Product Transfer Inspection Manual

Prepared by
Transportation and Logistics Services
Chevron Phillips Chemical Company LP

Approved by:
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Motor Carrier and Terminal Services
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Document Control

The CPChem Product Transfer Inspection Manual is a controlled document and may not be changed or altered without the written consent of Petrochemical Logistics (Motor Carrier & Terminal Services/Transportation & Logistics Services/Olefins & Polyolefins Division of the Chevron Phillips Chemical Company LP, The Woodlands, Texas).

Printed copies of this document are good for the day they are printed. It is the recommendation of the Chevron Phillips Chemical Company LP that the users of this manual make frequent checks of the cpchem.com web site to assure the most up to date version of the manual is used.

All recommendations for changes should be address to:

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Overall:
1. Changed Customer Account Representative (CSR or CSR’s) to Customer Account Coordinator (CAC or CAC’s) throughout the document

Added new procedure:
1. PINS 01: Barge pre-inspection at shipyard or cleaning facility

Revised procedures:
1. INS 03: Change deadline for reports
2. INS 04: Invoicing – revised Step 3
3. INS 05: Inspecting Receiving Tanks and Transfer Piping for Suitability – revised Responsibilities section, Step 1, and Step 3; added Step 5 and Step 6
4. INS 10: Collecting Samples – added Chain of Custody to list of required forms and revised Note
5. INS 11: Inspecting During Loading – revised Step 1 and Step 10

Revised documents:
1. Certificate of Shore Quantities – revised list of reporting units
2. Certificate of Vessel or Tank Cleanliness – revised list of required elements
3. Certificate of Vessel Quantities (Opening and Closing) – revised list of reporting units
4. Distribution of Samples/Sample Receipts – revised retain period
5. Summary Report – revised list of required elements
6. Scale Tickets – revised list of required elements

Deleted reference materials:
1. Tank Preparation Chart
2. Tank Preparation Additional Notes

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Preface

Chevron Phillips Chemical Company LP delivers products to our customers and exchange partners and receives products from our suppliers and other exchange partners that meet or exceed required specifications 100% of the time. This high quality approach requires improving programs to maintain product quality when feedback and experience show such improvements are warranted. The Product Transfer Inspection Program described herein is a clarification of the guidance previously issued by Chevron Chemical Company, LLP as the “Product Transfer Instruction Manual, dated April, 2000.” This clarification formalizes requirements and guidance for minimizing the number of product integrity, product quality, and stock loss incidents involved in product transfers by outlining the roles of the partners involved, principally, the independent inspection companies.

The independence and quality of the product transfer inspection companies add to the confidence level of all parties in the results of inspections that meet company requirements. These inspection results have a direct impact on the company’s ability to maintain product integrity and to track and invoice product shipments accurately and to the satisfaction of all parties to the transfers. As such these inspections are essential to continuing good business relations. The inspection parameters outlined in this Product Transfer Inspection Program affect selecting qualified inspection companies, contracting for specific product transfer inspection services, and outlining the scope of inspection procedures meeting CPChem requirements.

Outlining requirements and guidance establishes the scope of tasks that meet requirements without restricting how the parties fulfill their respective responsibilities. Although the company’s expectations for quality are the same world-wide, specific techniques and methodology may differ for meeting company requirements; therefore, this document does not prescribe how to achieve the outlined requirements. The process for qualifying independent inspection companies provides adequate assurance that the methodologies these companies employ yield highly reliable results.

Suggestions are incorporated herein for how to use these requirements and guidelines. These requirements and guidelines apply to company facilities and personnel as well as independent inspection companies.

This document has been reviewed by a sample of prospective users and their comments have been considered to make the content both practical and cost effective.

This Document can viewed on the worldwide web (internet) at the following URL; http://www.cpchem.com/enu/docs_corporate/ProductTransferInspectionManual.pdf

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Product Transfer Inspection Program

Purpose
The Product Transfer Inspection Program enables Chevron Phillips Chemical to:
- work with qualified inspection companies
- receive higher quality service
- ensure delivery of high quality products
- improve joint processes
- address excessive variance.

Criteria for Selecting Inspection Companies
Chevron Phillips Chemical uses a selection process to develop a list of approved inspection companies involving the review and approval of the inspection companies’ operations applicable to services for Chevron Phillips Chemical. This includes the following functions:
- safety program
- quality program
- formal training program
- drug, alcohol, and firearms program
- U.S. Customs approval
- ISO certification
- laboratory capabilities for required testing.

Once part of the program, inspection companies are expected to:
- communicate effectively with all parties involved in the inspection
- perform requested services to the highest of CPChem and industry standards.

Inspection companies are continuously evaluated through:
- feedback from the CPChem participants on the quality of their performance
- spot field audits by CPChem’s Petrochemical Logistics and Customer Tech Service Group
- feedback from CPChem Customer Account Coordinators (CAC); hereafter CAC’s

Responsibilities of the Inspection Company
CPChem CAC’s nominate companies for inspections based on the:
- professionalism of the service
- expertise of individual inspector/surveyors
- lab capabilities
- quality of the inspection companies’ reporting procedures
- thoroughness of the reported data.

IF more than one inspection company is appointed, THEN all parties must:
- be present for all inspection and/or sampling activities during the transfer
- agree on all quantities prior to departing from the terminal.
CPChem relies upon inspector/surveyors to:
  - identify opportunities for improvement
  - make recommendations for corrective action to the CPChem CAC.

**IF** a problem occurs during the transfer, **THEN**
  - complete an initial assessment
  - discuss possible corrective actions with the CAC.

**Equipment Requirements**

The inspector/surveyor will bring:
  - gauging tape
  - thermometers
  - sample equipment
  - all other equipment required for a clean water-white chemical inspection.

Equipment must be:
  - compliant with API RP 2003, Section 4.5.6.3 regarding static electricity
  - clean
  - in good condition
  - regularly calibrated.

Inspectors/surveyors will use their own equipment. Vessel thermometers and gauging tapes are **not to be used**. The constant wear this equipment receives may cause variances in the calculations.

--END--
Personnel Policies

CPChem’s concern for the safety of employees, the public, and the environment is expressed in the corporate policies that define management expectations and employee guidance. These same policies are applicable to contractors and subcontractors operating on CPChem premises and/or handling CPChem products. A summary of the policy points applicable to inspection companies and their employees contracted by CPChem for product transfer services is given below.

CPChem may suspend work or terminate a contract as a result of violation of these policies. When appropriate, local law enforcement agencies will be advised of violations.

Drug, Alcohol and Firearms Policy

CPChem policy prohibits the use, sale, possession, distribution, purchase, or transportation of:

- illegal drugs
- controlled substances
- alcohol
- explosives
- unauthorized flammable materials
- firearms
- other weapons.

Definitions

Controlled Substance

Controlled substances include:

- opiates
- heroin
- hallucinogens
- marijuana
- mescaline
- peyote
- cocaine
- PCP.

In addition, prescription drugs are considered controlled substances if they:

- are not obtained and used under a prescription lawfully issued to the person possessing them
- are not authorized by CPChem medical staff
- are included in the Federal Controlled Substance Act or its regulations.

Controlled Substance/Alcohol Test

A controlled substance or alcohol test is any test using blood, urine, breath or other samples to determine the presence of controlled substances or alcohol in the body.
Company Premises
The following constitute company premises if they are owned, leased, or in use by CPChem for any purpose:
- land
- property
- buildings
- structures
- installations
- vehicles
- equipment
- aircraft
- water craft.

Under the Influence of Alcohol
An individual having a blood alcohol concentration (%BAC) of 0.04% or above is defined as being under the influence of alcohol.

