# MANAGEMENT SYSTEM MANUAL

**Total Cray Valley**
A Division of Total Refining and Petrochemicals
• 665 Stockton Dr, Suite 100 • Exton, PA 19341
Tel: 877-871-2729 • 877-US1-CRAY
• Fax: 610-363-1498 • Web: www.crayvalleyus.com

## TABLE OF CONTENTS

## 1 INTRODUCTION

Business Description

TOTAL CRAY VALLEY, a division of Total Petrochemicals & Refining USA, Inc. (henceforth referred to as “the company” or TCV) is a leading manufacturer of solid monomers, aliphatic/aromatic hydrocarbon resins, polybutadiene and functionalized polybutadiene resins, hydroxyl terminated polybutadiene resins and styrene maleic anhydride resins. The industries served by the company’s products include rubber, inks, coatings, adhesives, electronics, impact modifiers, etc.

TOTAL CRAY VALLEY, a division of Total Petrochemicals & Refining USA, Inc. was formed in 2014. Previously the company was known as Cray Valley USA, LLC and was formed in 2010 with the management team from the tackifier and functional additives businesses of Sartomer. The management of the company is committed to the principles of quality and continuous improvement.

The company Corporate Headquarters located in Exton, Pennsylvania includes Corporate Quality Assurance, Sales, Business Management, and Research & Development (synthesis group only) functions for all U.S. based production facilities.

The company produces solid monomers at its Stratford, Connecticut and Chatom, Alabama locations.

The company produces hydrocarbon resins at its Beaumont, Texas location.

The company produces hydroxyl terminated polybutadiene resins and styrene maleic anhydride copolymers at its Channelview, Texas location.

The company produces polybutadiene and functionalized polybutadiene resins at its Grand Junction, Colorado location.

The company Management System is described within this manual. ISO 9001 and RCMS registered sites are shown in Table 1 below. The current Cray Valley Responsible Care Management System (RCMS) Certification is aligned with Corporate Total RCMS Certification and is managed by TPRI HSSE in Houston, TX. The company was incorporated into the Total Refining & Petrochemicals RCMS certification at the end of 2016.

| Registered Site | ISO | RCMS |
| --- | --- | --- |
| Beaumont, TX - Manufacturing Site | ISO 9001 | |
| Channelview, TX - Manufacturing Site | ISO 9001 | Not RCMS |
| Chatom, AL - Manufacturing Site | ISO 9001 | RCMS 12/2015 |
| Grand Junction, CO - Manufacturing Site | ISO 9001 | RCMS 12/2014 |
| Stratford, CT - Manufacturing Site | ISO 9001 | RCMS 12/2014 |
| Exton, PA – Corporate Headquarters and Research and Development Labs | ISO 9001 | Not RCMS |

## 2 NORMATIVE REFERENCES

2.1 ISO 9000 - Management Systems-Fundamentals and Vocabulary
2.2 ISO 9001 - Management Systems-Requirements
2.3 Responsible Care Management System - Technical Specification

## 3 TERMS AND DEFINITIONS

3.1 ERP - Enterprise Resource Planning
3.2 Key Performance Indicators (KPI) - the company's Quality and EHS&S Objectives
3.3 ISO Management Contact – TCV Corporate Quality Manager
3.4 RCMS Management Representative – TPRI EHSS Group Representative
3.5 Top Management - TCV Executive Management Committee and designees, employed by TPRI (EMC)
3.6 TMS - Training and Document Management System
3.7 QMS – Quality Management System

## 4 Context of the Organization

4.1 Understanding the Organization and its context

The strategic direction of the TCV business has been determined by the EMC and is documented in the Long Term Plan (LTP). External and internal issues relevant to the strategic direction of the company have been identified through SWOT analysis techniques for each location and are monitored and reviewed periodically throughout the year based on site specific requirements. All locations review changes in internal and external issues as a part of Management Reviews.

4.2 Understanding the needs and expectations of Interested Parties

Interested parties that are relevant to the QMS have been determined through analysis of their importance to and influence on the QMS. Each location maintains a list of interested parties and their requirements. High influence/ high importance interested parties are monitored and reviewed periodically based on site specific requirements, in order to understand their needs and requirements. Feedback from interested parties is reviewed as a part of Management Review.

4.3 Determining the scope of the quality management system

The scope has been defined by the products and services of the organization, taking into consideration the requirements of our key interested parties and the external and internal issues referenced above.

Included within the scope of the company's Management System are:
For the Exton, PA facility, the ISO scope includes the design, development, sales, customer service, purchasing, and corporate management functions for the manufacturing of solid monomers, hydrocarbon resins, polybutadiene and functionalized polybutadiene resins, and out-sourced manufacturing of hydroxyl-terminated polybutadiene resins and styrene maleic anhydride resins.

The company sells specialty chemicals for customer use. Products are sold on specifications which apply directly to the product sold and can be verified by documented testing procedures performed directly on the product. The company makes no specifications or warranties on the performance of the product. It is up to customers to test products for their specific (and often

confidential proprietary) end application. The customer validates the products for their use. As a result, R&D applications group work is not included in the scope of ISO 9001: 2015. The R&D applications personnel are chartered with teaching customers about potential use of our products, evaluating potential new uses for product and developing first point information for new applications suggestions to customers, etc. In no case, however, does the company make any specifications concerning the application behavior or end performance of polymerized product. The company specifically avoids such specifications. The customer is responsible to test and validate use of the product for their intended application in their systems. The company's R&D applications group personnel are available as support for customers and as researchers to investigate potential new uses of the company's products. The group does not engage in the Design and Development of products and is therefore not included in the scope of ISO 9001: 2015.

Customer Service, Domestic and International, Logistics, and Purchasing are outsourced through Total Refining & Petrochemicals USA, Inc. (TPRI). Processes and procedures to ensure compliance with the ISO standard and controls are defined throughout this manual and in referenced documents, as applicable.

For the Grand Junction, CO site, the ISO scope includes the manufacturing of polybutadiene and functionalized polybutadiene resins.

For the Stratford, CT site, the ISO scope includes the manufacturing of solid monomers and including warehousing at the 550 Long Beach Blvd warehouse.

For the Chatom, AL site, the ISO scope includes the manufacturing of solid monomers and including warehousing at the 15108 St. Stephens Avenue warehouse.

For the Beaumont, TX site, the ISO scope includes the manufacturing of hydrocarbon resins.

For the Channelview, Texas operation, the ISO scope includes engineering, quality control laboratory, purchasing and management for the manufacture of hydroxyl-terminated polybutadiene resins and styrene maleic anhydride resins through outsourced operations, maintenance, scheduling and warehouse processes.

A third party Registrar independently assesses that the requirements of the applicable standards are satisfied within the company's Management System.

The Management System ensures the effective operation and control of our business processes. The Management System is process-based to ensure customer requirements are understood throughout the organization and met through value added activities that result in and enhance customer satisfaction. The company has recognized the value and synergy that comes about with compatible management systems. Therefore, the Responsible Care Management System (RCMS) follows a similar structure to the Quality System. The company clearly recognizes that in meeting and enhancing customer requirements it must meet and continually improve its responsibilities to quality, health, safety, security and our environment. The following locations have EHSS Management systems to meet the requirements of the RCMS Technical specifications: Beaumont, TX; Grand Junction, CO; Chatom, AL; Stratford, CT. The Channelview, TX location is exempt from RCMS as they are under the Lyondell

Basell EHSS programs. The Exton, PA location is not a manufacturing facility and RCMS is limited to the R&D Laboratory safety program and the control of Toll Manufacturing.

