responsibilities and issues to consider with each opportunity:

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Responsible [R] – This is the person or group responsible for performing a task. Bear in mind the adage that when nobody is responsible for getting something done, then nothing gets done. Also, a similar situation can occur when too many people are potentially responsible with little to no coordination and oversight to ensure that the task is completed. Another issue to consider is when a person has lots of "R's". Are they doing too much?

Accountable [A] – This is the person who is held accountable for the task being complete. In some cases, risks can be managed by segregating the responsible and accountable roles. In general, one person should be accountable for a task being performed. At the same time, if a person is accountable for most of the steps in a procedure, one must consider if there is a segregation of duties issue wherein the person(s) controls too much.

Consulted [C] – These are the people communicated with prior to a task being performed. Essentially, their input is sought and factored in prior to any action. As the number of parties consulted increases, the speed with which action can be taken decreases. Conversely, too few and improper decisions may be made.

Informed [I] – These are the parties who are notified about a task after it has been performed. If the correct parties aren't informed in some situations, then incidents can arise from groups wondering what changed. At the same time, if there are lots of people being informed, is it necessary?

RACI Charts are very useful both in terms of understanding the current responsibilities within a given process and also for discussing revised processes, clarifying roles and responsibilities, etc.

4.6 Review Checklist

- A Turnaround Specific Organization Chart should be developed for the planning phases.
- An Organization Chart for the Field Execution Phase should be developed 3-4 months before the turnaround.
- A Turnaround RACI Chart should be developed to describe varying roles and responsibilities for each position.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Turnaround Organization Chart – Planning Phase
- Turnaround Organization Chart – Execution Phase
- Turnaround Management RACI Chart

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TMPP-H03 TURNAROUND MANAGEMENT TEAMS

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Turnaround Management Team

The success of a turnaround is largely dependent on the assignment of a qualified and experienced Turnaround Management Team. The turnaround staff should be knowledgeable in all the best turnaround management procedures, practices and planning techniques outlined in this manual.

The Mosaic's Site Leadership Teams are committed to ensure that all the required resources will be assigned to the turnaround teams in a timely manner. The Turnaround Management Team should be staffed from all pertinent organizations responsible for the planning and execution of successful turnarounds.

Proper roles, responsibilities and interfaces should be established for all the turnaround staff to facilitate good communication, effective planning and efficient execution of plant turnarounds.

4.2 Turnaround Manager

The Turnaround Manager is responsible for the planning, managing and execution of all the elements of a turnaround. The Turnaround Manager has overall responsibility to ensure a safe, cost-efficient and successful turnaround. This person is responsible for integrating planning requirements, systematic execution of work for the maintenance, production, and engineering, safety, and other pertinent activities.

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4.2.1 Turnaround Manager's Responsibilities

The Turnaround Manager serves as the principal communication channel among the plant management, turnaround team and all participants. Some of the responsibilities of the Turnaround Manager are:

- Provide leadership and guidance to the turnaround team and all the participants during the planning and execution phases.
- Ensure the staffing of the turnaround team with qualified and experienced staff.
- Clearly define the turnaround organization, roles, responsibilities and interfaces among all the turnaround participants.
- Facilitate and provide input to the Turnaround Management Team.
- Facilitate in the development, communication and achievement of turnaround goals and objectives.
- Ensure turnaround participants' consistent focus on turnaround Key Performance Indicators (KPI's).
- Ensure focus on safety considerations in every aspect of turnaround planning and execution.

4.3 Turnaround Staff Selection

The Site Leadership Team and the designated Turnaround Manager work together to select and assign the Turnaround Management Team for a specific turnaround. Most importantly, they work together to develop a time plan to assign the turnaround team members. Some of the staff may work part time on the turnaround planning effort before joining on a full time basis.

The staffing of that organization primarily will come from within the company, affiliates, or from outside organizations such as consulting/contracting companies. In selecting the turnaround team, the following qualification criteria should play an important part:

- Team player and work well with others
- Experienced in turnaround management
- Good communication skills
- Commitment to follow company's turnaround procedures

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- "Can-do" and positive attitude
- Decision-making abilities
- Analytical ability to take corrective action

4.4 Turnaround Staffing Timing

Once the turnaround organization chart is defined, the next important step is to determine when to assign the staff to the turnaround team. The assignment process should be staged in these steps:

- Designation of Individuals
- Part-time Assignment
- Full-time Assignment

It is important that each position should be classified as part-time or full-time based on their time commitment to the turnaround. This eliminates confusion and ensures that the turnaround management effort is consistent with the performance expectations from that position and the assigned individual.

4.5 Review Checklist

- The Turnaround Management Team should put major emphasis on communication and ensuring every person on the team clearly understands their roles and responsibilities.
- Qualified and experienced staff are selected and assigned to the Turnaround Management Teams.
- Turnaround Organization Charts are developed for the turnaround planning and execution phases.
- A specific Turnaround Management Team is in place to plan and execute each plant turnaround.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-H04 JOB DESCRIPTIONS AND RESPONSIBILITIES

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Job Descriptions and Responsibilities

Proper and clear definition of roles and responsibilities for every turnaround participant is essential for good communication and to avoid any organizational conflicts. This section describes the job descriptions of all key positions who will be involved in the planning and execution of plant turnarounds.

Depending upon the size and magnitude of the turnaround, the job descriptions may need to be modified to reflect the needs of a specific turnaround. It is important that each turnaround team staff should review their job description and confer with the reporting supervisor and resolve any ambiguities, grey areas, or conflicts.

For effective utilization of company's resources, it is imperative that the turnaround staff makes every effort to stay focused on their areas of expertise and not deviate into others' areas of responsibility. This will ensure efficient turnaround effort and avoid unnecessary conflicts.

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4.2 Job Descriptions

4.2.1 Turnaround Manager:

Turnaround Manager is in charge of the Turnaround. He/she is responsible for planning, coordinating, managing and execution of turnaround work associated with maintenance, production, engineering, and other disciplines in order to achieve turnaround goals. The Turnaround Manager ensures teamwork and cooperation among all capital project and turnaround participants. The Turnaround Manager provides leadership in organizing necessary resources to successfully develop work scope, procure materials, select contractors, establish cost budget and develop schedules for the turnaround. As an example this position may be filled with a Plant manager, Maintenance manager, or a consultant/ contract resource depending on the size and complexity of the turnaround.

4.2.2 Maintenance Turnaround Leader:

Maintenance Turnaround Leader has the overall responsibility for a safe and effective execution of all maintenance activities during the turnaround. This person is responsible for the timely definition of the maintenance work scope during the planning phase. The Maintenance Turnaround Leader ensures that all issues and concerns of the maintenance group are addressed during the planning and execution phases. Also, this person is responsible for developing logistics plans that ensure a conflict-free and efficient field execution. Responsibilities include coordination with contractors to provide adequate facilities for their offices, lay-down areas and efficient movement of crafts, traffic, materials and equipment. This position may be filled by a current maintenance superintendent.

4.2.3 Turnaround Planner/ Scheduler:

The Turnaround Planner/Scheduler facilitates the turnaround planning effort with all participants in a timely work scope definition and the development of effective turnaround plans. This person plays a lead role during the strategic planning, and execution phases to ensure that the final work scope is translated into a budget control plan, detailed schedule, and in establishing manpower performance baseline. This position may be an in-house planner/ scheduler or a contract planner/ scheduler as needed.