Policy Enforcement for Contractors and Subcontractors
The Drug, Alcohol and Firearms Policy applies to contractors and subcontractors to the same extent as it does to CPChem employees. Any person violating this policy will be removed from company premises and denied future access to the premises and affiliated companies.

Searches
Unless prohibited by law, CPChem may search individuals and their personal effects:
- when entering CPChem premises
- while on CPChem premises
- when leaving CPChem premises.

The Company may require contractors and subcontractors to search their employees under the same circumstances as above.

Entry onto CPChem premises constitutes consent to search the individual and his or her effects, including:
- packages, including but limited to DOT containers and samples
- briefcases
- purses
- lunch boxes
- vehicle
- office
- locker
- closet
- desk.

Individuals may decline to cooperate, however, refusal shall be cause to bar the individual from the premises of CPChem or affiliated companies.
Testing

Unless prohibited by law, CPChem may request that contractors conduct controlled substance and/or alcohol tests on any of their employees or subcontractors’ employees who are:

- on company premises
- engaged in company business
- operating company equipment.

Prior written consent will be obtained from any person who is being tested. A positive test on a contractor or subcontractor employee or failure to give written consent for a test is cause for removal from company premises. The employee will also be restricted or disqualified from performing services for CPChem or affiliated companies.

Notification of Search and/or Testing by Contractor

Prior to conducting a search and/or testing of its or subcontractors’ employees on CPChem’s company premises, contractor shall notify the local company facility manager.

--END--
Safety Policy

These requirements cover all personnel at any installation including:

- CPChem employees
- contractors or
- visitors.

Safety requirements vary depending on operational conditions.

Inspection companies must review and comply with the safety requirements at the installations in which they work, including facility safety orientations.

Requirements

Minimum requirements state that inspector/surveyors wear:

- hard hat
- safety glasses
- long sleeves (fire retardant)
- long pants (fire retardant)
- substantial footwear
- suitable protective clothing for handling the product being inspected.
- U. S. Coast Guard (USGS) approved personal floatation device (PFD)
- photo identification issued by the employing company
- company name on Fire retardant clothing

Benzene Inspection Safety Requirements

Each inspection company will monitor employees to ensure proper personal protection equipment is worn while working near benzene.

Benzene inspections require additional personal protective equipment including:

- full face piece chemical cartridge respirator
- organic vapor cartridges or organic vapor canister
- benzene resistant slicker suit, boots and gloves.

STATIC ELECTRICITY HAZARDS MAY EXIST.
Preventative measures should be followed to avoid ignitions from static discharges. Please refer to American Petroleum Institute Recommended Practice 2003 for more detailed information.

NOTE: This stop sign symbol has been placed throughout the procedures in this manual to indicate where static electricity precautions must be applied.

--END--
Product Transfer Inspection Manual

Purpose
Outline the inspection manual’s objective and scope.

Objective
This manual outlines the minimum requirements for quantity and/or quality inspections performed for CPChem. This includes all of its divisions, subsidiaries and joint ventures unless superceded by local instructions. These guidelines apply whether an inspection company is appointed solely or on a joint basis with one or more other companies.

IF additional instructions are necessary, THEN they will be itemized in the job nomination “Shipping Request/Job Nomination” via fax or e-mail.

Responsibilities of the inspector/surveyor
Each inspector/surveyor must:
- read and understand these instructions
- use the instructions as a guide for inspections

Scope
In addition to the inspections described in this manual, inspection companies may be requested to perform:
- investigations in the event of stock loss
- shore tank inspections
- annual physical inventories.

Instructions for these procedures are not included in this manual.

IF there are any questions or concerns regarding the inspection or these instructions, THEN call the CPChem Customer Account Coordinator (CAC), or Petrochemical Logistics.

--END--
PRE-INSPECTION PROCEDURES

Chapter Overview
This chapter covers the general requirements of pre-inspecting barges, vessels, and shore tanks

In this Chapter

PINS 01: Barge pre-inspection at shipyard or cleaning facility .................................................. 18

--END--
PINS 01: Barge pre-inspection at shipyard or cleaning facility

Purpose

This document addresses barges entering CPChem service either as a newly constructed unit or having just emerged from a shipyard or cleaning facility. The purpose of this procedure is to reduce the risk of contamination due to residues from the fabrication, cleaning, or repair process.

Required Forms

- Certificate of Vessel or Tank Cleanliness

7-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check in as instructed in Procedure INS 01</td>
</tr>
<tr>
<td>2</td>
<td>Perform a deck level inspection as instructed in paragraph 8 of the API “Manual of Petroleum Measurement Standards Chapter 17 – Marine Measurement; Section 8 – Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks”&lt;br&gt;<strong>IF … THEN…</strong>&lt;br&gt;all the tanks are acceptable per the API guideline: deck level pre-inspection is approved&lt;br&gt;any of the tanks are not acceptable per the API guideline: deck level pre-inspection is not approved; notify the CAC or Chevron Shipping contact (the barge may be washed or rejected)</td>
</tr>
<tr>
<td>3</td>
<td>Witness blowing all the lines from the header into all the compartments.&lt;br&gt;<strong>IF … THEN…</strong>&lt;br&gt;no liquid or solid material blown into the tanks: blow down pre-inspection is approved&lt;br&gt;liquid or solid material visible when the blow down is performed: blow down pre-inspection is not approved; notify the CAC or Chevron Shipping contact (the barge may be washed or rejected)</td>
</tr>
<tr>
<td>4</td>
<td>If instructed to perform a Wall Wash, <strong>THEN</strong> perform a Wall Wash per Procedure B of the API standard cited above. The CAC or Chevron Shipping contact will instruct whether Wall Wash will be Funnel Wall Wash (using Methanol or designated wash liquid), Blotter Wall Wash or both.</td>
</tr>
</tbody>
</table>
### Page 2 of PINS 01: Barge Pre-inspection at shipyard or cleaning facility

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Label Wall Wash samples and deliver to the designated laboratory for analysis.</td>
</tr>
<tr>
<td></td>
<td><strong>IF ...</strong></td>
</tr>
<tr>
<td></td>
<td>). the tanks are acceptable per the Wall Wash test results</td>
</tr>
<tr>
<td></td>
<td>the tanks are not acceptable based on Wall Wash sample testing</td>
</tr>
<tr>
<td>6</td>
<td><strong>IF</strong> instructed to perform a tank entry inspection, <strong>THEN</strong> perform a tank entry inspection as instructed in paragraph 9 of the API standard cited above.</td>
</tr>
<tr>
<td></td>
<td><strong>IF ...</strong></td>
</tr>
<tr>
<td></td>
<td>). the tanks are acceptable per the API guideline and more than 95% of the liner (if applicable) is intact</td>
</tr>
<tr>
<td></td>
<td>the tanks are not acceptable per the API guideline OR less than 95% of the liner (if applicable) is intact</td>
</tr>
<tr>
<td>7</td>
<td>Complete the Inspection Report and submit to the CAC or Chevron Shipping contact.</td>
</tr>
</tbody>
</table>

--END--
Administrative Procedures

Chapter Overview

This chapter covers the general requirements of any inspection, including checking-in for the inspection, completing the final documentation, and invoicing.

In this Chapter

Prior to Inspection

INS 01: Checking in for the Inspection

After Inspection

INS 02: Troubleshooting when the Variance Is Greater than 0.3%
INS 03: Completing the Final Documentation
INS 04: Invoicing

--END--
Prior to Inspection

INS 01: Checking in for the Inspection

Purpose
Describe the inspector/surveyor’s responsibility upon arrival to perform the inspection.