### 4.4 Quality/ RCMS Management System and its Processes

The company Management System is maintained and continually improved in accordance with the requirements of this Management System Manual, ISO 9001, and the RCMS Technical Specification. The company Management System consists of a series of inter-related processes applied across the organization that ensure customer requirements are met with the aim of enhancing customer satisfaction. Criteria and methods have been identified to make certain that these processes are and remain effective with a goal to improve the processes and the QMS.

Process diagrams have been established and maintained at Corporate and plant locations. The Corporate Process Diagram document (CR-QA-LI-0001) resides in TMS and includes basic process inputs and outputs and a basic flow chart of the sequence and interactions of the processes. Monitoring and measuring of the processes and related performance indicators may be referenced in the process diagrams, however, the data is maintained in separate records.

Resource needs for the process have been determined and Management insures that the appropriate resources are available to maintain the processes.

Detailed responsibilities and specific authorities for the processes and related activities are contained within the controlled procedures and work instruction for operating the processes. Training on these documents ensures that affected personnel clearly understand their responsibilities and authorities.

Process risks have been addressed in the process diagrams as well as Process Hazard Analysis (PHA), where applicable. Opportunities may be captured in a variety of documented information, such as CapEx, Process Trials, Management of Change, etc. Other process and system risks and opportunities are documented in the SWOT analysis mentioned in 4.1. Risks and Opportunities are evaluated on a case-by-case basis to determine any actions needed, in accordance with the requirements of section 6.1.

These processes are reviewed and evaluated as a part of Management Review to ensure that the processes achieve their intended results and identify any need for changes. Any process changes are implemented in a controlled manner.

Documented information to support the operation of the processes is maintained in TMS. Records and other documented information are retained in accordance with the site specific procedures to demonstrate confidence that the processes are being carried out as planned.

## 5 Leadership

### 5.1 Leadership and Commitment

The company's Management demonstrates leadership and commitment to quality and environmental health, safety and security management systems through participation and support of the business processes implemented as part of the requirements of ISO 9001 and the RCMS technical specifications. The Executive Management Committee has appointed

the Corporate Quality Manager to oversee the QMS. The Quality Manager is responsible for leading the evaluation of the Management System effectiveness during the Corporate Management Review. The Executive Management Committee (EMC) actively participates in Management Review and is accountable for the effectiveness of the QMS. The EMC provides resources and support to ensure that the Management System processes implemented remain effective and are reviewed for improvement.

The HSSEQ Charter, the Operating Philosophy, and the Key Performance Indicators (KPI) are established and are compatible with the context and strategic direction of the organization. Management demonstrates leadership by measuring and communicating organizational performance through the use of the company KPIs.

The Quality and the Environmental, Health, Safety and Security Management Systems are integrated into the business processes. The EMC promotes the use of the process approach and risk-based thinking.

The importance of effective management system processes and of conforming to the management system requirements is communicated throughout the organization via various means, such as: the HSSEQ charter, the Operating Philosophy, QMS awareness, RCMS Awareness, Business reviews, etc. The EMC is committed to ensuring that the QMS achieves its intended results. This is achieved through engaging, directing and supporting persons who contribute to the effectiveness of the QMS and promoting improvement. The EMC demonstrates leadership by supporting other management roles in their areas of responsibility.

Customer Focus

The Company's Executive Management Committee is committed to meeting our customers' requirements and enhancing our customers' satisfaction. This commitment is realized by the establishment of processes that clearly determine our customer's needs and expectations then translating them into product that fulfill requirements. These processes include awareness and training for the company personnel on the importance of fulfilling customer, statutory and regulatory requirements and expectations. Careful analysis of these processes including risks and opportunities, their subsequent outputs, and multiple feedback systems provide the foundation for their continual improvement to enhance customer satisfaction.

## 5.2 Policy

Safety Health Environment Quality Charter and the Operating Philosophy.

Total's Refining & Petrochemicals Americas Management has established the Health Safety Security Environment Quality Charter. In addition, the Total Cray Valley Management has established the Operating Philosophy, in TMS. The Executive Management Committee ensures that the HSSEQ Charter and the Operating Philosophy are communicated and understood by all company personnel and that the policy is implemented throughout the company. The policy is reviewed for continuing suitability at least annually during the Corporate Management Review. These documents are available to all interested parties on the Cray Valley website. The documents are controlled and communicated through the use of our document control system and QMS Awareness training.

5.3 Organizational roles, responsibilities and authorities
The EMC is responsible for defining roles, responsibilities and authorities as it pertains to the Management Systems and assigning to the appropriate functions, departments, teams and/or individual personnel within their control.

The authorities and responsibilities for the company Management System are clearly defined and well communicated within the organization. Overall responsibility and reporting functions are documented in the company's organizational charts. These organizational charts are located on WAT/My Entity/Organization Charts/Total Cray Valley Organizational Relationships. Detailed responsibilities and specific authorities are contained within the controlled documentation for the Management System. Training on these documents ensures that affected personnel clearly understand these responsibilities and authorities. Changes in responsibilities and/or authorities are communicated in a timely manner to all company personnel as appropriate. This allows any changes that may affect the Management System to be handled in a planned, controlled manner such that its integrity is not compromised.

The company personnel who manage, perform and/or verify work are responsible for the quality of the work. All personnel are authorized to identify and record problems relating to products and processes including Environmental, Health, Safety, and Security issues as well as Quality issues. All personnel have the responsibility to assure that processes are in a state of control and that the tasks are completed in a responsible manner. All personnel are also responsible for identifying nonconforming product, segregating such product as being nonconforming, notifying management, and controlling further processing until the problem has been corrected. To prevent nonconformities, they may also initiate, recommend, or provide solutions through designated channels, such as the Corrective Action systems.

Quality Manager
The Quality Manager coordinates the Management Review of the Management System at the corporate level and ensures that they are performed at the Site level. The Executive Management Committee has appointed the Corporate Quality Manager to oversee the QMS with the authority and responsibility to ensure that processes needed for the Management System are established, implemented, maintained and continually improved across the organization. The Quality Manager is responsible for evaluating the effectiveness of the Management System organizational wide and reports on its effectiveness and improvements to the EMC during the Corporate Management Review. Also, the Quality Manager is responsible for the promotion of awareness of customer requirements throughout the organization and acts as a corporate liaison with external parties on matters relating to the QMS.

Site ISO Management Representative
Site ISO Coordinators assist the Corporate Quality Manager in executing these duties at each of the ISO 9001 registered Manufacturing Sites. The Site ISO Coordinators are responsible for coordinating the Quality Assurance activities at their respective manufacturing Sites. These individuals, irrespective of other duties, have the authority and responsibility to ensure that the requirements of the Management System are established and implemented at their respective locations. The Site ISO Coordinators are responsible for evaluating the effectiveness of the Management System processes at their respective

locations and reporting on it to the Site Management during the Site Management Reviews. The Site ISO Coordinator is responsible for reporting the results of the Site Management Review Meetings to the Corporate Quality Manager who will communicate the results to the Executive Management Committee. Any issues or concerns will be reviewed at the EMC meetings as needed. The Site ISO Coordinator is responsible for the promotion of awareness of customer requirements throughout their respective Site and acts as the Site liaison with external parties on matters relating to the Management System. In the absence of the Site ISO Coordinator, the Corporate Quality Manager will assume these responsibilities until a new site coordinator is assigned.