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4.2.4 Turnaround Capital Project Leader:

The Capital Project Leader coordinates all the engineering and procurement activities during the planning phase to ensure their timely completion during the turnaround window. The Capital Project Leader is responsible in providing close coordination with the turnaround team and in ensuring total integration of capital and maintenance work in order to optimize the planning effort, resource utilization and efficient execution. This position may be filled with a project engineering manager, project engineer or contract project manager depending on the size and complexity of the turnaround.

4.2.5 Turnaround Production Leader:

The Production Leader is responsible for ensuring that all production activities and requirements are incorporated in the turnaround plans. The Production leader is responsible for the development of safe unit shutdown and startup plans and their optimized integration during the turnaround planning and execution phases. This position may be filled with a production superintendent, production coordinator, or designee as needed.

4.2.6 Turnaround Advisor:

The Turnaround Advisor assists the Turnaround Leadership Team and the Turnaround Leader during the planning and execution phases by providing state-of-the-art information in order to ensure a successful turnaround. The Turnaround Advisor will evaluate the effectiveness of the turnaround plans, efficient execution of the work scope and the contractor's performance. Also, he will provide corrective recommendations on all observed deficiencies in a timely manner to the turnaround management team. He will observe and document all facets of the turnaround planning and execution to ensure achievement of turnaround goals.

4.2.7 Administrative Support:

The administrative support person is responsible for all T/A related records, de-briefing notes and reports, daily KPI reports, final T/A report and scheduling de-briefing meetings, etc. This position may be filled with in-house clerical resources or contractor support as needed.

4.3 Review Checklist

- Job descriptions should be reviewed and updated to reflect turnaround-specific needs and work environment.
- The job description for each turnaround team member should be broken down by each of the phases as outlined in the Turnaround Management Process.
- Each position on the Turnaround Organization Chart should also specify the percentage of time commitment to the turnaround.

5.0 REFERENCES

- Turnaround Management Procedures Manual

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6.0 ATTACHMENTS

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TMPP-I01 HEALTH AND SAFETY

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Health and Safety

Mosaic is committed to a safe workplace and protecting the Health and Safety of its work force, contractors and the general public through the use of comprehensive and systematic Health and Safety management systems.

All turnaround safety programs must stress the importance of safety through all phases of turnaround planning and execution. Both the Mosaic and contractors' managements should emphasize the need for safety and all the execution plans must focus on meeting highest health and safety performance.

4.2 Health and Safety Responsibility

The Turnaround Management Team plays a key role to effectively plan all the Health and Safety issues before the turnaround to improve the safe work practices. The turnaround team must implement consistent definitions and safe work practices to ensure that all turnaround participants use and understand the same language and Health and Safety systems.

The Turnaround Management Team along with the Health and Safety Department is responsible for implementing systems that drives the compliance for all company policies and regulatory required safety measures. The Turnaround Management Team should:

- Develop an overall turnaround-specific Health and Safety Plan
- Determine safety staffing requirements
- Constantly observe work area and take corrective action as required

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- Continually evaluate program for maximum effectiveness
- Maintain records of all injuries, incidents, unsafe acts, etc.

4.3 Turnaround-Specific Health and Safety Plan

To achieve the turnaround's highest health and safety goals, a turnaround specific Health and Safety Plan should be developed. The Turnaround Management Team along with the support of the company's safety and health groups should develop this plan specific for every plant shutdown and turnaround.

In many ways, the Health and Safety Plan is an extension of the company's existing safety guidelines, but additionally it addresses health and safety considerations which are unique to the turnaround. It is a comprehensive document for use by both the company's and contractors' staffs in conveying these requirements and for creating a safe turnaround work environment.

4.3.1 Purpose

Health and Safety Plan serves as a single source document to communicate turnaround-specific health and safety requirements and guidelines to all Mosaic and contractor personnel. The principal objectives of a Health Safety Plan are:

- Achieve the turnaround's health and safety goals
- Create a safe work environment
- Establish safety training and orientation requirements
- Promote safety awareness and safe work practices
- Keep health and safety issues as key turnaround focus
- Ensure contractors' integration of safety programs

4.3.2 Implementation Approach

The Turnaround Management Team with the guidance of the Health and Safety Department is responsible for the development of a turnaround-specific Health and Safety Plan during the earliest phases of turnaround planning. This comprehensive plan outlines all the Health and Safety requirements that are applicable to the turnaround and helps in promoting the creation of a safe work environment.

4.3.3 Health and Safety Plan Contents

Safety is a principal objective of any Mosaic turnaround. The Health and Safety Plan addresses all preventive, precautionary and regulatory environmental and safety requirements that must be implemented and adhered to during the turnaround. At the same time, any exceptions to company's environmental and safety requirements during the turnaround are also addressed in this document. Some of the key sections, contents, and procedures included in a typical Health and Safety Plan include:

- Health and Safety Organization
- Health and Safety Training and Orientation

- Safety Meetings
- Lock-out-Tag-out Permitting
- Scaffolding and Ladders
- Confined Space Entry
- Fire Watch Requirements
- Hand and Portable Power Tools
- Hot tapping
- Assured Electrical Equipment Grounding Conductor Program
- Ground Fault Interrupters
- Fall Protection
- Fire Retardant Clothing
- Asbestos Abatement Guidelines
- Lead Abatement Guidelines
- NOx Guidelines
- Respiratory Protection
- Toxic Substance Control
- First Aid and Medical Procedures
- Hearing Protection
- Radiography
- Accident Reporting and Investigation

Based on the size, magnitude and complexity of the turnaround, the Health and Safety Plan can be customized to address specific issues and concerns.

4.3.4 Turnaround Safety Team

The Turnaround Management Team will develop the turnaround safety team with designated safety observers and safety coordinators that will pick up observations, audits, reports etc. for each shift.

4.3.5 Compliance to New Regulatory Requirements

The Health and Safety Department is responsible to communicate any new regulatory requirements and the turnaround safety team will assist in compliance monitoring

4.3.6 Work Scope Safety Risk Assessment

Each job plan involves a safety risk assessment and the Tool Box safety meetings, Take Two Program, and Safety Audits help identify additional safety risks.

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4.3.7 Best Safe Work Practices

The Safety Audits, incident investigations, near misses, and observations identify the best safe work practices along with the post turnaround debriefing process. These practices are captured in the "Lessons Learned" and utilized in the Strategic Planning and Work Scope Development Phase of the next turnaround process

4.3.8 Lock-out/Tag-out Guidelines

Each turnaround has a specific lock-out/tag-out guidelines and procedures that are communicated to all work groups prior to the execution phase.

4.3.9 Turnaround Safety Audits

Turnaround safety audits are required of Mosaic and contractors. Examples of different safety audits are attached for review and all the audit forms are available at the pre-turnaround contractors meeting. See attached presentation.

4.3.10 Emergency and Evacuation Procedures

The plant specific emergency and evacuation procedures are covered in the pre-turnaround contractors meetings. See example meeting presentation.

4.3.11 Incident Reporting and Investigation

The plant specific incident reporting and investigation procedures are covered in the pre-turnaround contractors meetings.