Required Forms
- Shipping Request or Job Nomination Form

5-Step Procedure
Note: The dispatcher and the terminal will coordinate the timing of the inspection. The inspector/surveyor uses this procedure to check in on the day of the inspection.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is the Order written or verbal?</td>
</tr>
<tr>
<td></td>
<td><strong>IF the Order is…</strong></td>
</tr>
<tr>
<td></td>
<td>written</td>
</tr>
<tr>
<td></td>
<td>verbal</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>verbal</td>
</tr>
<tr>
<td>2</td>
<td>Check the job nomination form to verify whether you are to inspect for:</td>
</tr>
<tr>
<td></td>
<td>• quantity</td>
</tr>
<tr>
<td></td>
<td>• quality</td>
</tr>
<tr>
<td></td>
<td>• vessel suitability</td>
</tr>
<tr>
<td></td>
<td>• all of the above.</td>
</tr>
<tr>
<td>3</td>
<td>From the inspection company office, collect:</td>
</tr>
<tr>
<td></td>
<td>• a completed shipping request and/or job nomination form outlining the requirements for the inspection</td>
</tr>
<tr>
<td></td>
<td>• Material Safety Data Sheet(s)</td>
</tr>
<tr>
<td></td>
<td>• any other pertinent documents.</td>
</tr>
<tr>
<td>4</td>
<td>At the terminal:</td>
</tr>
<tr>
<td></td>
<td>• check in at the main gate on time with proper identification (See Safety, pg. 17)</td>
</tr>
<tr>
<td></td>
<td>• contact dock or shift supervisor.</td>
</tr>
</tbody>
</table>
### Checking in for the inspection

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 5    | Join dock/shift supervisor and the person in charge of the vessel for a pre-transfer conference to verify:  
  - transfer loading rate  
  - capacity limitations  
  - minimum/maximum quantity of cargo to be transferred  
  - MSDS information  
  - sampling requirements  
  - cleaning history  
  - last three cargoes  
  - special requests by customers. |

---

**END**
After Inspection

INS 02: Troubleshooting When the Variance is Greater than 0.3%

Purpose
This document outlines the procedure for rechecking variances in net volume transferred during loading or discharge operations.

Required Forms
- Letter of Protest (if applicable)
- Letter of Discrepancy (if applicable)
- Vessel Experience Factor (VEF) Calculation Report

8-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manually regauge and check the temperature of the shore and vessel cargo tanks.</td>
</tr>
<tr>
<td>2</td>
<td>Check line displacement figures.</td>
</tr>
<tr>
<td>3</td>
<td>Compare difference between hand gauge and auto gauge readings at open and close.</td>
</tr>
</tbody>
</table>
| 4    | **IF** the transfer was a discharge from vessel to shore tank, **THEN**
  | • check amount of material left in the vessel cargo tank(s)
  | • check CPChem’s shore figures against load port figures. |
| 5    | Recheck line condition at closing tank gauge. |
| 6    | Check:
  | • vessel experience factor (VEF)
  | • inventory changes in other tanks connected to the same piping system. |
| 7    | Compare vessel figures at load port versus arrival figures at discharge port, and compare shore figures between load and discharge port. |
| 8    | **IF recalculated quantities vary by…**  **THEN…**
  | less than 0.3%,
  | begin filing the documentation as specified in *INS 03: Completing Final Documentation*.
  | more than 0.3%,
  | • issue a letter of protest to the facility and person in charge of the vessel **before** the vessel departs. Issue a *Letter of Discrepancy* to document the variance.
  | • Notify the CAC. |

-- END --
INS 03: Completing the Final Documentation

Purpose
Describe the development of the final inspection report. The document:
- lists required forms
- clarifies the deadline for filing
- gives instructions for distributing.

Required Forms
Descriptions of required forms are available in the Document References section of this Inspection Manual.

Filing the Reports
The following chart outlines the required documentation and filing deadlines.

<table>
<thead>
<tr>
<th>Report</th>
<th>Required forms</th>
<th>Filing instructions</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross standard volume reconciliation</td>
<td>Draft of the Inspection Report</td>
<td>Deliver to the vessel</td>
<td>Prior to the vessel departure</td>
</tr>
<tr>
<td>24 Hour Notification</td>
<td>• Final gross and net standard volume reconciliation • Statement of Facts</td>
<td>Fax or Email to the CPChem representative specified on the shipping request/job nomination form.</td>
<td>Within 24 hours of vessel departure</td>
</tr>
<tr>
<td>Final inspection report</td>
<td>• Company Certificate of Analysis • Letters of Protest (if any) • Certificate of Line Condition • Certificate of Analysis • Certificate of Shore Quantities • Certificate of Vessel Cleanliness • Certificate of Vessel Quantities • Distribution of Retain Samples • Letter of Discrepancy (if any) • Reconciliation Report • Summary Report • Statement of Facts • Shore/Vessel Seal Report • Vessel Experience Factor Report</td>
<td>1. Send copies via e-mail or fax to CPChem as instructed by shipping request/job nomination form. (See INS 04: Invoicing.) 2. Send one copy to the terminal or facility where the inspection occurred. 3. IF U.S. Customs is involved with the inspection, THEN send two copies of the report to the freight forwarder designated in the shipping request/job nomination instructions.</td>
<td>Within 24 hours of vessel departure (or 72 hours if a holiday or weekend intervenes)</td>
</tr>
</tbody>
</table>

-- END --
INS 04: Invoicing

Purpose
This document specifies the procedure for preparing and distributing the invoice.

Required Forms
- Original invoice

3-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1    | Prepare the invoice, including:  
|      | • name of vessel, tank number or pipeline  
|      | • name and quantity of product  
|      | • location and date of movement  
|      | • CPChem order number  
|      | • full name of the shipping and receiving company(s).  
| 2    | Itemize the inspection services at the rates agreed to in the latest CPChem contract.  
|      | The cost of inspection services, unless otherwise agreed, will be as published in the inspection company’s latest price list.  
| 3    | Send the original invoice to Accounts Payable (Attention CAC that placed the order, Chevron Phillips Chemical Company, PO Box 4920, The Woodlands, TX 77387-4920) and copy the CAC, unless otherwise designated.  

-- END --
INSPECTION PROCEDURES FOR TRANSFERS FROM SHORE TO VESSEL

Chapter Overview
This chapter outlines the inspector/surveyor's responsibilities for inspections before, during and after loading.

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--END--
Prior to the Transfer from Shore

INS 05: Inspecting Receiving Tanks and Transfer Piping for Suitability

Purpose
Describe the procedure for inspecting receiving tanks for suitability. This procedure applies to:
- ships
- barges
- shore tanks
- deck tanks

Required Forms
- Certificate of Vessel or Tank Cleanliness

Responsibilities
Inspectors/surveyors are responsible for verifying that the vessel owners have satisfactorily cleaned their tanks and record the cleaning method using the Visual Tank Inspection Report.

Piping inspection should include a visual check for evidence of external leakage and for residue inside the piping. Internal inspection should be made from all practical locations such as; manifold piping, blinds and flanges.

Inspectors/surveyors will inspect every vessel for suitability before loading regardless of whether the vessel/barge owners requested a pre-loading inspection at their last discharge port or shipyard. ,

IF tanks and/or piping are not suitable, THEN the inspector/surveyor should notify the CAC with his/her recommendations.

Note: The CAC ensures that the appropriate recommendations are carried out.

Time Specifications
The inspector/surveyor must perform the suitability inspection early enough to minimize delays associated with any required additional cleaning.
### 10-Step Procedure

**Page 2 of INS 05: Inspecting Receiving Tanks and Transfer Piping for Suitability**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1    | Examine the receiving tank(s) and associated piping for leaks, residue and corrosion.  