Responsible Care (RCMS) Coordinator

The Responsible Care Coordinator (TPRI HSSE Assurance Group/Management Systems Coordinator) serves as the corporate representative within the company for the Responsible Care Management System implementation activities as well as the liaison between the American Chemistry Council and the company. The Responsible Care Coordinator has the responsibility and accountability for the overall RCMS implementation and certification plan, implementation of Responsible Care code requirements (i.e. product safety, process safety, security, etc.), reporting Responsible Care performance data and other RCMS related requirements. Each manufacturing facility has appointed a site representative to work with the TPRI Assurance Group to comply with all Responsible Care and RCMS requirements.

## 6 Planning

### 6.1 Actions to address risks and opportunities

The company has implemented various systems for identifying and evaluating risks and opportunities. SWOT analysis identifies business opportunities and risks. Process risks have been evaluated as part of the development of the process diagrams for the QMS processes. Opportunities to improve processes are identified as a part of CapEx planning, and may be identified as part of MOC, or in association with corrective actions. In addition, health, safety, security and environmental hazards and prioritization of risks with new and existing products and processes, as well as changes to existing products and processes are part of various EH&S processes. These systems include the distribution, transportation and use of raw materials and products, and activities associated with the company's operations.

Hazards and risks for new products are assessed in accordance with the *Risk Assessment Procedure, CR-PD-PR-0011* in coordination with the TPRI EHSS Group procedures that can be found on WAT under Product Stewardship. In addition, each manufacturing site has process trial procedures in place that also include risk assessment.

Existing products hazards and risks have been assessed by TPRI Product Safety in accordance with the requirements of the product safety code of Responsible Care. As a part of this system, product distribution, employee health and safety, environmental, security, and community risks are also evaluated. TPRI Product Safety Group risk procedure can be found on WAT.

Process hazards and risks are evaluated as a part of the Process Safety Management protocol for performing process hazard analysis and as a part of the management of change process. Each manufacturing facility has procedures in place to identify and prioritized

hazards and risks associated with their processes. In addition, process diagrams have been developed listing risks for QMS processes.
The evaluation of risks associated with the use and distribution of raw materials is performed by the TPRI EHSS Group and is incorporated into the company's Purchasing procedure for assessing suppliers of new raw materials or alternate suppliers for existing raw materials, CR-PU-PR-0034 *Material/Supplier Approval.*

Not all risks and opportunities require action. Those risks with a high impact or opportunities beneficial to the business will be addressed based upon the evaluation of the identified risk or opportunity and the level of impact or benefit determined. Actions to address risks and opportunities may be documented in various formats and systems, based upon the process used to identify the risk or opportunity (ie SWOT, Management Review, MOC, Corrective Actions, PHA, incident investigations, product development process, process trials, etc.).

6.2 Management Objectives (Key Performance Indicators) and planning to achieve them.
Management System planning is a hierarchical process that starts with commitment by the company's Executive Management Committee to our stakeholders as expressed in the Safety Health Environment Quality Charter and Operating Philosophy. Developed to support these policies are the risk based indicators that provide measurable objectives for organizational performance and continual improvement. The EMC is responsible for developing the highest level Objectives for the organization. These are known as Key Performance Indicators (KPI). The KPI are aligned with and support the Safety Health Environment Quality Charter and the Operating Philosophy.

The KPI consist of multiple measurable targets or goals in the areas of quality, environmental, health and safety. These KPI are based on risk and are indicators of not only actual performance but also continual improvement for the organization.

The KPI are assigned to responsible parties to report on the performance of processes in their areas. The EMC conducts results versus target analysis for the KPI periodically throughout each year. At the beginning of each year, the EMC reviews the previous year's results and establishes new goals for improvement and determines if any changes in the existing metrics are needed for the next year. The EMC provides resources, as appropriate, to be able to achieve the objectives of the business. During the Corporate Management Review, the KPI are reviewed. KPI performance is communicated to the company personnel through the Management Review process.

The KPI also form the basis for the Site and Departmental specific goals and objectives that are established and maintained by the Plant/Site/Department Managers. Site specific goals and objectives performance is communicated to the Site personnel through Site management processes.

6.3 Planning of Changes
Changes or modifications to the company Management System, typically as a result of altering business conditions, are handled in a planned, controlled manner such that the integrity of the Management System is not compromised. Such changes are managed through established Management of Change processes.

These changes are discussed in Corporate and Site Management Reviews.
In addition, each manufacturing facility has implemented the Training Mine management of change processes to meet and comply with requirements for quality, health, safety, and environmental. These processes maintain the integrity of the Management System and ensure its compliance with ISO 9001, and the RCMS – Technical Specification.

# 7 SUPPORT

## 7.1 Resources

### 7.1.1 General

The Executive Management Committee ensures that resource requirements are identified and provided to implement, maintain and continually improve the Management System to meet and enhance customer requirements and satisfaction.

When determining resource needs, Management considers the capabilities of, and constraints on existing resources, as well as the need to obtain resources from external providers. Resources, including knowledge bases and any other necessary information, have been provided for the proper functioning of the Management System so that its planned results can be obtained.

### 7.1.2 People

The company's Executive Management Committee ensures that staffing and skill levels within the organization are appropriate to ensure the optimal efficiency and effectiveness of our operations. Management evaluates the need for Human Resources during the budgetary process or as needed throughout the year. Management has determined and provided the persons necessary for the effective implementation of the Quality and Responsible Care management systems. These resources are also discussed as part of the Management Review process.

### 7.1.3 Infrastructure

Management ensures that facilities are maintained appropriately for the operation of the processes and to achieve conformity of the product, including workspaces, equipment, software and any supporting services related to facilities maintenance.

### 7.1.4 Environment for the Operation of Processes

Management determines and manages the work environment needed for the operation of the processes and to achieve conformity to product requirements. This is done through ensuring that appropriate human and physical factors of the work environment are considered and provided. Consideration of such factors includes; environmental, health and safety conditions; work methods; handling methods, and ambient working conditions.

### 7.1.5 Monitoring and measuring resources

Monitoring and measuring resources are controlled according to the specific site's processes and procedures. Resources are provided to ensure valid and reliable results in the form of calibration and preventive maintenance programs, trained personnel, approved external providers, and documented information as necessary. The appropriate measuring and monitoring equipment are selected based on the

parameters to be measured and accuracy required. Preventive maintenance programs ensure that equipment remains reliable and fit for use.

Measurement traceability

Where measurement accuracy and traceability is considered to be an essential part of providing confidence in the validity of measuring results, equipment is:

a) Calibrating and/or verifying at prescribed intervals against standards or equipment having a known relationship to nationally recognized standards. Where no such standards exist, the basis for calibration or verification is documented.

b) Identified in order to determine status. Measuring and test equipment is suitably identified with an identification tag on the equipment and a calibration record. The calibration status of measuring and test equipment is readily identifiable to preclude the unintended use of equipment out of calibration or under repair/maintenance. The calibration status of measuring and test equipment is documented and records of calibration are maintained.

c) Equipment is safeguarded from adjustments that would invalidate measurement results. The handling, presentation, storage, and environment of measurement and test equipment are controlled to assure that accuracy and fitness for use is maintained. This includes computer software that is used in the measuring and monitoring process.

When measurement or test equipment is found to be out of calibration, the need for reassessing the validity of previous results is investigated and the determination of any actions, as appropriate, are documented. The company shall then take appropriate action on the equipment and if deemed necessary any product affected.