4.3.12 Fall Protection

Plant specific elevated work access must be identified and addressed in the pre-turnaround contractors meetings. Mosaic's requirement is 100% fall protection 100% of the time.

4.3.13 Personal Protective Equipment

The personal protective equipment requirements matrix and procedures are covered in the pre-turnaround contractors meetings. See attached matrix.

4.3.14 First Aid Facilities

The plant specific first aid facilities locations are covered in the pre-turnaround contractors meetings and on the logistics team plot plan.

4.4 Review Checklist

- A turnaround-specific Health and Safety Plan is developed.
- Contractors must develop their own Health and Safety Manual to meet Mosaic's safety goals.
- A turnaround-specific Health and Safety Training and Orientation Program must be developed.
- All turnaround work scope is reviewed by a Health and Safety group to ascertain permit requirements and special compliance requirements.

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- Turnaround Safety Team has been defined for both Mosaic and the contractors.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Equipment Opening PPE Matrix
- Confined Space Audit
- Hot Work Audit
- Safety Audit Form

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TMPP-I02 ENVIRONMENT

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Environment

Mosaic is committed to complying with the regulatory environmental regulations and company guidelines during the turnaround planning and execution. The Turnaround Management Team will work closely with the Environmental Department to define responsibilities of all participants in order to prevent any environmental incident.

Standard environmental procedures for solid waste disposal, wastewater drainage, and air quality will be established and implemented on all company turnarounds.

The Environmental Department, working with the Turnaround Management Team, will play a key role to ensure environmental compliance. An Environmental Representative will be designated to work with the Turnaround Manager in ensuring total compliance to environmental regulation and avoid any environmental incident.

4.2 Turnaround Environmental Plan

During the planning and execution of a turnaround, identification and control of hazard is a key responsibility of all turnaround participants. The Environmental Field Representative will be responsible to:

- Assist the Turnaround Management Team in understanding and complying with all the environmental requirements.

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- Coordinate with Turnaround Management Team to assess the project scope relative to regulatory requirements for air construction permitting.
- Make the required pre-notifications for asbestos removal.
- Review waste procedures to ensure they meet the environmental requirements of the turnaround.
- Determine and communicate appropriate tagging and labeling requirements.
- Provide environmental guidelines and training as needed.
- Provide required state and federal notifications through proper channels.
- Coordinate the disposal of hazardous wastes.
- Provide documentation requirements and post- turnaround assessment.

4.3 Compliance to Regulatory Requirements

The Environmental Representative should communicate to the Turnaround Management Team the environmental guidelines in order to ensure compliance to the regulatory requirements and company policies during the turnaround.

4.4 Compliance with Air Permitting Requirements

The Turnaround Management Team will identify all maintenance activities associated with air pollution emission units and communicate these activities with the Environmental Representative. All activities associated with existing equipment will be assessed for permitting requirements in accordance with the Routine Maintenance Repair & Replacement guidelines. All activities involving new installations will undergo air permitting review. NOTE: regulatory permitting for air emission sources can take a significant amount of time. The Turnaround Management Team must identify and communicate activities as early as possible to assure that permits can be obtained in time.

4.5 Hazardous and Waste Guidelines

The Environmental Representative is responsible to communicate to the Turnaround Management Team and ensure compliance of all the regulatory and company's Hazardous and Waste Guidelines.

It is important that the Environmental Representative is part of the Turnaround Management Team from the earliest planning phases in order to have all Hazardous and Waste requirements incorporated in the turnaround plans.

The Mosaic's Hazardous and Waste Guidelines are attached.

4.6 Waste Stream Plans

The Turnaround Management Team with the assistance of Environmental, Maintenance, Engineering and Production Departments must ensure that there are adequate procedures in place to manage the Waste Streams during the turnaround execution. Earlier waste stream planning is essential to minimize reactive management and potential violations of regulatory requirements and company policies.

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4.7 Environmental Incident Reporting and Responsibility

During the execution of a turnaround, identification and control of Environmental Incidents is a key responsibility of all turnaround participants. The Environmental Representative will be responsible to communicate the requirements and facilitate the processing of the documentation and implementation of remedial actions.

4.8 Review Checklist

- Ensure Environmental Compliance and preventing any Reportable Environmental Incident is a top turnaround objective.
- Designate an Environmental Representative to work with the Turnaround Management Team.
- Make the necessary pre-notifications to the company's Environmental Department for all repairs and testing to be completed during the turnaround.
- Indoctrinate the turnaround staff and contractors with the mandatory environmental requirements and provide them appropriate training.
- Develop and manage all the Waste Streams generated during the turnaround in compliance with Company policies and regulatory requirements.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

- Mosaic 5-Factor Assessment Process
- Repair/Replacement Projects
- Air Permitting Process Flow
- Waste Management Matrix

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TMPP-I03 SAFETY AND WORK PERMITS

SAFETY AND WORK PERMITS

IN DEVELOPMENT

PHASE 2

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TMPP-I04 CONTRACTORS' SAFETY RESPONSBILITIES

CONTRACTORS' SAFETY RESPONSIBILITIES

IN DEVELOPMENT

PHASE 2

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TMPP-I05 SAFETY TRAINING AND ORIENTATION

SAFETY TRAINING AND ORIENTATION

IN DEVELOPMENT

PHASE 2

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TMPP-I06 SECURITY PLAN

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Security Plan

This section identifies the guidelines for security management during turnarounds. Extraordinary entry procedures may be required on a temporary basis during turnarounds that are not practical during normal daily plant operations. This will facilitate efficient ingress, egress, emergency management, and personnel tracking while enforcing regulatory requirements for entry to secure and restricted access areas. The Security Department will provide a security representative during planning and implementation phase meetings and will provide a full time presence dedicated to the security of the turnaround during the execution phase. For detailed security guidelines review the EHSS intranet web site.

4.2 Definitions:

Mosaic Fertilizer employee – any person that is currently employed as a full time employee by Mosaic Fertilizer.

Contractor – any person, company or firm that enters Mosaic property for the purpose of conducting business or contracted services with Mosaic Fertilizer.

Visitor – any other person who visits Mosaic property not specifically identified to include vendors, salesmen, delivery persons, estimators, etc. whether escorted or not.

4.3 Plant Entry Guidelines

Facility access control is essential for employee safety as well as the protection of company assets and personal property. Employee commitment is a necessary element of good security.

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Entry to the facilities is regulated by law in some cases. Mosaic Fertilizer has established policies to regulate entry by employees, vendors, contractors and delivery personnel. Mosaic policy and procedures include limiting access and performing screening and inspections for entry to the secure areas of covered facilities. Personnel must meet background criteria established by Mosaic's Procurement Department prior to entry. Contractors are required to possess approved entry credentials that will be verified by the security representative at each point of entry.

4.4 Turnaround Vehicle Policies

To ensure efficient and timely entry and verify proper credentials for approved contractor's entry into the facility, this procedure requires continued compliance by contractors and enforcement by security at the facility entry points. Compliance with this policy is essential to promote safe and efficient entry to the facility.