<table>
<thead>
<tr>
<th>IF there is...</th>
<th>THEN...</th>
</tr>
</thead>
<tbody>
<tr>
<td>a leak,</td>
<td>Reject the vessel and inform the CAC.</td>
</tr>
</tbody>
</table>
| evidence of corrosion, | Record on the Certificate of Vessel Cleanliness:  
|                 | • the quantity of rust  
|                 | • its potential impact on the product  
|                 | • type (scale or powder).  
|                 | And inform the CAC |
| scale in the tank, | Determine compatibility with the product to be loaded and inform the CAC. |

| 2    | Examine the receiving tank(s) to ensure:  
|      | • all bilges have been blanked off and sealed  
|      | • the tank uses double valve separation  
|      | • the tank uses a dedicated pipe system  
|      | • the compatibility of products within a single cargo piping system. |

| 3    | Check the receiving tank(s) and piping for:  
|      | • free water or condensation  
|      | • coatings or linings  
|      | • visible evidence of polymer build-up  
|      | • traces of previous cargoes.  

<table>
<thead>
<tr>
<th>IF the tank and/or piping...</th>
<th>THEN...</th>
</tr>
</thead>
</table>
| is coated or lined,          | examine the coating or lining for  
|                             | • type  
|                             | • condition (must be at least 95% intact to be acceptable) |
| contains traces of previous cargoes, | test traces for compatibility with the product to be loaded. |
| contains visible evidence of polymer | the tank unsuitable. |
### Step 4: Inspecting Receiving Tanks and Transfer Piping for Suitability

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 4    | For each receiving tank to be loaded, record:  
|      | - last three cargoes  
|      | - cleaning procedures used after each of the last three cargoes  
|      | - capacity of each tank  
|      | - vessel load plan for the current voyage  
|      | - product currently stored in adjacent tanks and pipelines where a mixture could occur. |

5 If instructed to perform a Wall Wash, then do so according to Procedure B of the API “Manual of Petroleum Measurement Standards Chapter 17 – Marine Measurement; Section 8 – Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks.” The CAC will instruct whether Wall Wash will be a Funnel Wall Wash (using Methanol or designated wash liquid), Blotter Wall Wash or both.

6 Label Wall Wash samples and deliver to the designated laboratory for analysis.

<table>
<thead>
<tr>
<th>IF…</th>
<th>THEN…</th>
</tr>
</thead>
<tbody>
<tr>
<td>the tanks are acceptable per the Wall Wash test results</td>
<td>Tanks are approved; notify the CAC</td>
</tr>
<tr>
<td>the tanks are not acceptable based on Wall Wash sample testing</td>
<td>Tanks not approved; notify the CAC (the vessel may be washed or rejected)</td>
</tr>
</tbody>
</table>

7 After determining suitability:

<table>
<thead>
<tr>
<th>IF…</th>
<th>THEN…</th>
</tr>
</thead>
<tbody>
<tr>
<td>the tank(s) and/or piping is/are unsuitable,</td>
<td>Reject the receiving tank(s) and call the CAC immediately with recommendations.</td>
</tr>
<tr>
<td>the tank(s) is/are suitable,</td>
<td>Complete the Certificate of Vessel Cleanliness.</td>
</tr>
</tbody>
</table>

8 Manually gauge tanks and record ullage.

9 Record temperature of and sample any OBQ product in tank to be loaded on top.

10 Record vessel draft and calculate trim (if applicable)

-- END --
INS 06: Rejecting Receiving Tanks/Piping

Purpose
This outlines the procedure when rejecting a receiving tank/piping.

2-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Notify CAC with recommendations for making the receiving tank/piping suitable for use.</td>
</tr>
<tr>
<td>2</td>
<td>IF the vessel returns for loading after cleaning, THEN reinspect for suitability as described in <em>INS 05: Inspecting Receiving Tanks and Piping for Suitability</em>.</td>
</tr>
</tbody>
</table>

-- END --
INS 07: Verifying the Shore Tank Contents Before Loading

Purpose
Outline the procedure for gauging, sampling, and recording the contents of the shore tanks before loading a suitable barge or vessel.

Required Forms
- Certificate of Line Condition
- Certificate of Shore Quantities
- Ullage Report
- Certificate of Analysis

Policy
An authorized terminal representative must witness this procedure.

Time Specifications
Begin the inspection at least one hour before the vessel is expected to arrive to minimize vessel turn around time.

6-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check the most recent Certificate of Analysis of the shore tank.</td>
</tr>
<tr>
<td>2</td>
<td>From each shore tank involved in the transfer, take average temperatures, water cuts and meter readings, if a custody transfer meter is used. (See the definition of &quot;average temperatures&quot; in the Glossary for more information). STOP</td>
</tr>
<tr>
<td>3</td>
<td>Record all information on the ullage report.</td>
</tr>
<tr>
<td>4</td>
<td>Gauge each shore tank and record the following:</td>
</tr>
<tr>
<td></td>
<td>• innage</td>
</tr>
<tr>
<td></td>
<td>• calculated innage using the tank height stated on the strapping tables</td>
</tr>
<tr>
<td></td>
<td>• difference between the innage and the calculated innage</td>
</tr>
<tr>
<td></td>
<td>• difference between the actual gauge height and the strapping tables gauge height.</td>
</tr>
<tr>
<td></td>
<td>Note: Calculated innage must be used for all custody transfer calculations.</td>
</tr>
<tr>
<td>5</td>
<td>Take, label, test, and retain running samples as described in INS 11: Collecting the Samples before Loading.</td>
</tr>
<tr>
<td>6</td>
<td>Verify whether the shore line is empty or full by using the procedure in INS 08: Verifying the Shore Line Condition.</td>
</tr>
</tbody>
</table>

-- END --
INS 08: Verifying the Shore Line Condition

Purpose
This describes the procedure for checking the condition of the shore line and determining its contents before loading.

Required Forms
- Certificate of Line Condition

5-Step Procedure
Note: Use of pigging systems may improve accuracy where available.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1    | Verify which shore line will be used in the transfer with one or more of the following:  
|      | • plant representative  
|      | • terminal representative  
|      | • refinery representative. |
| 2    | Determine whether the shore line is dedicated and/or isolated. |
| 3    | Ensure that the shore line is empty or full, using one of the following two methods.  
|      | **Method 1**  
|      | Circulate the capacity of the line back to the shore tank.  
|      | **Method 2**  
|      | 1. Pump 1.5 times the volume of the shore line.  
|      | 2. Shut down.  
|      | 3. Gauge:  
|      | • shore tank  
|      | • vessel tank.  
|      | 4. Calculate the net difference.  
|      | Note: **Method 2 is conducted at the start of a cargo transfer.** |
| 4    | Use the Certificate of Line Condition to record gauge calculations, method and shore line capacity. |
| 5    | For all adjacent tanks and tanks on the same line where a mixture could occur, note:  
|      | • type of product  
|      | • ullage  
|      | • temperature  
|      | • quantity. |

-- END --
INS 09: Taking Samples Before Loading

**Purpose**

Identify the points for taking retain and test samples before loading.

**Time Specifications**

The following samples must be taken before loading can begin.