### 7.1.6 Organizational Knowledge

The company has determined the knowledge necessary for operation of processes and to achieve conformity of products and services. Position specific job descriptions are developed to identify the qualifications needed. Procedures and work instructions have been developed where necessary to ensure knowledge to perform specific process tasks are maintained and available. Training programs have been developed with the evaluation of training needs to ensure transfer of knowledge. Where appropriate, cross training and succession plans are developed. As a part of the management of change, any gaps in knowledge are identified and addressed. Training or other actions may be taken to acquire additional knowledge, based upon the nature of the change.

## 7.2 Competence

The organization has determined the necessary competencies for the various positions and activities associated with the operation of its processes. All persons performing work under the organization's control that affect the performance and effectiveness of the Management System are competent on the basis of appropriate education, training, skills and experience. Training needs are determined and fulfilled according to each site's training procedures. Jobs have been setup for training on Management System documents in the TMS document control system. In addition, training on TPRI programs and documents is managed through the *Total LMS - TrainingMine application*. Records of education, training and experience are maintained as evidence of competency in accordance with Site specific procedures.

### 7.3 Awareness

Company personnel receive a Management System orientation in accordance with CR-QA-PR-0018 – *Management System Awareness Training*. The company's Safety Health Environment Quality Charter and Operating Philosophy are communicated during this training. Also included in the training are:

- General overview of ISO 9001
- Emphasis on the process approach
- Fundamental Quality Management principles
- Basic QMS process sequence and interaction
- Relevant objectives (KPI)
- Importance of each individual's role and function as a contribution to the management system effectiveness
- Benefits of improved performance
- Implications of not conforming with QMS requirements

Records of this training are maintained. This training is reinforced by all levels of Management through commitment and support, posting of the policies, review of relevant objectives for the business and the promotion of Quality and Responsible Care in various meetings and site presentations.

### 7.4 Communication

Internal communication processes are an essential component of the company Management System and are recognized as such by the Executive Management Committee. Various channels of communications have been established. Effectiveness of the Management System is communicated to various levels and functions throughout the organization through the use of periodic KPI Updates, Corporate and Site Management Reviews, Internal Audits, Corrective and Preventive Action Systems, Training and Awareness Programs. The company maintains and encourages numerous Teams that are focused not only on resolving issues and problems but are also working on continual improvement projects. Records of these teams' activities are maintained through meeting minutes. These formal processes of communication are documented through procedures in TMS that define the responsibilities, methods and frequencies for channels of communication. Augmenting the formal processes that are in place is a variety of information communicated through the e-mail system and on the TPRI company intranet (WAT).

Employee Involvement

The company has established processes by which employees can participate in the development, communication, and implementation of Management System processes. Manufacturing facilities have developed employee participation programs in accordance with their site PSM programs to ensure employee involvement in the development and maintenance of the elements of process safety. Employees are encouraged to participate on cross functional team, identify and communicate safety concerns, report and aide in the investigation of accidents/incidents, participate in the identification and implementation of corrective/preventive actions, and participate in community outreach activities.

External Communication

The company has defined the appropriate job positions that have the responsibility to communicate with external parties, such as: customers, suppliers, external auditing companies, community, regulators, tollers, contractors, carriers, external warehouses, etc.

Public and Stakeholder Communications

The company has established and implemented mechanisms to seek public and stakeholder input regarding products and operations. Information is provided to the public and relevant stakeholders concerning environmental, health, safety, and security risks and feedback is solicited. Feedback from relevant stakeholders (interested parties) is reviewed as a part of Management Review.

## 7.5 Documented Information

### 7.5.1 General

The company Management System is documented through the Safety Health Environment Quality Charter, the Operational Philosophy, the company Key Performance Indicators (KPI) and this Management System Manual. Key procedures for Management System Awareness, Document Control, Training, Management Review, Internal Auditing, Nonconforming Product, Corrective Action, and Opportunities for Risk Based Thinking are referenced where applicable in this Management System Manual. Additional controlled documents, including procedures, work instructions, lists and forms, have been created to ensure the effective planning, operation and control of the Management System processes at the Corporate and Site levels. Records that support and provide objective evidence for the Management System processes are maintained at both the Corporate and Site levels.

Controlled documentation (with the exception of records) for the Management System is managed and administered in TMS, the company's electronic document control and training system. Records are maintained in accordance to site/location specific procedures.

### 7.5.2 Creating and updating

Documents required by the Management System shall be controlled in accordance with the specified Corporate procedures. The Corporate document control procedures include the following:

- CR-DC-PR-0002 - *Preparation and Control of the HSSEQ Charter, Operational Philosophy, Key Performance Indicators, and Management System Manual*
- CR-DC-PR-0003 - *Preparation and Control of Documentation in TMS*
- CR-DC-PR-0004 - *Controlled Document Training in TMS*

These procedures, as a minimum, ensure that the Management System documentation is reviewed and approved for suitability and adequacy prior to being issued and used. Through the use of TMS, the Management System documentation is protected so it remains legible, readily identifiable, and available/suitable for use.

### 7.5.3 Control of documented information

The TMS system controls the access, distribution, and use of documented information maintained. Documentation is reviewed, updated and re-approved with

any changes and the current revision status clearly identified. Only current documents are active in the system and available for use. Obsolete documentation is archived to provide retention of knowledge and prevent unintended use. TMS tracks the revision history of documents and archived prior revisions. Additionally, where applicable in the Management System, documents of external origin are clearly identified and their distribution controlled.

Records (documented information) are controlled in accordance with the corporate procedure, CR-DC-PR-0003 - *Preparation and Control of Documentation in TMS* and site/department specific procedures governing the control of records. Records have been established and are maintained to provide confidence that the processes of the management system are being carried out as planned and to meet the requirements of ISO and RCMS. All records remain legible, readily identifiable and retrievable. Records retained as evidence of conformity are protected from unintended alterations. Record procedures define the controls needed for the identification, storage, protection, retrieval, retention and disposition of records at all relevant functions of the Management System. The company's record procedures also comply with the TPRI Records Management Program and Records Retention Schedule.

## 8 OPERATION

### 8.1 Operational Planning and Control

The company plans, develops, and controls the processes needed for the provision of products. Planning of operations is consistent with the requirements of the other processes of the Management System and takes into consideration any actions needed to address risks and opportunities. As a part of operational planning, the following are considered, as appropriate:

a) Determining the requirements for the products.
b) Specific criteria, documents, infrastructure and resources required for the operation of processes and acceptance of products.
c) Hazards and risks of products and processes.
d) Control parameters for the processes to ensure that product requirements are met.
e) Documented information maintained and retained to have confidence that the processes are being carried out as planned and to demonstrate achievement of requirements and conformity.

In general the Company's operational planning includes the following (some of these functions may be the responsibility of TPRI personnel):

a) Customer order review and acceptance process and customer communications.
b) Product development, New Item Setup Plan, and process trials.
c) Purchasing requirements and control of externally provided products, processes and services.
d) Production process controls.
e) Detailed Procedures and Work Instructions, where necessary
f) Management of Change
g) In-Process, Final Product Inspection and Testing, and release of products
h) Packaging, Labeling, Storage and Handling Requirements
i) Preventive Maintenance Programs to improve reliability of process equipment
j) Identification and control of property belonging to the customer or external provider

k) Competence, Awareness and Training Requirements for Personnel
l) Internal Audit Program
m) Corrective Action Systems (Including Customer Complaints)
n) Consideration of post-delivery activities
o) Records to be retained

## 8.2 Requirements for Products and Services

### 8.2.1 Customer communications

Customer communications are typically routed through Sales, Business Management and/or TPRI Customer Service. Where appropriate Sales, Business Management and/or TPRI Customer Service personnel may contact other company personnel to assist and provide customers with technical information or information related to specific issues.