4.5 Review Checklist

- A Turnaround Specific Security Plan is developed for each turnaround.
- Plant Entry Guidelines are established to manage traffic and avoid congestion.
- All contractor vehicles must get a permit to enter the plant and turnaround area.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-J01 MECHANICAL INTEGRITY

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Mechanical Integrity

The purpose of the Mechanical Integrity Program is to assure the continued mechanical reliability of the plant equipment in order to ensure safe and reliable operations of the facilities. Ensuring Mechanical Integrity of plant facilities is the primary purpose driving a turnaround. The major planning focus is to identify the work scope that is essential to enhance Mechanical Integrity and increase equipments' life cycle. In implementing the Mechanical Integrity, the following equipment should be considered to be included in the program:

- Pressure vessels and storage tanks
- Piping systems (including piping components, such as valves)
- Relief and vent systems and their controls
- Emergency shutdown systems
- Interlock, alarm and control systems
- Pumps and rotating equipment
- Mechanical Integrity Assessment

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As part of the turnaround planning, it is recommended that a thorough Mechanical Integrity Assessment should be done for the facilities earmarked for a turnaround. The turnaround participants must recognize that the principal focus of the turnaround is to enhance the facilities' mechanical integrity and operational reliability.

A cross-functional group with representatives from the inspection, reliability, production, maintenance and technical groups should form the core team to conduct the Mechanical Integrity Assessment for the facility.

The recommendations from the Mechanical Integrity Assessment along with justifications should be submitted to the Turnaround Work Scope Team for their review and approval. If some recommendations entail significant cost then those should be submitted to the Site Leadership Team for their consideration and final approval.

4.2 Equipment History and Performance Records

The Inspection Department with the help from the production and maintenance departments is responsible to maintain performance record and repair history of all plant equipment. As part of the turnaround work scope development the Work Scope Review Team heavily relies on the Inspection Department and their recommendations based on equipment history records to develop a good Turnaround Work Scope List.

Equipment History and Performance Records should be continually updated as new information becomes available. At the completion of each turnaround, Inspection Department collects all the information related to inspections and work performed on the equipment and documents that in the Equipment History. In addition, Inspection Department should also make recommendations about the work that needs to be done during the next scheduled turnaround.

The Inspection Department should complete their close-out inspection report within four (4) weeks of the turnaround completion.

4.3 Review Checklist

- Mechanical Integrity should always remain the number one priority for the turnaround.
- Mechanical Integrity Program should be conducted to ascertain their mechanical integrity needs of the plant.
- All the equipment history and repair records should be kept current to help develop their turnaround work scope.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-J02 INSPECTIONS DURING PLANNING PHASE

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Inspection During Planning Phase

This section identifies some of the Quality Control and Inspection Guidelines and company/departmental procedures that influence the planning of plant turnarounds. The Turnaround Management Team should be aware of these procedures and requirements and routinely seek advice from the appropriate departments to incorporate their impact on turnaround planning.

The Turnaround Management Team should identify key individuals within various departments for coordination and ensuring their participation during the planning phase. This will ensure that turnaround planning is in total compliance with the company's Quality Control and Inspection guidelines and procedures.

4.2 Turnaround Inspection Plan

The Turnaround Inspection Plan is developed with information from several sources including but not limited to inspection, reliability and equipment history. All equipment should be evaluated based on present operational data, past repair history, inspection needs and its future operational requirements. The methods and the extent of NDE shall be evaluated to assure they can adequately identify the damage mechanism and the severity of damage.

Examinations must be scheduled at intervals that keep the following issues into considerations:

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- Type of damage
- Rate of damage progression
- Tolerance of the equipment to the type of change
- Probability of the NDE method to identify the damage
- Maximum intervals as defined in codes and standards

4.3 Turnaround Inspection Requirements

The Turnaround Inspection Plan should contain the inspection tasks and schedule that are required to monitor mechanisms and to assure the mechanical integrity of the equipment (pressure vessels, process piping, circulating tanks, and pressure relieving devices). The requirements should:

- Define the type(s) of inspection needed, e.g. internal, external
- Identify the next inspection date for each inspection type
- Describe the inspection and NDE techniques
- Describe the extent and locations of inspection and NDE
- Describe the surface cleaning requirements for inspections and examinations
- Describe the requirements of any needed pressure test, e.g. type of test, test pressure, and duration
- Describe any required repairs
- Describe the types of damage anticipated or experienced in the equipment
- Define the location of the damage
- Define any special access requirements
- Identify pre-turnaround vendor inspections
- Describe extent and locations of inspections for installed equipments

4.4 Non Destructive Testing for Turnaround Work Scope Identification

Inspection should identify what equipment will require Non Destructive Examination (NDE) and verify if the equipment requiring NDE can be performed on the pre-turnaround or if it can only be performed during the turnaround.

Identify the method of NDE to be performed for the equipment requiring inspection, and whether the inspection will require external or internal access.

Describe the surface cleaning requirements for inspections and examinations.

4.5 Inspection at Vendor and Fabrication Shops

All third party quality control and assurance inspectors will provide inspection services ranging from, but not limited to, individual piping or equipment fabrication to major unit expansions and revamps. Mosaic inspectors will ensure compliance to applicable

specifications and codes utilizing sound engineering and inspection practices. Our third party inspectors will work in conjunction with the vendors and fabricators to maintain continuity and scheduled completion. Inspectors are required to review job specifications, drawings, material data reports, welder qualifications, and procedures. During fabrication and erection, inspectors may verify materials, dimensional layout, weld alignments, welding, and radiographic review.

4.5.1 Vendor Inspection Process

Upon receipt of a purchase order, the Inspector will obtain pertinent drawings and specifications. After review of all relevant documentation, a quality plan will be formulated by Mosaic which outlines the technical considerations and criteria for inspection. The quality plan will address primarily:

- Materials of Construction
- Welding
- Nondestructive Examinations
- Heat Treating
- Parts and Assembly Inspection
- Protective Coating
- Construction and Dimensions
- Documentation
- Marking and Tagging
- Packing

4.5.2 Vendor Inspections and Hold Points

The duties of the Owner-User API Inspector are to assure that we are obtaining a quality product from our vendors. The following is the recommended list of inspections and hold points to establish:

- Applicable codes
- Check for valid Certificate of Authorization (registered pressure vessels)
- Manufacturer has an adequate Quality Control System and hold points established
- Design calculations and approved drawings
- All materials comply with Code specifications, Mosaic Standards, and Purchase Orders
- Only qualified welding procedures/welders are used
- Required heat treatment has been performed
- That all required N.D.E. have been satisfactorily performed with acceptable results

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- Check vessel for dimensional tolerances, nozzle sizes and location, proper support position, completed welding, and general appearance
- Check for proper stamping and attachment of nameplate
- Make final internal and external inspection for Code compliance
- Witness Hydrostatic Test
- Sign off the Certificate of Inspection as required by the applicable Code when satisfied that the asset is properly documented and constructed

The repair organization is responsible for all modifications, alterations and/or repairs associated with the project and shall be responsible for performing and/or sub-contracting all code required inspections, hereafter referred to as Quality Control (QC) inspections. This includes but is not limited to:

- Radiography, Ultrasound, Magnetic Particle, Liquid Dye Penetrant, Vacuum Box Leak Testing, Elevation Surveys, Pneumatic Leak Tests, Hydrostatic Leak Tests, Destructive Tests (Tensile Pulls-Bends), Hardness/Charpy V-Notch, or any testing required by the governing code specification or Mosaic mandated inspection standard
- Material Control, Equipment Calibration Control (including NDT or DT Instruments)
- Visual Inspections
- Written Inspection Reports and Material or Mill Test Reports (MTR's)

All inspection organizations' NDT written procedures and personnel certifications shall comply with the governing code specified by Mosaic. These procedures and certifications will be made available to Mosaic Authorized Inspectors at any time during shop or field fabrication/erection operations.