**STATIC ELECTRICITY HAZARDS MAY EXIST.**
Preventative measures should be followed to avoid ignitions from static discharges

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Quantity</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shore tanks</td>
<td>retain sample</td>
<td>one quart, or as requested</td>
<td>within 8 hours of loading.</td>
</tr>
<tr>
<td></td>
<td>test sample</td>
<td>one quart, or as requested</td>
<td>within 24 hours of vessel’s arrival</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The Certificate of Analysis is valid for as long as the tank remains static, unless otherwise instructed.</td>
</tr>
<tr>
<td>Shore line manifold</td>
<td>test sample</td>
<td>one quart, or as requested</td>
<td>within 24 hours of vessel’s arrival</td>
</tr>
<tr>
<td>If the shore line is a Shared line with other products</td>
<td></td>
<td></td>
<td>The Certificate of Analysis is valid for as long as the tank and shore line remains static, unless otherwise instructed.</td>
</tr>
<tr>
<td>Shore line manifold</td>
<td>retain sample</td>
<td>one quart, or as requested</td>
<td>prior to opening shore manifold valve.</td>
</tr>
<tr>
<td>If the shore line is Dedicated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vessel manifold</td>
<td>retain sample</td>
<td>one quart, or as requested</td>
<td>prior to opening vessel’s manifold valve.</td>
</tr>
</tbody>
</table>

**Collecting Samples**

Use the procedure in *INS 10: Collecting Samples*.

-- END --
INS 10: Collecting Samples

Purpose
This describes the general procedure for collecting samples during an inspection.

Policy
The inspector/surveyor must personally verify that the samples are collected in accordance with the instructions stated in the nomination fax/e-mail for CPChem, as well as for CPChem’s customers, suppliers and/or exchange partners.

Required Forms
- Distribution of Retain Samples
- Statement of Facts
- 24 hour Notification
- Job Nomination Form
- Chain of Custody Form

CAUTION: When transporting product samples on public roads, inspectors/surveyors must comply with all appropriate U S Department of Transportation or other local regulations.

STATIC ELECTRICITY HAZARDS MAY EXIST. Preventative measures should be followed to avoid ignitions from static discharges

11-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fill the bottle. See note “*” for type bottle to be used.</td>
</tr>
<tr>
<td>2</td>
<td>Close the cap and secure it.</td>
</tr>
<tr>
<td>3</td>
<td>Place a plastic bag over the bottle, and apply the custody seals.</td>
</tr>
</tbody>
</table>
| 4    | Document and label the samples with following information, as applies:  
  - date obtained  
  - vessel/tank facility designation obtained from  
  - product  
  - seal numbers  
  - amount of sample  
  - disposal company  
  - tracking number  
  - disposal date  
  - type of disposal. |
**Page 2 of INS 10: Collecting Samples**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>IF the sample is a...</strong> <strong>THEN ...</strong></td>
</tr>
<tr>
<td></td>
<td>test sample</td>
</tr>
<tr>
<td></td>
<td>retain sample</td>
</tr>
</tbody>
</table>
| **6** | Visually examine the samples for:  
  - water  
  - color  
  - appearance  
  - sediment. |
| **7** | Send the samples for testing. Have the lab test all level running samples as outlined in the shipping request/job nomination. |
| **8** | **IF the test results...** **THEN ...** |
| | do not meet the specifications as stated by:  
  - the job nomination fax/e-mail  
  - CPChem representative |  
  - call the CAC immediately  
  Note: Discuss all differences in the test results from the stated specifications. |
| | meet the specifications | Go to step 9. |
| **9** | Retain one-quart samples for 90 days. |
| | **IF ...** **THEN ...** |
| | the CPChem facility cannot retain the samples, |  
  - retain the samples for 90 days  
  - inform CPChem where the samples are stored. |
| | the sample is benzene, | tape, seal and retain for 90 days at the transfer facility. |
| | the sample is cumene or styrene, | Store under refrigeration for the specified retention period. |

* - Glass bottles are to be new, clear, clean, and dry, inside and out, for visual inspections and laboratory testing. **Exception:** for Styrene sampling and testing, amber-type bottles are to be used for laboratory testing and clear bottles to be used for visual testing only. Amber-type bottles will reduce the degradation of the TBC inhibitor should further testing be required. Caps shall be Teflon® lined.
### Page 3 of INS 10: Collecting Samples

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Distribute any other retain samples in accordance with the shipping request/job nomination form.</td>
</tr>
</tbody>
</table>
| 11   | Submit the following to the CAC:  
  - results of the analysis  
  - sample receipts for retain and tested samples, signed by any of the following:  
    - terminal representative  
    - the inspector/surveyor  
    - vessel person in charge (PIC). |

--END--
During the Transfer from Shore to the Vessel

INS 11: Inspecting During Loading

Purpose

This procedure outlines the requirements for inspections during loading including:

- collecting and analyzing first-in samples
- gauging tanks
- collecting and analyzing final cargo tank samples.

Required Forms

- Shipping Request and/or Job Nomination Form

**STATIC ELECTRICITY HAZARDS MAY EXIST.** Preventative measures should be followed to avoid ignitions from static discharges

10-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Witness loading, as instructed by the CAC in the Job Nomination form, the following:</td>
</tr>
<tr>
<td></td>
<td>IF …</td>
</tr>
<tr>
<td></td>
<td>Heel in one barge compartment</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heel in all barge compartments</td>
</tr>
<tr>
<td></td>
<td>Heel in all ship’s tanks</td>
</tr>
<tr>
<td>2</td>
<td><strong>Observe the 30-minute relaxation period, THEN</strong> draw two samples, per shipping request/job nomination instructions, from each of the vessel cargo tanks.</td>
</tr>
<tr>
<td>3</td>
<td><strong>Follow the procedure in INS 10: Collecting Samples</strong> to collect, label, and send the samples for testing.</td>
</tr>
<tr>
<td>4</td>
<td>Manually gauge and take the temperature of the one-foot heel.</td>
</tr>
<tr>
<td>5</td>
<td>Manually gauge and take the temperature of the shore tank.</td>
</tr>
<tr>
<td>6</td>
<td>Calculate the line verification using the procedure in <strong>INS 08: Verifying the Shore Line Condition</strong>.</td>
</tr>
</tbody>
</table>
**Page 2 of INS 11: Inspecting During Loading**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7</strong></td>
<td>Review the first-in sample analysis.</td>
</tr>
<tr>
<td></td>
<td><strong>IF product…</strong></td>
</tr>
<tr>
<td></td>
<td>meets specifications,</td>
</tr>
<tr>
<td></td>
<td>does not meet specifications,</td>
</tr>
<tr>
<td><strong>8</strong></td>
<td>Load the quantity of product specified on the Shipment Request/Job Nomination from the CAC.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> The Master of the vessel is not authorized to change quantities to be loaded.</td>
</tr>
<tr>
<td><strong>9</strong></td>
<td><strong>STOP</strong></td>
</tr>
<tr>
<td><strong>10</strong></td>
<td>Have the samples analyzed as instructed on Shipment Request/Job Nomination form or per standing orders.</td>
</tr>
</tbody>
</table>
INS 12: Collecting Samples During Tank-to-Tank Transfers

Purpose
This outlines the procedure for taking retain and test samples during tank-to-tank transfers.

Required Forms
- Certificate of Analysis

Time Specifications
Inspector/surveyors must draw retain and test samples before transfer begins.

**STATIC ELECTRICITY HAZARDS MAY EXIST.**
Preventative measures should be followed to avoid ignitions from static discharges

Inspector/surveyors will use the following procedure to sample tanks for a tank-to-tank transfer.