Processes for communicating with customers are in place including:

a) Communication via sales/ marketing/ business management to provide information related to the products
b) Communication regarding customer requirements, inquiries, contracts or orders, including changes to orders, through TPRI Customer Service Group and Sales/ Marketing
c) Handling of customer complaints through the QA group and other types of customer feedback related to products and services communicated through Sales/ Marketing/ Business management. Company personnel are empowered to take customer complaints and enter the complaint information into the corrective action system whereby the complaint is routed to the responsible party in a timely and effective manner. Complaints taken by TPRI Customer Service are communicated to the Quality Manager who will enter them into the Complaint system whereby the complaint is routed to the responsible party in a timely and effective manner. The TPRI Customer Service Group is responsible for investigating causes and developing corrective action plans for any complaints received for activities performed by the outsourced TPRI Customer Service group.
d) Handling and control of customer property is addressed at specific production sites where applicable
e) Communication regarding contingency actions, when relevant.

### 8.2.2 Determination of Requirements for Products and Services

The company determines requirements for products and services to be offered to customers at various stages within the planning process. Business Management, Sales, Research and Development, and Outsourced TPRI Shared Services for Customer Service and EHSS may all be involved in the determination of these requirements to ensure that the company can meet all claims for the products and services offered. The following types of requirements are determined to the best of the organization's ability:

a) Requirements specified by the customer, including the requirements for delivery and post-delivery activities. Batch strategies are setup in the ERP System relating to customer requirements that are then used during the inquiry, quotation, and order process.

b) Requirements not stated by the customer but necessary for specified or intended use, where known.
c) Statutory and regulatory requirements applicable to the product.
d) Any additional requirements considered necessary by the company.

8.2.3 Review of Requirements for Products and Services

Prior to the submission of a quotation or acceptance of an order, including verbal orders, The Company requires that a review take place to ensure that the customer's requirements for the product have been clearly defined and documented. Various activities within the Customer order and fulfillment process are outsourced to the TPRI Customer Service Group. The TCV Customer Service process flow documents in TMS including CR-CS-PR-0001, *Customer Order Review Process,* contain detailed descriptions of the process steps, controls identified, interfaces and responsibilities, and records maintained. As a part of this process the TCV manufacturing facilities review orders to ensure that the company has the ability to meet customer requirements and requirements for products to be supplied, including any statutory and regulatory requirements applicable to the products. If a received order or contract differs from the associated quotation, the differences are resolved before accepting and processing the order. Records are retained in accordance with established procedures. Responsibilities for the retention of records are defined within TCV and TPRI records procedures.

8.2.4 Changes to requirements for products and services

Contract amendments, notifications, and change orders regarding the product or order are received and reviewed against the original contract and or order and are documented accordingly. Relevant personnel are made aware of the change requirements through SAP order reports. Records are retained in accordance with established procedures.

8.3 Design and Development of products and services

8.3.1 General

Cray Valley has developed, implemented and maintains a design and development process for new products.

8.3.2 Design and Development Planning

New products intended for development and production at a company manufacturing facility or an approved external manufacturing facility such as a toller are designed and developed according to planned and controlled processes.

Through the R&D Synthesis group, new products are developed as defined in CR-PD-PR-0001 New Product Development Process. This planned and controlled process includes input from Research & Development, Sales, Business Management, Quality, TPRI Environmental, Health & Safety and Production Management groups, as appropriate. Responsibilities for design and development activities are assigned to qualified personnel. Availability of adequate resources for design and manufacture of the product are also considered. Development projects are managed as defined in CR-PD-PR-0013, Project Management Process.

8.3.3 Design and Development Inputs
Research and Development coordinates with TPRI Environmental, Health and Safety to ensure that appropriate safety and environmental requirements and considerations are included in design and development inputs. Hazards are identified and risk assessments are performed. This provides for the safe manufacturing and handling of products by all stakeholders and the protection of the environment throughout the design process.

Where applicable design and development information from previous similar products is considered and used during the design and development input phase. This information is documented in the applicable lab reports, and process trial reports, as well as; any other requirements that are necessary for a successful new product introduction.

New product specifications, including formulations, product characteristics, bill of materials, packaging, resource needs including warehousing, and where applicable; performance requirements are defined and communicated to appropriate personnel by Research & Development, Sales, Business Management, Production Management and Quality groups in a planned and controlled manner.

As appropriate, developmental materials are transferred to manufacturing facilities for trial production through controlled process trials. To ensure effective communication, process trial plans and controls are documented in applicable manufacturing site procedures and Management of Change, which include defined responsibilities and authorities for qualified personnel.

Throughout the design and development phase and the process trial phase, appropriate reviews, and verifications are conducted in accordance with the documented procedures. When determined appropriate by the business, transfer of developmental products to commercial status proceeds as defined in CR-PD-PR-0007, Commercial Development Review Process.

8.3.4 Design and Development Controls
The Company's design and development reviews involve the analysis by responsible and authorized individuals and process trial at planned intervals in accordance with defined procedures. Research & Development, Sales, Business Management, Quality, EH&S and Production Management groups are involved in these reviews during various stages of the design and development process.

The reviews include a verification that all required inputs and outputs are in place. Product verification and validation (if applicable) are performed in accordance with the applicable quality control and production process trial procedures.

During the course of these reviews, any actions resulting from them are documented accordingly in the applicable record.

Design and development verification for new products is performed according to planned and controlled arrangements primarily using laboratory analysis of product

characteristics and a production engineering (or equivalent) analysis of the process requirements. These analyses ensure that the new product has met the desired output criteria. A new product which does not meet design and development criteria is not released unless authorized by the internal or external customer.

Records of these verifications and any actions resulting from these verifications are maintained in the form of the applicable quality control inspection plan, production batch packet or plan, and the process trial documentation for the new product of interest.

The company's products are designed and developed to be used by a variety of customers in a variety of applications. The company often engages with customers to assist in their formulations and needs through co-operative interactions. However due to the multi-purpose applications and the product transformations that occur as a result of customer formulations, the company typically does not perform formal validations. Customers often will not share validation results with the company due to their proprietary nature. However should a formal validation be required for a new product, it will be conducted according to planned and controlled arrangements as mutually agreed upon with the customer. Records of such validations will be maintained by the appropriate the company group responsible for the validation.

8.3.5 Design and Development Outputs

The company's design and development output for a successful new product introduction consists of the following;

a) completed and approved process trial
b) risk assessment
c) controlled product specifications, including formulation and bill of materials
d) SDS and any other pertinent environmental and safety information required for the safe manufacturing and handling of the new product
e) identification of the manufacturing site and any additional warehouses required for product realization
f) identification of any new critical raw materials including the recommended supplier/producer
g) production manufacturing plan (e.g. production batch packet)
h) quality control inspection plan for critical raw materials, in-process and final product testing (e.g. qc inspection datasheets)
i) packaging and labeling requirements
j) new or modified procedures/work instructions for operations
k) training records for any new or modified procedures/work instructions
l) costing

Using the outputs referenced above, the company ensures that new product is not released unless it meets the design and development inputs unless authorized by the internal or external customer.