4.6 Review Checklist

- A Turnaround Specific Inspection Plan should be developed.
- All the turnaround inspection requirements should be established during the planning phase.
- Proper inspections should be performed at the large vendors and fabrication shops to ensure quality control and minimize field rework.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-J03 INSPECTIONS DURING EXECUTION PHASE

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Inspection During Execution Phase

The Turnaround Management Team should identify key individuals within various departments for inspection and coordination and ensure their participation during the execution phase. This will ensure that turnaround execution is in total compliance with the company's Quality Control and Inspection Guidelines and Procedures:

- Participate in daily update meeting with Turnaround Manager.
- Follow the inspection schedule and be prepared in a timely manor to perform the assigned inspections.
- Update turnaround planning on inspection status of all jobs in progress.
- Prepare timely work requests concerning repairs and replacements to equipment based on inspection findings.
- Write a Post-turnaround Inspection Report Summary
- Inspection Plan and Priorities

4.2 Inspection Plan and Priorities

External Visual, Internal Visual, and UT Thickness examination frequencies shall be determined in accordance with API 510, API 570, API 653, or NBIC as applicable. Inspection(s) will consist of the following:

- Check for leakage
- Pinpoint corrosion areas for UT inspection

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- Check vessel supports
- Overall appearance and condition of nozzles, connections, etc.
- Check for mechanical damage or distortion

4.3 Inspectors Certification and Responsibilities

The API 510, 653 or 570 Authorized Inspector, having successfully passed the API examination and holding a current API Certification, is responsible for developing the inspection plan, performing external inspections, internal inspection, reviewing the repair plan, establishing inspection frequency intervals, Quality Control, fitness for service, and writing the final report.

A documented Quality Program shall be established, implemented, and maintained by the Inspection Contractor. This program shall be documented by written policies, procedures, or instructions. The program shall provide for indoctrination and training of personnel performing such activities, as necessary, to assure that suitable proficiency is achieved and maintained.

4.4 Review Checklist

- Inspection priorities should be developed to streamline inspection during the Field Execution Phase.
- Company and contractors' inspectors should work closely and follow the inspection guidelines and procedures.
- Inspection should develop a Post-Turnaround Inspection Report within 2 weeks of the turnaround.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-J04 QUALITY CONTROLS AND QUALITY ASSURANCE

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Quality Control and Quality Assurance

The purpose of this section is to ensure that the turnaround work scope is performed to the highest quality in order to achieve desired mechanical integrity performance. This will ensure that the facilities will operate reliably through the next scheduled turnaround. Some of the key components of a good Quality Control and Quality Assurance Program are:

- Provide routine inspections to monitor the quality of work during turnarounds
- Establish a checklist for pre-turnaround, turnaround, and post-turnarounds inspection and quality performance requirements
- Inspect the equipment and verify the work performed to ensure mechanical integrity
- Develop a rework evaluation system for quantifying all turnaround rework

Inspectors should work closely with the Turnaround Management Team in order to define inspections and quality control requirements for all the work scope associated with the pre-turnaround, turnaround and post-turnaround phases.

4.2 Quality Control Procedures

Written quality control procedures that track critical equipment during the fabrication stage should be established and implemented to ensure that materials and construction are in accordance with design specifications. This procedure is needed to help ensure that proper materials of construction are used, that fabrication and inspection procedures

are in place, and that installation procedures recognize field installation concerns. These procedures will come from the inspection department from established codes and standards, such as Engineering Guides, the American Society of Mechanical Engineers, the American Petroleum Institute, the American Institute of Chemical Engineers, the American National Standards Institute, the American Society of Testing and Materials, and the National Fire Protection Association.

4.3 Quality during Commissioning and Start-ups

The purpose of this section is to ensure safe unit startup without any leaks and to ensure reliable operations. The implementation of this section involves developing checklists that will be reviewed and signed off by the appropriate personnel prior to the final approval and startup of any equipment, process system or unit. Pre-commissioning acceptance is a review of the work by all Mechanical, Production, Inspection, and Turnaround organizations to ensure all necessary activities have been completed prior to startup of any system or unit.

- Ensure that pre-commissioning checklists have been completed prior to any unit or system startup.
- Ensure that pre-commissioning forms are completed and submitted to Production, Engineering and Inspection for approval.

In order to ensure safe start-up of the facilities, the following checklists should be used. These checklists identify the things which should be checked for completion prior to start-up along with the responsible positions or departments.

- Tank Closure
- Vessel Closure
- Rotating Equipment Completion
- Heat Exchanger Cleanliness and Inspection
- Blind Installation and Removal
- Production Pre-Startup Checklist
- Production Startup Checklist

Note: The above list of required pre-commissioning and startup checklists is not all inclusive to any given turnaround.

4.4 Review Checklist

- Mosaic's Inspection Departments establishes the Quality Controls and Quality Assurance requirements for all vendors and contractors.
- Periodic inspection checks are made at vendor shops to ensure compliance to company's quality control requirements.
- Contractors are responsible to ensure compliance to Mosaic's Quality Control requirements.

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5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-J05 COMPANY STANDARDS, SPECS AND PROCEDURES

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Company Standard, Specs and Procedures

The Engineering and Maintenance Webpage will provide leadership for the revision, creation and storage of Maintenance and Engineering standards, drawings and documents. It will also provide access to standards, documents, and reports for all phosphates employees.

4.2 Locating Mosaic's Standards

All standards, documents, and many engineering drawings are stored on the Engineering and Maintenance Website. Before any inspection begins, always check the M&E website to review inspection requirements for specific assets:

- Location of the Engineering and Maintenance Website is stored under "Departments' on the Mosaic Home page.
- Legacy IMC and Cargill standards are stored under the folder entitled "Legacy Cargill" and Legacy IMC" under Equipment Standards.

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4.3 Review Checklist

- Mosaic should provide upfront all the company standards, specifications and procedures to all vendors and contractors.
- It is the joint responsibility of Mosaic and contractors/vendors to ensure total compliance to company standards, specifications and procedures.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-K01 BUDGET DEVELOPMENT AND COST MANAGEMENT

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Budget Development and Cost Management

Completion of a turnaround within the established budget is one of the principal performance objectives. To ensure within the budget performance, Mosaic's Turnaround Management Team should be staffed with qualified cost control staff. The cost control function should be established from the earliest planning phases to accomplish the following budget development and cost related activities:

- Establish a turnaround budget
- Develop realistic cost estimate of the defined work scope
- Set up cost control system for the turnaround
- Develop contingency cost estimates for the potential add-ons and work scope growth
- Establish cost control reporting and monitoring mechanism from contractors, subcontractors, vendors, etc.
- Create a cost consciousness environment with the company
- Establish a mechanism to track and approve any work scope changes or add-ons

4.2 Turnaround Budget Development

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The cost performance of a turnaround is judged by the overall final cost as compared to the approved turnaround budget. Developing an accurate and realistic turnaround budget is one of the key responsibilities of the Turnaround Management Team.