5-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Draw the following samples using the procedure in <em>INS 10: Collecting Samples</em>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>delivery tank</td>
<td>running sample</td>
<td>1 sample (2 quarts)</td>
</tr>
<tr>
<td>point on line nearest the</td>
<td>line sample</td>
<td>2 samples (1 quart each, or as requested)</td>
</tr>
<tr>
<td>receiving tank</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IF the receiving tank ...</th>
<th>THEN...</th>
</tr>
</thead>
</table>
| is empty,                | • transfer a three-foot heel into the receiving tank and then **STOP** the transfer  
|                          | • draw a 2-quart running sample from the receiving tank using the procedure in *INS 10: Collecting Samples*. |
| contains product,        | draw a 2-quart running sample from the receiving tank using the procedure in *INS 10: Collecting Samples*. |
### Page 2 of INS 12: Collecting Samples during Tank-to-Tank Transfers

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Analyze one container of the sample.</td>
</tr>
<tr>
<td></td>
<td><strong>IF product…</strong></td>
</tr>
<tr>
<td></td>
<td>meets specifications,</td>
</tr>
<tr>
<td></td>
<td>does not meet specifications,</td>
</tr>
<tr>
<td>4</td>
<td>Include the results of the analysis in the <em>Certificate of Analysis</em>.</td>
</tr>
<tr>
<td>5</td>
<td>Seal and store retain samples as instructed in <em>INS 10: Collecting Samples</em>.</td>
</tr>
</tbody>
</table>

-- END --
INS 13: Monitoring Transfers with a Running Gauge (Live Tank)

Purpose

This document describes:
• consequences of transferring product based on a running gauge
• how to monitor a transfer using a running gauge, if operating circumstances require the use of the running gauge.

Required Forms

• Certificate of Shore Quantities
• Vessel Experience Factor Report (VEF)

Consequences of Transferring Product Based on a Running Gauge

Measuring transfers with a running gauge generally means that shore tank quantities cannot be calculated accurately. Inspector/surveyors should avoid using running gauges whenever possible.

Inspector/surveyors should use the following procedure when monitoring transfers using a running gauge.

7-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Call the CPChem CAC for instructions.</td>
</tr>
<tr>
<td>2</td>
<td>Compile a vessel experience factor based on information supplied by the vessel on the VEF Report. Include this form in the inspection report. <strong>IF</strong> this information is <strong>not</strong> available, <strong>THEN</strong> note this on the inspection report.</td>
</tr>
<tr>
<td>3</td>
<td>Use the vessel’s loaded gauge figures to calculate the transfer quantities and set a stop gauge on the vessel tank(s). <strong>Note:</strong> <strong>Do not</strong> adjust the load figures to account for the vessel’s historical experience factor.</td>
</tr>
<tr>
<td>4</td>
<td>Record meter readings when a meter is used.</td>
</tr>
<tr>
<td>5</td>
<td>Communicate hourly rate to shore tank.</td>
</tr>
<tr>
<td>6</td>
<td>Include the <em>Certificate of Shore Quantities</em> in the final inspection report for reference purposes only.</td>
</tr>
<tr>
<td>7</td>
<td>Note in the final report that running gauges were used.</td>
</tr>
</tbody>
</table>

-- END --
INS 14: Accommodating Other Transfers during Vessel Operations

Purpose
This describes how to accommodate other transfers to/from rail cars, tank trucks or other containers during loading or discharge operations.

Policy
Simultaneous transfers to/from rail cars, tank trucks or other containers, made from a shore line or shore tank during the ongoing movement of product to/from a vessel using a common pipeline, IS PROHIBITED.

IF a transfer to/from a tank truck/rail car or other container must occur during an ongoing operation, the ongoing operation MUST BE TEMPORARILY SHUT DOWN until the interceding transfer is COMPLETED. Only then can the original operation be resumed.

Conducting such an interceding transfer must be done only in accordance with written instructions from the CAC.

Use the following procedure to conduct and monitor these transfers.

6-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shut down the ongoing transfer operation.</td>
</tr>
<tr>
<td>2</td>
<td>Gauge the shore tank and the vessel tank(s) and record the results.</td>
</tr>
<tr>
<td>3</td>
<td>Proceed with loading the tank truck/rail car or other container using the procedure INS 15: Transferring to Tank Trucks and Rail Cars.</td>
</tr>
<tr>
<td>4</td>
<td>When the tank truck/rail car transfer is complete:</td>
</tr>
<tr>
<td></td>
<td>• gauge the shore tank and the vessel tank(s) again</td>
</tr>
<tr>
<td></td>
<td>• use weigh bridge weights to confirm and/or reconcile quantities transferred.</td>
</tr>
<tr>
<td>5</td>
<td>Check shore pipelines after the transfer to determine whether they are empty or full. Account for this in the inspection.</td>
</tr>
<tr>
<td>6</td>
<td>Resume the previously interrupted operation.</td>
</tr>
</tbody>
</table>

-- END --
INS 15: Transferring to Tank Trucks and Railcars

Purpose
This discusses the procedure for monitoring a transfer into tank trucks and railcars.

Required Forms
- Certificate of Vessel Cleanliness (for each tank truck and railcar)
- Scale Tickets

4-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inspect each tank truck or railcar for suitability as described in <em>INS 05: Inspecting Receiving Tanks for Suitability</em>.</td>
</tr>
</tbody>
</table>
| 2    | For each tank truck or railcar, include in the report:  
|      | • Certificate of Vessel Cleanliness  
|      | • truck and trailer or railcar identification  
|      | • truck destination. |
| 3    | Load the truck or railcar. |
| 4    | Note the following information:  
|      | • reasons for any delay in the loading process  
|      | • tare weight  
|      | • time hose on  
|      | • time hose off  
|      | • gross weight  
|      | • net weight  
|      | • copies of scale tickets for each truck. |

-- END --
After the Transfer to the Vessel

INS 16: Verifying the Delivery from the Shore Tanks to the Vessel

Purpose

This outlines the procedure for gauging, sampling, and recording the contents of the shore tanks after loading a suitable barge or vessel.

Required Forms

- Shipping Request and/or Job Nomination Form
- Certificate of Line Condition
- Certificate of Shore Quantities
- Summary Report
- Shore Tank Ullage Report

6-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1    | Record the following in the ullage report for each shore tank involved in the transfer:  
|      | • closing gauges  
|      | • average temperatures  
|      | • water cuts. |
| 2    | Determine quantity in shore tank(s). |
| 3    | Verify whether the shore line is empty or full by using the procedure in INS 08:  
|      | Verifying the Shore Line Condition. |
| 4    | Calculate gross standard volume delivered based on the quantity remaining in the  
|      | shore tanks and shore line. |
| 5    | Witness or perform any testing as instructed in the job nomination form. |
| 6    | Record all findings in the inspection report. |

-- END --
INS 17: Verifying the Product Loaded into the Vessel Cargo Tanks

Purpose
This document outlines the procedure for gauging, sampling, and recording the contents of the vessel cargo tanks after loading.

Required Forms
- Certificate of Vessel Quantities
- Ullage Report

7-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Record draft.</td>
</tr>
</tbody>
</table>
| 2    | From all tanks loaded, record:  

- innate/ullage  
- water cuts  
- average temperatures. |
| 3    | Draw and label running sample from each vessel tank containing the designated product using the procedure in INS 10: Collecting Samples. |
| 4    | Regauge any adjacent tanks or tanks on the same line containing the product. |
| 5    | Record in the ullage report any factors that affect accurate measurement. These factors include, but are not limited to:  

- inconsistencies in the vessel’s calibration tables  
- obstructions in the tank preventing a gauge from touching bottom. |
| 6    | • Apply seals to all compartment manways, lids, gauge openings, and flanged connections.  

• Record seal number and seal location and report accordingly ton the Shore/Vessel Seal Report (page xx) |
| 7    | Calculate and record in the inspection report:  

- gross standard volume received  
- gross standard volume received with trim correction  
- net standard volume received  
- net standard volume received with trim correction. |

-- END --
INS 18: Reconciling Net Volumes Transferred from Shore to Vessel after Loading

Purpose
This document outlines the procedure for reconciling and reporting the net volumes transferred from shore to vessel after loading.