8.3.6 Design and Development Changes

Design and development changes are handled in a planned and controlled manner. Changes to product specifications and process are identified, documented, reviewed

and approved by authorized personnel prior to implementation. These personnel include representatives from the following groups: Research & Development, Sales, Business Management, Quality, EH&S and Production Management as appropriate. In cases where applicable, customers are contacted prior to implementing the design and development change. Records of development changes and necessary actions are maintained by the appropriate company group.

## 8.4 Control of Externally provided Processes, Products and Services

### 8.4.1 General

The company's Corporate Quality Group and manufacturing site Quality Control and Purchasing functions, in cooperation with outsourced TPRI Purchasing, ensure that purchased goods and/or services conform to the company's specified purchase requirements through controls documented in this manual, the RPA Purchasing Manual P2P process, TCV Purchasing and Site specific procedures and work instructions.

The company partially outsources its purchasing processes to the TPRI shared services Purchasing and Logistics groups. The following activities are currently being performed by TPRI shared service: the Purchase Order process and the evaluation and re-evaluation of approved packaging material suppliers, carrier, and external warehouse services. The company ensures control over its outsourced processes and verifies that the outsourcing does not impact the company's ability to provide product that conforms to requirements.

The company utilizes external providers, such as tollers, distributors and external warehouses. Where products and services are provided directly to the customers by these external providers, the company has processes in place to ensure control over these external providers and has determined criteria for evaluation, selection and monitoring of performance.

### 8.4.2 Type and extent of control

Where applicable, suppliers for goods and/or services including but not limited to critical raw materials[1], resale material (including tolled manufactured material) and containers are selected based on meeting the company's Quality, Environmental, Health, Safety, Security and business criteria. Quality, Environmental, Health, Safety, Security and business criteria are dependent on the purchased goods and/or services impact on the production process and/or quality of the final product. The criteria for supplier selection, evaluation, and re-evaluation are documented in the company's procedures for supplier qualification and approval and referenced TPRI documents. Incoming inspection activities are documented in Site specific procedures and work instructions. In addition to initial evaluation and selection, where applicable, suppliers are re-evaluated through incoming inspection and annual supplier performance evaluations. These records are maintained.

For any outsourced processes, the company's Management System ensures that these processes are controlled to the extent necessary to prevent from adversely

[1] The definition of critical raw materials is site specific and contained in site-specific documentation.

affecting the organization's ability to consistently deliver conforming products and services to our customers. The company ensures that externally provided processes remain within the control of the Quality Management System. Controls are applied to the external provider and to the outputs as defined in applicable procedures. Outsourced processes that are performed by Total Petrochemicals and Refining (TPRI) shared services for all manufacturing locations include Purchasing, Customer Service, and Logistics (carrier and warehouse management). Outsourced processes that are performed by Lyondell Basel for the Channelview, TX manufacturing facility include operations, maintenance, scheduling and warehouse activities. Outsourced processes that are performed by ITI for the Beaumont, TX facility include packaging and warehouse activities.

Purchased products are verified upon receipt according to applicable Receiving Inspection and Test procedures. These procedures ensure that purchased product is not used or processed until it has been inspected or otherwise verified to meet specified requirements. The extent of the receiving inspection and testing performed is based on the nature of the purchased product and the history of the Supplier providing the product. Where testing of purchased product is deemed not necessary, Certificates of Analysis or review of manufacturing SPC records may be required.

In the event that incoming purchased product is used prior to verification of meeting specified requirements, the product must be approved for use in accordance with site specific procedures. The Production Department will document the final product batch/lot that the purchased product was used for should it become necessary to reject or recall the final product due to a failure caused by the purchased product not meeting specified requirements. Use of purchased product not meeting specified requirements is procedurally controlled at the individual manufacturing Sites including authorization by responsible qualified personnel.

### 8.4.3 Information for External Providers

Resource or purchasing requirements are typically initiated by the company through the creation of a purchase requisition in the ERP System by authorized company personnel. Controls over authorizations to perform any part of the process in the ERP system have been setup so that only authorized personnel may complete the activities. Purchases may only be made from approved Vendors. TPRI Purchasing converts the purchase requisition into a Purchase Order (PO). The PO is then approved by an appropriate TCV individual possessing a sufficient delegation of authority in the ERP System. Once approved the PO is forwarded to the Supplier. All steps in the process follow *The RPA Purchasing Manual's Purchase to Pay (P2P) process* and the company's personnel performing purchasing activities have received training on this process. PO records are maintained in the ERP System.

Where applicable, purchasing documents (PR and PO) will contain information and requirements deemed necessary by Purchasing, and the applicable company Site/Departments. This information contains where appropriate:

a) A Clear Description of the Goods and/or Services
b) Pertinent Specifications
c) A Precise Definition of the Type, Class or Grade of the Goods and/or Services

d) Identification of any Required Management System or Applicable Standards
e) Requirements for Approval or Qualification for the Goods and/or Services, Procedures, Processes or Personnel

Purchasing documents (PR and PO) are reviewed by TPRI Purchasing and authorized TCV personnel for accuracy and completeness prior to being issued to the Supplier.

Should the Company or our customers decide to verify purchased product at our supplier's premises prior to delivery, the arrangements, verification and release of such purchased products will be determined by Sales, Quality Control and Operations and when applicable by our customers. These arrangements and verification/release requirements will be documented on the Purchase Order by Purchasing or on the Contract by Sales and Marketing.

8.5 Production and Service Provision

8.5.1 Control of Production and Service Provision

The production of the company's product is planned and carried out by qualified and trained personnel according to controlled procedures and work instructions. Groups responsible at the manufacturing Sites include: Production, Production Engineering, Safety, Maintenance, Shipping/Receiving and Quality Control. At the Corporate level the following functions may also be included: Production Planning, Quality Assurance, Marketing, Sales and Business Management, Environment Health and Safety, Process Engineering, and Project Engineering.

The controls in place for production include:

a) The availability of documented procedures and work instructions, which define proper work practices, equipment, production processes and criteria to be used for product conformity
b) Product characteristic information, including quality criteria (critical raw material requirements, in-process product requirements and final product requirements) and frequency of testing.
c) Availability and use of approved monitoring and measurement equipment
d) Implementation of preventive maintenance and calibration program to ensure process capability for process equipment and monitoring and measuring equipment.
e) The implementation of monitoring and measurement activities as specified in Production and Quality Control documentation to verify product conformity.
f) Through the appointment of competent personnel for operation of processes, training programs and written instructions, the company strives to prevent human error.
g) Release, delivery and post-delivery activities in accordance with contractual requirements, sales order requirements and regulatory requirements.

The Company does not service product. Should servicing become necessary, processes will be established to meet these requirements.

Production process outputs at the company are verifiable by subsequent monitoring and measuring typically during in-process and final testing of product. The company currently does not have any processes where resulting output cannot be verified. Should any production process be put in place, whereby the output cannot be verified, the company will apply methods to validate the process prior to use to demonstrate the process's ability to meet requirement. Such validation will involve qualifying the process, equipment, and personnel, as well as defining the work methods, procedures, required records for the process and its re-validation.

8.5.2 Identification and Traceability

The company's manufacturing Sites maintain procedures to assign all final products with a unique identification whether it is manufactured via a batch or continuous process. These identifications are recorded and provide traceability of all batches and continuously produced products from raw material stage to final testing. This identification follows the product through the completion of processing steps. In some instances, a unique lot number in addition to the unique batch number will be assigned. This company lot number and/or batch number will become the company identification used for traceability of all company final products through delivery. These records are maintained at each manufacturing facility.