The Turnaround Management Team should follow Mosaic's budget development process to ensure that turnaround budget is not only developed in a timely fashion but also meets the budgetary guidelines. To develop realistic and achievable turnaround budgets, it will be essential that input be sought from other company departments such as:

- Turnaround Planning
- Operations and Production
- Finance and Marketing
- Technical and Process
- Maintenance
- Inspection and Mechanical Integrity
- Safety, Health and Environment
- Capital Projects and Engineering, etc.

Participation from these key departments will ensure that their respective perspectives and priorities are recognized in the budget development process. The turnaround budgetary targets should create a balance between the company's business and financial expectations and the plant's mechanical integrity and operational reliability needs.

4.2.1 Expense Versus Capital

In developing the cost estimate and budget, the Turnaround Management Team should work closely with the accounting and finance groups to determine the proper classification of work orders into capital or expense categories. This classification is very important and has major significance in the company's financial accounting.

The cost control staff should ensure that actual costs are also charged to the appropriate cost accounts and classified as capital or expense. Depending upon the size of the turnaround, the tax and financial advantages will vary upon this cost classification.

4.2.2 Budget Cost Components

The turnaround budget should be broken down to show the following key cost components:

- Field labor cost
- Materials cost
- Construction equipment and tools cost
- Overhead and support facilities
- Contractors, subcontractors and vendors cost
- Contingency and management reserves

- Turnaround planning cost

4.2.3 Contingency Management

Turnaround estimates by definition and due to their unique nature contain a significant amount of uncertainty. Any provisions or allowances to cover for these uncertainties could escalate the cost budget. To ensure budgets can cover the inherent uncertainties of a turnaround, contingency funds should be included in good turnaround cost estimates and budgets. The amount of contingency for a turnaround is determined by the size and complexity of the turnaround, the turnaround work scope, the work environment and the estimating techniques.

Contingency is a certain percentage of cost added to the total turnaround cost to cover execution changes and estimate adjustments that historically occur during the planning and execution of a turnaround. This contingency is required to give the turnaround estimate an equal chance of overrun and/or under-run.

Contingency does not cover work scope and turnaround basis changes, budget transfers, extraordinary random events and abnormal economic conditions. Contingency is a provision for those variations to the estimate basis which are likely to occur but cannot be specifically identified at the time the budget estimate is prepared.

4.3 Budget Validation

Since turnaround budgets are developed 6-12 months before the turnaround, there are many potential changes that can occur which could effect the budget premise. Therefore, it is prudent to have an on-going mechanism to validate the budget and identify any significant changes. In addition, the quality of turnaround information keeps getting better over the time and it should be reflected in the budget.

The newly validated budget provides valuable feedback to Site Leadership Team and corporate management about the realistic outlook for turnaround costs. The Turnaround Management Team and the cost control staff play a key role in the budget validation process. Some of the key considerations and benefits of budget validation are:

- Budget outlook represents the latest turnaround work scope and needs
- Corporate financial plans and goals are reflected
- The budget reflects information from better turnaround estimates
- Contingencies are updated
- Helps in better capital versus expense allocation decisions
- Gives the Site Leadership Team the opportunity to adjust expenditure and cash flow priorities

4.4 Cost Management

The Turnaround Manager is responsible for the cost performance and completing the turnaround within an established budget. The Turnaround Management Team should be staffed by qualified cost control individuals to ensure that all the following key elements of a good cost management function are implemented on a turnaround:

- Cost Breakdown Structure

- Turnaround Cost Estimate
- Cost Control System
- Cost Control Performance Baselines
- Cost Commitment Tracking and Reporting
- Monitoring Contractors' Cost Performance
- Analyzing Cost Performance Trends
- Cost Forecasting
- Management of Scope Changes

The attached flow chart shows the Cost Management Function for a typical Turnaround.

4.5 Cost Estimate Development

The Turnaround Management Team is responsible for the development of cost estimates for all the approved turnaround work orders and associated support costs. A qualified cost control individual or resource should be assigned to the turnaround team to develop detailed cost estimate for each work order.

The Turnaround Management Team should develop an overall cost estimate for the turnaround 4-6 months before the turnaround, depending upon the size and complexity of the turnaround. The turnaround estimate should be broken down to show the following key cost components:

- Mosaic's Internal/Planning Costs
- Field Labor Cost
- Materials Cost
- Construction Equipment Cost
- Overhead and Support Facilities
- Cost by Contractors, Subcontractors, etc.
- Contingency for Typical Work Scope Growth

4.6 Cost Breakdown Structure

One of the key objectives of an effective cost management function is to establish cost consciousness and accountability throughout the turnaround organization. Cost Breakdown Structure is a management tool that breaks down the turnaround costs into logical work groups or activities and assigns accountability at departmental and/or individual levels.

Establishing a good Cost Breakdown Structure takes a lot of thinking and input from various participants. It is closely tied to the turnaround's Work Breakdown Structure and the Organization Breakdown Structure in order to establish a logical correlation.

For effective cost management, the Cost Breakdown Structure should be established during the Strategic Planning and Work Scope Phase. A simplified Cost Breakdown Structure is shown in Attachments.

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4.7 Cost Control, Analysis and Forecasting

The Turnaround Management Team is responsible for implementing proactive and dynamic cost control functions on a turnaround. The cost control system should be designed to not only track cost commitments but also provide data to analyze cost performance to date and forecast cost at turnaround completion. Some of the key components of a good cost control function are:

- Develop cost commitments and expenditure curves
- Establish cost performance baseline and accountabilities
- Analyze cost information to ascertain performance trends
- Recognize deviations from the cost baseline
- Monitor contractor's cost performance
- Identify opportunities to improve cost performance
- Forecast turnaround cost based on performance

4.8 Management of Changes

After the last work scope is finalized, any changes to the approved work scope and the cost baseline must be reviewed and approved prior to their inclusion in the turnaround plans. In order to ensure effectiveness and viability of the turnaround planning and cost control functions, it is mandatory that all the participants should follow Mosaic's procedures to manage turnaround changes.

Section C05 of this manual shows Mosaic's procedures for managing changes. In this section, the emphasis is to define the cost of changes, in order to facilitate decision-making for inclusion in the turnaround work scope. The turnaround planner and the cost control professionals are responsible to identify the cost of each potential work scope change. The cost should be determined for following elements of a potential change and/or add-on:

- Field Labor and supervision
- Materials
- Equipment
- Overheads and miscellaneous

Depending upon the magnitude of the change, the above cost information is submitted to the Turnaround Manager and the Site Leadership Team for their approval. If the changes meet the inclusion criteria and get the approval, then these are included in the turnaround plans.

All changes to the turnaround base plans are documented and go through rigid justification and approval process. The approved changes are included in the turnaround schedules and cost control documents for execution

4.9 Contractors' Cost Responsibility

The contractors should be responsible to track their committed/expended costs and report them to Mosaic's Turnaround Management Team. Mosaic's cost control staff

should establish the cost control and reporting requirements from the contractors, subcontractors and vendors.