Required Forms
- Reconciliation Report
- Letter of Protest (if applicable)
- Letter of Discrepancy (if applicable)

3-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compare the shore quantity calculated in <strong>INS 16: Verifying the Delivery from the Shore Tanks to the Vessel</strong> with the ship’s cargo quantity calculated in <strong>INS 17: Verifying the Product Loaded into the Vessel Cargo Tanks</strong>.</td>
</tr>
</tbody>
</table>
| 2    | Reconcile net volumes between the shore tank and barge/vessel tank(s) using API or other acceptable standards.  

**IF the variance exceeds 0.3%... THEN...**

<table>
<thead>
<tr>
<th>BEFORE</th>
<th>AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>After the initial reconciliation,</td>
<td>Reconfirm gauges and volumes using the procedure in <strong>INS 02: Troubleshooting when the Variance is Greater than 0.3%</strong>.</td>
</tr>
<tr>
<td>After reconfirmation of figures,</td>
<td>Issue a <strong>Letter of Discrepancy</strong> to the facility and person in charge of the vessel <strong>before</strong> the vessel departs.</td>
</tr>
<tr>
<td>3</td>
<td>When the quantity is confirmed, complete the documentation as specified in <strong>INS 03: Completing Final Documentation</strong>.</td>
</tr>
</tbody>
</table>

-- END --
INS 19: Ballast Operations

Purpose
This document describes the inspector/surveyor’s responsibility in ballast operations.

Required Forms
- Inspection Report
- Shore/Vessel Seal Report

Responsibilities
The inspector/surveyor must not sign any certificate acknowledging or giving permission to commence ballast operations.

2-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>For vessels that do not have a segregated ballast system, seal the sea suction valves.</td>
</tr>
<tr>
<td>2</td>
<td>Record the seal number(s) on the Shore/Vessel Seal Report.</td>
</tr>
</tbody>
</table>

-- END --
INSPECTION PROCEDURES FOR DISCHARGING FROM VESSEL TO SHORE

Chapter Overview
This chapter outlines the inspector/surveyors responsibilities for inspections during discharge operations.

In this Chapter

Prior to Discharge
INS 20: Verifying Shore Tank Contents before Discharge .................................................. 49
INS 21: Verifying Vessel Tank Contents before Discharge .................................................. 51

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After Discharging to the Shore
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INS 24: Completing the Remaining On-Board Inspections .............................................. 55
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--END--
Prior to Discharge

INS 20: Verifying Shore Tank Contents Before Discharge

Purpose
This outlines the procedure for verifying the contents of the receiving shore tank(s) and shore lines before discharging into them.

Required Forms
- Certificate of Shore Quantities
- Summary Report
- Shore Tank Ullage report

Time Specifications
To minimize vessel turn around time, the inspector/surveyor will begin this procedure at least one hour before the vessel is due at the dock.

IF the product is an import, THEN the inspector/surveyor must schedule gauging of shore tanks to coincide with the timing established by the U.S. Customs Inspector/Surveyor.

STATIC ELECTRICITY HAZARDS MAY EXIST.
Preventative measures should be followed to avoid ignitions from static discharges

5-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>From each shore tank involved in the transfer, take average temperatures and water cuts. (See &quot;average temperatures&quot; in the Glossary).</td>
</tr>
<tr>
<td>2</td>
<td>If an auto gauge is used, record auto gauge readings in the appropriate section of the shore tank ullage report.</td>
</tr>
</tbody>
</table>
| 3    | Take opening gauges and record the following for each shore tank:  
  - Innage  
  - Calculated innage using the tank height stated on the strapping tables  
  - Difference between the innage and the calculated innage  
  - Difference between the actual gauge height and the strapping tables gauge height.  
  Note: Calculated innage must be used for all custody transfer calculations. |
<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><strong>Draw and test the following samples using the procedures in</strong> <em>INS 09: Taking Samples Before Loading</em> and <em>INS 10: Collecting Samples</em>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>shore tank(s)</td>
<td>Sample</td>
<td>1 sample (1 quart, or as requested)</td>
</tr>
<tr>
<td>shore manifold</td>
<td>line sample</td>
<td>1 sample (1 quart, or as requested)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>IF the test results…</th>
<th>THEN …</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>does not meet the specifications as stated by:</td>
<td>call the CAC immediately Note: Discuss all differences in the test results from the stated specifications.</td>
</tr>
<tr>
<td></td>
<td>- the shipping request/job nomination fax/e-mail</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- CPChem representative</td>
<td></td>
</tr>
<tr>
<td></td>
<td>meet the specifications</td>
<td>continue inspection.</td>
</tr>
</tbody>
</table>

--END--
INS 21: Verifying the Vessel Tank Contents Before Discharge

Purpose
This outlines the procedure for verifying vessel tank contents before discharge.

Required Forms
Certificate of Vessel Quantities

9-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Record draft.</td>
</tr>
<tr>
<td>2</td>
<td>If applicable check all seals. If a seal is missing note location. If a seal is missing from a product compartment or associated with a flanged connection whereby product is introduced into the vessel and can enter a compartment (versus a ballast compartment), procure sample from each potentially affected compartment and retain for testing per instructions INS 10: Collecting Samples.</td>
</tr>
<tr>
<td>3</td>
<td>Note whether or not the vessel is inerted. IF the vessel is at a location other than the receiving terminal, THEN note its location.</td>
</tr>
</tbody>
</table>
| 4    | For each vessel tank involved in the transfer, record:  
- average temperatures (see "average temperatures" in the Glossary)  
- water cuts  
- innage/ullage  
- vessel auto gauges |
| 5    | Calculate gross standard volumes using API or other acceptable standards. |
| 6    | Compare vessel’s arrival volume with:  
- Bill of Lading volume  
- shore load port figures  
- ship’s load port figure. |

<table>
<thead>
<tr>
<th>IF …</th>
<th>THEN …</th>
</tr>
</thead>
<tbody>
<tr>
<td>the variance between the vessel's arrival volume and the ship’s load port figure is greater than 0.3%,</td>
<td>regauge the vessel.</td>
</tr>
</tbody>
</table>
| the ship's variance is still greater than 0.3% after regauging the vessel, | • issue a note of protest.  
• call the CAC. |
Page 2 of INS 21: Verifying the Vessel Tank Contents before Discharge

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td><strong>STOP</strong> Draw the following samples using the procedure in <em>INS 10: Collecting Samples</em>. Samples should be volumetric composites.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>vessel tank(s)</td>
<td>Sample</td>
<td>1 sample (1 quart, or as requested)</td>
</tr>
<tr>
<td>vessel manifold</td>
<td>line sample</td>
<td>2 samples (1 quart, or as requested)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td><strong>IF the test results…</strong> THEN …</td>
</tr>
</tbody>
</table>

**does not meet the specifications as stated by:**
- the job nomination fax/e-mail
- CPChem representative

**Note:** Discuss all differences in the test results from the stated specifications.

- call the CAC immediately
- continue inspection.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Record product currently in adjacent tanks and on any possible pipeline where a mixture could occur.</td>
</tr>
</tbody>
</table>

**END**
During the Discharge to Shore

INS 22: Inspecting During Discharge

Purpose
This document outlines the procedure for monitoring a discharge.