8.5.3 Property belonging to Customers or External Providers

Property belonging to customers or external providers shall be handled by the company in accordance with applicable Site controls. These controls include as a minimum, identification, verification, and protection.

Customer supplied property will be received in a manner similar to any other materials purchased by the company that are incorporated into product sold by the company. If any customer-supplied property is lost, damaged or found to be unfit for use, the customer will be promptly notified. Records of customer property including notifications of any degradation will be maintained at the applicable site.

External provider property will be identified and handled on an individual basis, based on the item provided and any contractual agreements. If any external provider property is lost, damaged or found to be unfit for use, the external provider will be promptly notified. Records of external provider property including notifications of any degradation will be maintained at the applicable site.

8.5.4 Preservation

All materials and products under the company’s control are stored and handled in such a way as to preserve the product in order to maintain conformity to requirements. Such protection is also extended to product being delivered, which is packaged appropriately to preserve product during delivery in order maintain conformity to requirements.

Employees handle items in such a manner as to ensure their own safety and the safety of others. All employees involved in the handling of products take care to handle and store them in such a manner as to prevent damage and deterioration and

to maintain product identification. Appropriate handling and transport equipment is used at all times.

Products stored and shipped from off-site contracted warehouses are handled in such a manner as to preserve conformity of the product. The TPRI shared services Logistics Group evaluates potential warehouses and communicates all applicable storage, handling, and shipping requirements to the warehouses. As a minimum, contracted warehouses must have in place the types of storage and shipping controls that are required by the company before they will be used. Records of warehouse evaluations are maintained by the TPRI Logistics Group and made available to the company as necessary.

#### 8.5.5 Post-delivery Activities

The Company does not service product. Should servicing become necessary, processes will be established to meet these requirements. The company has determined statutory and regulatory requirements and products are appropriately labeled. The company will provide SDS, safe handling and technical support upon request. Product risks are assessed by the TPRI Product Safety group and the nature and shelf life of products have been defined. Customer returns and complaints are handled in accordance with defined procedures.

#### 8.5.6 Control of Changes

The company reviews and controls changes for production processes through defined management of change processes at each manufacturing facility. Records describing the review of the changes, the person authorizing the change and any necessary actions arising from the review of change are maintained in the TrainingMine system.

### 8.6 Release of Products and Services

The company monitors and measures product characteristics to demonstrate and verify that product requirements are met and to take corrective action as necessary when product requirements are not met.

The monitoring and measuring of product characteristics takes place through receipt of critical raw materials, in-process manufacturing, final product processing, packaging and delivery and is performed in accordance with production and quality procedures. This includes but is not limited to instructions, methodology or technique, inspection-test-measurement equipment identification, characteristic identification, specifications with acceptance criteria, as well as any special environmental, health or safety information.

The company retains documented information (records) including evidence of conformity with acceptance criteria and indicating the authorized personnel releasing the product to subsequent operations throughout the manufacturing phases through receipt of critical raw materials to finished goods inventory and delivery.

Product (including critical raw materials) is not released to subsequent operations until all planned arrangements have been satisfactorily completed unless authorized by relevant personnel as detailed in controlled procedures. Product is not released to the customer until

all planned arrangements have been satisfactorily completed unless authorized by the customer.

### 8.7 Control of Nonconforming Outputs

8.7.1 Critical raw materials, in-process and final product found to be nonconforming to specified requirements are identified as such, segregated to the extent possible, and assigned a disposition in accordance with manufacturing site procedures for the control of nonconforming products. Site procedures for the handling of Nonconforming product follow the requirements specified in the corporate procedure CR-QA-PR-0019, *Control of Nonconforming Product*.

Suppliers of critical raw materials found to be nonconforming will be issued a corrective action request through the SNN system in ETQ in accordance with CR-PU-PR-0005, *Supplier Nonconformance Notice*.

Disposition and authorization for use of nonconforming raw materials, in-process and final product is made by authorized individuals in accordance with CR-QA-PR-0019 and Site-specific processes. Nonconforming product that is reworked is re-verified against specifications to ensure product conformity.

Final product that does not conform to specified requirements may be offered to customers for concession. The company's Business Management makes the decision to sell off-spec material and coordinates the generation and communication of off-spec release waivers to the customer through the appropriate manufacturing site Quality Representative and the TPRI Customer Service Group. Site Quality Control Management ensures accurate reporting of the product nonconformity on the release/waiver document. The TPRI Customer Service group forwards the release waiver document to the customer for authorization. The controls and responsibilities associated with these activities are defined in the company's Off-Spec Release/Waiver Process flow document.

If nonconforming product is detected only after delivery or use has started, Marketing and Sales personnel, Business Management, Quality Control and/or Quality Assurance personnel will ensure that all affected parties are aware of the nonconformity, as appropriate to the effects or potential effects of the nonconformity.

8.7.2 Documented information retained for nonconforming outputs will include: description of the nonconformity and any actions taken, identification of the authority deciding the action in respect to the nonconformity, and any concessions obtained.

## 9 PERFORMANCE EVALUATION

### 9.1 Monitoring, Measurement, Analysis and Evaluation

9.1.1 General

Ongoing monitoring, measuring, analysis and evaluation of the Management System processes not only provide verification of performance but also provides the

foundation for evaluating effectiveness of the quality management system and identifying improvement opportunities.

The monitoring and measuring processes are designed and implemented to ensure valid results in order to analyze and evaluate quality management system processes and products. Through evaluation of monitoring and measurement results management can make certain that the Management System performs effectively.

Product requirement conformity is demonstrated through the use of documented information, which define the necessary monitoring and measurement processes for the manufacture and inspection of our product.

Evaluation of the Management System's performance and effectiveness is performed through the use of Safety Health Environment Quality Charter, Key Performance Indicators, Operational Philosophy, internal and external audit results, analysis of product performance and customer feedback data, corrective and preventive actions, and Management Reviews.

Monitoring, measuring, analysis and evaluation are determined, authorized, and implemented by the responsible individuals within the company and are documented accordingly in appropriate procedures. If through the process of monitoring, measuring and analysis deficiencies are identified, correct action systems are in place to address these deficiencies.

9.1.2 Customer Satisfaction

Customer satisfaction is determined through multiple measurement processes in the company Management System. The company management analyzes these measurements so that performance in meeting and exceeding customer requirements and customer perception of the company is determined.

Customer satisfaction measurements included in the KPI are reviewed semi-annually by the Executive Management Committee. Analysis of this data by the Executive Management Committee may lead to action plans for continual improvement. Customer scorecard are reviewed by Quality Assurance and action taken as appropriate. The customer satisfaction data is also analyzed in Management Review.

Our Sales and Marketing groups stay in contact with customers regularly where issues such as product performance, current and future needs are discussed and handled. Records of these contacts are maintained through Call Reports and sent to Management Representatives throughout the organization. The company provides opportunities for customer feedback through participation in trade shows throughout the year.

Periodically a cross-functional team consisting of relevant functions may solicit customer feedback through use of customer surveys. The company maintains partnership teams with customers with which information is shared and acted upon.

### 9.1.3 Analysis and Evaluation

Continuing suitability and effectiveness of the company Management System is determined through the collection and analysis of data. The evaluation of this data also includes identifying opportunities for improving the effectiveness of the Management System.