Mosaic should fully evaluate the contractors' cost function capabilities in order to establish realistic expectations. In case the small contractors are not sophisticated enough to perform a good cost control function, then Mosaic's turnaround cost control staff should support them with company's cost control system.

The contractors are required to provide Mosaic with the following cost information on a daily basis:

- Expended work hours per shift
- Labor cost expended per shift
- Cost for rental equipment and materials
- Overheads cost
- Field management/supervision cost
- Deviations and changes from the base/contracted control cost estimate

4.10 Review Checklist

- Initiate the cost control function from the earliest planning phase.
- Assign qualified cost control staff to the turnaround team.
- Contractors should be responsible to track and report their cost on a daily basis.
- All approved work orders should be scoped in order to develop individual estimates.
- Change Management System should be established and strictly followed.

5.0 REFERENCES

- Turnaround Management Procedures Manual

6.0 ATTACHMENTS

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TMPP-K02 PROGRESS REPORTING AND FORECASTING

PROGRESS REPORTING AND FORECASTING

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TMPP-K03 CONTRACTOR MANAGEMENT

1.0 PURPOSE

The purpose of these Turnaround Management Process Procedures is to describe in detail the contents and implementation steps of Mosaic's Turnaround Management Process. In addition, this procedures manual includes examples, reference documents and forms that can be readily customized and used for any turnaround.

2.0 RESPONSIBILITY

The Plant Manager and Turnaround Management Team are responsible for the implementation of these procedures. All the affected Mosaic departments and contractors must understand and support these procedures and ensure its total and timely compliance.

3.0 COMMUNICATION

Mosaic's Turnaround Advisor and the Turnaround Excellence Champions at each plant play a pivotal role in keeping these procedures current and communicating to all turnaround participants. They also ensure that all new turnaround staff and participants are provided training so that they fully understand the contents and follow these procedures.

4.0 PROCEDURE

4.1 Contractor Management

Effective Contractor Management is essential to achieve highest contractor performance and ensure successful execution of plant turnarounds. The Mosaic's Turnaround Management Team must institute meaningful management controls that help to monitor the performance of turnaround contractors. Since the construction effort is always on the critical path, any delays or slippages in construction would adversely impact the turnaround completion date.

Effective Contractor Management controls should be established in order to identify any deviations from the contractual baseline. Similarly, contractors should be required to implement planning and cost control techniques that provide early warning signals if the field execution is falling behind the established performance baseline.

Without the implementation of effective contractor management controls, the turnarounds tend to suffer from:

- Poorly defined work scope
- Constant changes and additions of work scope
- Poor progress reporting
- Ineffective coordination between contractors

All of the above are early symptoms of poor project performance.

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4.1.1 Contractual Control Requirements

The Mosaic Turnaround Team Management should provide guidelines that the contractors should follow when implementing meaningful project controls on plant turnarounds. To ensure their effective implementation, these guidelines should be incorporated in the contractual documents. The management control guidelines should be clearly communicated to the contractors prior to start of the Execution Phase. Typical parameters to monitor a construction contractor's performance are:

- Safety
- Schedule Compliance
- Cost Tracking
- Manpower Plans
- Progress Measurement
- Productivity
- Quality Control

4.2 Contractor Coordination Procedures

Mosaic's Turnaround Management Team with the support of the purchasing department should develop Contractors Coordination Procedure to avoid any conflicts with the contractual terms and then monitor performance. Coordination procedures should be specific to each contractor and must clearly show the following:

- Organizational interfaces
- Authorization process/level
- Performance expectations
- Communication channels and format
- Reporting formats and frequency
- Procedures for managing scope changes

In addition, any specific instructions to improve working relationships and performance should be listed in these coordination procedures.

4.2.1 Contractor Information

The Turnaround Management Team should keep a contractor information sheet with the current information on each contractor working on the turnaround. A Contractor Information Sheet must be developed for all contractors, subcontractors, vendors, etc. These should be updated periodically to keep the information current and useful.

A sample Contractor Information Sheet is shown in the Attachments.

4.3 Contractors' Organization and Staffing Plan

Each contractor is required to provide Mosaic with the following organizational charts:

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1. Turnaround Planning and Execution Organization Charts
2. Company's Corporate Organization Chart

The Turnaround Management Team, in consultation with the contractor, should identify the contractor's turnaround staff requirements and organization chart.

The contractor's organization chart must be approved by the Mosaic's Turnaround Management Team.

4.4 Daily Manpower Reporting

The turnaround contractors are required to report, on a daily basis, the actual number of field crafts that have reported at the jobsite, same is true for the support staff and supervision working on a Mosaic turnaround. The contractor provides a comparison of actual versus the planned manpower. For effective control, the construction contractor's manpower should be broken down by:

- Field Crafts
- Field Supervision
- Support Staff

In addition, the field crafts should be broken down by their area of specialty, such as:

- Piping welders
- Boilermakers
- Electricians
- Insulators,
- etc.

The contractors are required to explain any deviations if the actual manpower is different from the base manpower plans.

4.5 Contractor Progress Reporting

The success of a turnaround project depends, to a great extent, on the effectiveness and accuracy of the methods used to measure and report contractor's field progress. Without a meaningful progress reporting system, management can be left guessing about the real status of the construction program.

The progress reporting criteria and mechanism should be finalized with the contractors before the start of the field construction. Progress reporting should be based on actual quantities installed, and the actual status should be compared with the control baseline. The progress status of various categories of construction work, such as civil, piping, etc., then can be summarized, or "rolled-up" into an overall reporting denominator, *e.g.*, man hours.

The Mosaic's Turnaround Management Team should ensure that the construction contractor's progress reporting system meets the following criteria:

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- Based on installed quantities
- Independent of expended man hours
- Supports the project Work Breakdown Structure
- Emphasizes analysis vs. merely reporting
- Easy to understand for decision-making

4.6 Contractor's Performance Evaluation

The Turnaround Management Team and other appropriate departments, e.g. purchasing/contracting, should periodically evaluate the performance of turnaround contractors and subcontractors. If the contractor is selected early and involved in the pre-turnaround planning and execution phases, then the evaluation should be done every 1-2 months/or as deemed appropriate.

The principal purpose of the contractor evaluation is to get their management's attention to correct any weak areas of performance. The contractor should be expected to respond within a week about their plan of actions to remedy these areas and make changes to the satisfaction of the Mosaic's Turnaround Management Team. A final performance evaluation of all contractors should be made at the end of the turnaround. This will help to achieve the following objectives:

1. Recognize contractors for exceptional performance.
2. Identify any weak contractors which should not be considered for future turnarounds.
3. Make any adjustments to final contractor payments to reflect any adverse performance per the contractual arrangements.
4. Provide feed-back to contractors about the company's expectations on future turnarounds.

Mosaic should also get constructive feed-back from the contractors as to what adjustments Mosaic should make to improve the company's contracting practices and coordination with contractors. The attached Contractor's Performance Appraisal form shows the format for contractor evaluation.

4.7 Review Checklist

- Establish progress measurement and reporting guidelines before the Execution Phase.
- Establish and approve Contractor's organization charts and manpower plans.
- Establish coordination procedures to effectively manage and coordinate work of all turnaround contractors.
- Conduct periodic Performance Evaluations/Appraisals of all contractors and subcontractors.