The collection and analysis of data is done at both the Site and Corporate levels through the Management Reviews as indicated in section 9.3 of this Management System Manual. Data presented during these reviews includes multiple sources of information on customer satisfaction, conformity to product and services, management of change, product and process characteristics and trends, effectiveness of actions to address risks and opportunities, and external providers. Records of the analysis of these data sources are maintained in the Management Review meeting minutes.

## 9.2 Internal Audit

The company conducts Internal Audits at planned intervals to determine whether or not the Management System conforms to the requirements of this Management System Manual, ISO 9001, Responsible Care® Management System Technical Specification and whether or not the system has been effectively implemented and maintained. Such audits are conducted in accordance with the Internal Audit procedures. The procedures define the requirements for qualification of personnel performing auditing, internal audit scheduling, conduct of audits including identification of nonconformities, opportunities for improvement, and for recording the audit results and reporting them to management. These procedures are listed below:

- CR-QA-PR-0001 - *Internal Auditor Qualification and Training*
- CR-QA-PR-0002 - *Developing the Internal Audit Schedule and Conducting Audits*
- CR-QA-PR-0014 - *Internal Audit Corrective Action Requests*

The Internal Lead Auditor, or designee, is responsible for scheduling and managing regular internal audits. Every area of the company that affects product requirements will be scheduled for internal audits according to the status and importance of the activities being audited.

Selection of Internal Auditors for each audit is based on impartiality and objectivity of the area being audited. Internal Auditors are trained in accordance with CR-QA-PR-0001 and do not audit their own work.

Nonconformities are recorded on Internal Audit Corrective Action Requests and issued to the responsible party. Responsible Area Management ensures that timely and effective corrective action is taken. Auditing personnel verify the adequacy and effectiveness of the corrective action and any preventive action taken. This may be completed by reviewing and verifying any necessary corrections and corrective actions or by inclusion for review in subsequent audits or special follow-up audits. Internal Audit results and subsequent analyses are an integral part of Management Reviews.

9.3 Management Review

9.3.1 General

Corporate and Site Management Reviews are held to assess and evaluate the Management System to ensure its continued effectiveness and suitability in satisfying the requirements of this Management System and KPI performance.

Corporate Management Reviews are conducted periodically in accordance with CR-QA-PR-0023 - *Corporate Management Review*. Site Management Reviews are conducted at least annually in accordance with the site-specific procedure.

Topics discussed during the Management Reviews and resulting action plans are recorded in meeting records, which are maintained. Results of the Site Management Reviews are communicated to the Quality Manager for incorporation into the Corporate Management Review Meeting. The results of the Corporate Management Reviews are communicated to the Site ISO Coordinators for dissemination to Site personnel as appropriate.

9.3.2 Management Review Inputs

As a minimum for the Corporate and the Site Management Reviews the following topics are addressed:

a) Status of actions from previous Management Review
b) Changes in external and internal issues that are relevant to the QMS
c) Information on the performance and effectiveness of the QMS, including trends
    1. Customer satisfaction and feedback from relevant interested parties
    2. The extent to which quality objective have been met
    3. Process performance and product conformance analyses
    4. Nonconforming and corrective actions
    5. Monitoring and measuring results
    6. Audit results
    7. Performance of external providers
d) The adequacy of resources.
e) The effectiveness of actions taken to address risks and opportunities.
f) Opportunities for improvement.
g) Any other information deemed appropriate, if applicable.

Data from both Quality and RCMS processes will be reviewed in these areas. During the Corporate Management Review, the Safety Health Environmental Quality Charter and Operating Philosophy are reviewed for continuing suitability.

9.3.3 Management Review Outputs

Outputs from the Corporate and Site Management Reviews include action items regarding any changes or improvements to the Management System, improvement of the product in relation to customer requirements, and the identification of any needed resources to ensure the continuing effectiveness of our quality management systems. The Corporate Management Review output also includes the results of the review of the continuing suitability of the

Safety Health Environmental Quality Charter and Operating Philosophy.
Records of the results of management review are retained.

10 Improvement

10.1 General

The company determines opportunities for improvement through the use of SWOT, Quality Policy, KPI reviews, internal and external audit results, analysis of data, corrective and preventive actions, feedback from relevant interested parties, and Corporate and Site Management Reviews. Management evaluates and identifies opportunities to pursue and implement to meet customer requirements, enhance customer satisfaction, minimize risk, correct deficiencies, and improve the performance and effectiveness of the quality management system.

10.2 Nonconformity and Corrective Action

When a nonconformity occurs, including any arising from complaints, the organization will react to the nonconformity and take action to control, correct, and deal with any consequences. Based on the nature of the nonconformity, it will be entered into the appropriate corrective action process for further investigation for root cause.

Corrective actions are taken to eliminate the causes of nonconformities in order to prevent their recurrence. Actions taken are appropriate to the impact of the problems encountered. Corrective Actions may be initiated by anyone in the company according to the corrective action procedure, CR-QA-PR-0020 - *Corrective Action Processes*. Such actions will be handled and recorded according to the applicable corrective action process.
Each of the company corrective action processes includes the following elements:

- Determine and implement the immediate action needed to correct the nonconformity as applicable.
- Determine the most probable cause or causes as applicable.
- Evaluate, determine and implement the action needed to prevent recurrence of the nonconformity as applicable.
- Determine if similar nonconformities exist or could potentially occur.
- Reviewing the effectiveness of the corrective actions taken.
- Update risks and opportunities if applicable.
- Make changes to the quality management system if necessary.

Records of nonconformity and corrective actions will be retained.

Accident/Incidents

The organization has established and implemented a system to identify and investigate incidents and accidents in order to identify root causes and implement corrective/preventive actions to mitigate any adverse impacts. Accidents and incidents are investigated and reported in the IMPACT incident investigation software. The TPRI EHS&S Group will assist with accident/incident investigation as needed. Records of accident/incident investigations are maintained and key findings are shared with employees and other relevant stakeholders.

10.3 Continual Improvement

The company strives to continually improve the suitability, adequacy and effectiveness of the quality management system using the results of analysis and evaluation of the various quality management processes defined within this management system manual and the

outputs of management review. Through these processes, management will determine if there are needs or opportunities that shall be addressed as part of continual improvement.

Appendix 1
Responsible Care (RCMS) Related Documents

| | |
| --- | --- |
| CR-PD-PR-0011 | Risk Assessment Procedure |
| CR-CM-PR-0007 | Distribution of Non-Regulatory Environmental, Health, Safety and Risk-Related Information to Customers and Other Direct Product Receiver |
| CR-CM-PR-0025 | Product Stewardship Procedure for Customers and other Direct Product Receivers |
| CR-SM-PR-0010 | Procedure to Minimize Business Disruption |
| CR-EC-SR-0004 | Waste Service Provider Evaluations |
| CR-EC-PR-0001 | Regulatory Requirements to Operate |
| Various IDs | Fact Sheets – by location in TMS |
| Various IDs | Manufacturing Site procedures for Process Hazard Analysis, Management of Change, Employee Participation, Incident Investigation, Crisis Communication, Emergency Response, and Permit to Operate Assessment |
| Total WAT website | Responsible Care Global Charter |
| Total WAT RC/RPA/HSSE | Incident Management<br>Industrial Hygiene Occupational Health<br>RPA Maestro Management System<br>Product Stewardship<br>Responsible Care<br>Security<br>Transportation |