5.0 REFERENCES

- Turnaround Management Procedures Manual

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6.0 ATTACHMENTS

- Contractor' Information Sheet

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Contractor Information Sheet

Contractor: Pressure Water Blasters Inc.

Contract No.: SD-9999-11

Contractor Site Representative: John Smith

Company's Site Representative: Joe Doe

Company's Contract Administrator: Joe Smith

EXAMPLE

General:

Scope:	High Pressure Water Service
Schedule:	January 25 to January 1, 1992
Address:	P. O. Box 1000 Houston, Texas 77777 Phone: (713) 555-1212 Fax: (713) 555-1213

Particulars:

Trade:	Operators (non-union)
Hours of Work:	As required
Rates:	Base rates based on 8 hours. Overtime – any hours in excess of 8 hours, holidays and weekends.
Supervision:	General foreman included in overhead.
Equipment:	Hourly rates for all high pressure units, bundle cleaner, spin jet floor cleaner, injection system, tank cleaning system, and steam cleaner. Standby at 50% of the straight time equipment rates.
Material/Supplies:	Cost plus 10% administrative charge.
Mob/Demob:	Fixed rate for men and equipment from Houston.
Other:	Safety training is reimbursable. Company pays for craft certification tests. ***Per diem for supervisor depending upon location***

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TMPP-K04 PRODUCTIVITY TRACKING AND IMPROVEMENT

PRODUCTIVITY TRACKING AND IMPROVEMENT

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TMPP-K05 ADMINISTRATIVE PROCEDURES AND CONTROLS

ADMINISTRATIVE PROCEDURES AND CONTROLS

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TMPP-L01 TEAM BUILDING AND ALIGNMENT

TEAM BUILDING AND ALIGNMENT

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TMPP-L02 TRAINING AND SKILLS DEVELOPMENT

TRAINING AND SKILLS DEVELOPMENT

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TMPP-M01 COMMUNICATION PLAN

COMMUNICATION PLAN

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TMPP-M02 TURNAROUND MEETINGS AND REPORTING

TURNAROUND MEEETINGS AND REPORTS

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TMPP-M03 TURNAROUND DOCUMENT MANAGEMENT

TURNAROUND DOCUMENT MANAGEMENT

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MISCELLANEOUS

IN DEVELOPMENT

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Turnaround Management Process

	1 Business and Conceptual Development	2 Strategic Planning & Work Scope	3 Detailed Planning	4 Pre Turnaround	5 Execution	6 Post Turnaround & Evaluation
Objectives	Establish Turnaround Basis Outlining TAR Purpose, Performance Expectations, Business Outlook, & Project Interfaces.	Establish Turnaround Goals, Identify Risks, Finalize Work Scope, Develop Contracting Strategy & Success Initiatives.	Finalize Execution Plans, Control Budget, Field Logistics, Operations Shutdown & Start-Up Plans.	Mobilize Resources, Indoctrinate Execution Staff, Stage Materials, Implement Logistics For Field Execution.	Safely Shutdown & Clear Facilities, Inspect, Complete Work Scope, Start-up & Produce On-spec Products.	Demobilize Contractors, Complete Documentation, Evaluate Performance & Lessons Learned.
Principal Focus	▶ Marketing Plans and Business Forecast ▶ Supply Projections of Raw Materials ▶ Operation Reliability and Performance ▶ Mechanical Integrity Performance Assessment ▶ Regulatory Compliance and Permit Application ▶ Capital Program Interfaces	▶ Participation of all Stakeholders ▶ Alignment of Business and Turnaround Goals ▶ Work Scope Development ▶ Integration with Capital Projects ▶ Potential Risks, Weak Areas and Their Mitigation Plans ▶ Strategies and Initiatives for a Successful Turnaround	▶ Selection of Contractors ▶ Detailed Plans for Work Scope ▶ Procurement of Materials ▶ Scheduling and Budgeting ▶ Shutdown and Start-Up Planning ▶ Performance Tracking Controls	▶ Logistics Plan for Efficient Execution ▶ Mobilization of Company and Contractor Resources ▶ Staging of Materials, Equipment, Tools, Etc. ▶ Pre –Fabrication, Scaffolding and Support Services ▶ Temporary Facilities, Utilities, Transportation, Etc. ▶ Orientation & Team Alignment	▶ Safety and Environmental Compliance ▶ Shutdown and Clear Facilities ▶ Efficient Field Execution ▶ Timely Issuance of Safe Work Permits ▶ Cost, Progress Tracking, Reporting and Forecasting ▶ Commissioning, Start-Up and On-Spec Production	▶ Post Turnaround Activities e.g. Scaffolding ▶ Clean-up of Facilities ▶ Demobilization of Contractors ▶ Disposal of Materials, Equipment , Etc. ▶ Equipment History Records ▶ Lessons Learned and Recommendation
Deliverables	▶ Turnaround Basis ▶ 5-Year Turnaround Cycle ▶ Business Impact Assessment ▶ Turnaround Milestone Schedule ▶ Regulatory Compliance and Permit Applications ▶ Capital Program Interface	▶ Turnaround Goals and KPI's ▶ Turnaround Execution Strategy ▶ Approved Work Scope ▶ Contracting Strategy and Plan ▶ Target Schedule and Cost Estimate +/-25% ▶ Plan to Plan The Turnaround	▶ Integrated Schedules & Critical Path ▶ Selected Contractors, Subcontractors and Repair Shops ▶ Logistics Plan ▶ Control budget +/-10% ▶ Shut-Down and Start-Up Plans	▶ Resources and Logistics in Place for Efficient Turnaround ▶ Trained Execution Teams and Staff ▶ Mobilized Contractors and Support Services ▶ All Materials Kitted and Staged ▶ Safety Permits and LOTO Systems are Finalized	▶ Completed Turnaround Work Scope ▶ PSSR Documentation ▶ Facilities Started up and Ready for On-spec Production ▶ Inspection Reports and Equipment History ▶ Clean and Safe Facilities	▶ Cleaned Turnaround and Lay-Down Areas ▶ Lessons Learned and Recommendation ▶ Work List for Next Turnaround ▶ Documentation of Completed Work ▶ Financial Close-Out Report ▶ Turnaround Close-Out Report
Decision Milestones	MC Approve the Turnaround Basis and Proceed with Strategic Planning and Work Scope Phase.	MC Approve Turnaround Work Scope, Support Execution Strategy and Proceed With Detailed Planning Phase.	MC Approve Execution Plans, Control Budget, Proceed With Pre-Turnaround Phase and Mobilize Resources..	MC Accept Completed Pre Turnaround Activities and Proceed With the Execution Phase and Start Unit Shutdown.	MC Accept the Operating Facilities and Proceed With Post-turnaround and Evaluation Phase.	MC Approve the Plan To Implement Improvements Based on Lessons Learned, and Conduct Quarterly Reviews.
	7-12 Months Before the Turnaround	6-11 Months Before the Turnaround	2-9 Months Before the Turnaround	3-8 Weeks Before the Turnaround	Execution Phase Timing	2 - 8 Weeks After the Turnaround Completion

MC Management Closure

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