Required Forms
- Certificate of Line Condition

5-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Determine the shore line condition using the procedure in <em>INS 08: Verifying the Shore Line Condition</em>.</td>
</tr>
<tr>
<td>2</td>
<td>Calculate the line verification quantity.</td>
</tr>
<tr>
<td>3</td>
<td>Notify terminal and vessel personnel that operations can proceed when they are, in all respects, ready to do so.</td>
</tr>
<tr>
<td>4</td>
<td>Calculate and report the stop gauge, if necessary, for vessel to discharge the nominated quantity of product and note whether this will be a shore or ship stop gauge.</td>
</tr>
<tr>
<td>5</td>
<td>Record the results in the inspection report.</td>
</tr>
</tbody>
</table>

--END--
After Discharging to the Shore

INS 23: Verifying Quantity Discharged from Vessel

Purpose
This describes the procedure for verifying the quantity discharged from vessel matches the quantity expected.

Required Forms
- Ullage Report
- Inspection Report

4-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Record draft.</td>
</tr>
<tr>
<td>2</td>
<td>Record any factors that affect accurate measurement in the inspection report. These factors may include, but are not limited to:</td>
</tr>
<tr>
<td></td>
<td>• Inconsistencies in vessel calibration tables</td>
</tr>
<tr>
<td></td>
<td>• an obstruction in a tank keeping a bob from touching bottom.</td>
</tr>
<tr>
<td>3</td>
<td>Complete remaining on board inspections as described in <em>INS 24: Completing Remaining On Board Inspections</em>.</td>
</tr>
<tr>
<td>4</td>
<td>Calculate the quantity discharged from the vessel and record in the ullage report.</td>
</tr>
</tbody>
</table>

--END--
INS 24: Completing the Remaining On-Board Inspections

Purpose
This document describes the procedure for calculating any product remaining on board (ROB) once the vessel has completed discharge operations.

Required Forms
- Letter of Protest
- Vessel Dry Certificate
- Inspection report

7-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Have vessel continue pumping until nominated amount of product has been discharged.</td>
</tr>
<tr>
<td>2</td>
<td>Gauge all discharge cargo tanks, ballast tanks, and void spaces for pumpable cargo.</td>
</tr>
<tr>
<td>3</td>
<td>Recheck vessel tank gauges for product in adjacent tanks and any possible pipelines where a mixture could occur.</td>
</tr>
<tr>
<td>4</td>
<td><strong>IF</strong>...</td>
</tr>
<tr>
<td></td>
<td>there is no ROB product</td>
</tr>
<tr>
<td></td>
<td>Pumpable cargo remains on board,</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No pumpable cargo remains on board,</td>
</tr>
</tbody>
</table>
### Step 5
Calculate the quantity of ROB product.

<table>
<thead>
<tr>
<th>IF the ROB is..</th>
<th>AND...</th>
<th>THEN...</th>
</tr>
</thead>
<tbody>
<tr>
<td>solid (unpumpable),</td>
<td>--</td>
<td>Do not apply a trim correction to the gauges.</td>
</tr>
<tr>
<td>free-flowing (pumpable),</td>
<td>completely covers tank bottom,</td>
<td>Apply a trim correction to the gauges.</td>
</tr>
<tr>
<td>free-flowing (pumpable),</td>
<td>does not cover tank bottom,</td>
<td>Apply a wedge correction to the gauges.</td>
</tr>
</tbody>
</table>

### Step 6
In the inspection report, record:
- narrative of events
- any letters of protest
- whether the ROB is solid (unpumpable) or free-flowing (pumpable)
- quantity of ROB product.

**IF** any clinging or puddle remains on board, **THEN** do **not** sign a vessel’s “dry” certificate or any other similar document without stating/describing the ROB.

### Step 7
Complete procedure *INS 23: Verifying Quantity Discharged from Vessel*.

--END--
INS 25: Verifying Quantity Received in Shore Tanks

Purpose
This document outlines the procedure for verifying the quantity received in the shore tanks upon completion of the transfer.

Required Forms
- Certificate of Line Condition
- Certificate of Shore Quantities
- Inspection Report
- Ullage Report

STATIC ELECTRICITY HAZARDS MAY EXIST. Preventative measures should be followed to avoid ignitions from static discharges

8-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Observe the 30-minute relaxation period.</td>
</tr>
<tr>
<td>2</td>
<td>From each shore tank involved in the transfer, take average temperatures and water cuts. (See &quot;average temperatures&quot; in the Glossary).</td>
</tr>
<tr>
<td>3</td>
<td>If an auto gauge is used, record auto gauge readings in the appropriate section of the shore tank ullage report.</td>
</tr>
</tbody>
</table>
| 4    | Take closing gauges and record the following for each shore tank:  
  - innage  
  - calculated innage using the tank height stated on the strapping tables  
  - difference between the innage and the calculated innage  
  - difference between the actual gauge height and the strapping tables gauge height.  
  Note: Calculated innages must be used for all custody transfer calculations. |
| 5    | Take samples using the procedure INS 10: Collecting Samples. |
| 6    | Verify whether the shore line is empty or full. Account for this when calculating the quantity received. |
| 7    | Calculate gross standard volume received. |
| 8    | Record quantity in the reference section of the ullage report. |
INS 26: Reconciling Net Volumes Transferred from Vessel to Shore after Discharge

Purpose
This document outlines the procedure for reconciling the net volumes transferred from the vessel to shore after discharge.

Required Forms
- Letter of Protest (if applicable)
- Letter of Discrepancy (if applicable)
- Cargo Reconciliation Form

3-Step Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compare the shore quantity calculated in INS 23: <em>Verifying Quantity Discharged from the Vessel</em> with the ship’s cargo quantity calculated in INS 25: <em>Verifying Quantity Received in the Shore Tank</em>.</td>
</tr>
<tr>
<td>2</td>
<td>Reconcile net volumes between the shore tank and barge/vessel tank(s) using the API or other acceptable standards.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IF the variance exceeds 0.3%...</th>
<th>THEN...</th>
</tr>
</thead>
<tbody>
<tr>
<td>after the initial reconciliation,</td>
<td>reconfirm gauges and volumes using the procedure in INS 02: <em>Troubleshooting when the Variance is Greater than 0.3%</em>.</td>
</tr>
<tr>
<td>after reconfirmation,</td>
<td>issue a <em>Letter of Discrepancy</em> to the facility and person in charge of the vessel <em>before</em> the vessel departs.</td>
</tr>
</tbody>
</table>

| 3 | When the quantity is confirmed, complete the documentation as specified in INS 03: *Completing Final Documentation*. |

-- END --
DOCUMENT REFERENCES

Chapter Overview
This chapter provides guidance for filing the inspection reports.

In this Chapter

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--END--
24-hour Notification of Confirmed Figures

Purpose

This document supplies confirmed information to a specific individual (or individuals) in a specific department (or departments) that is pertinent to a particular job or movement.

Required Elements

Confirmed information needed, but not limited to, as follows:

- order or reference number
- vessel(s) name
- load or discharge
- product nomenclature
- origin/destination
- completion (stopped by vessel/shore) & confirmation times of figures
- conversion table
- specific gravity (API) and Lb/Gal @ 60°F or density (kg/cubic meters) @ 15°C
- stowage - shore/vessel tank(s) number(s)
- volumes: shore/vessel - reported in: barrels, gallons, pounds, long tons, short tons, metric tons, and kilograms
- differences: reported in barrels and percent
- delay(s)/reason(s)
- name of inspection company and inspector/surveyor(s)

Note: If any figures are not confirmed within 24 hrs, notify appropriate individual and explain reason for the delay.

--END--
Certificate of Line Condition

Purpose
This document lists the required elements for the Certificate of Line Condition.

Required Elements

- outline shore line condition (empty, full, slack) prior to and after product movement
- indicate nature of pipeline by way of sampling (when possible) and testing

Note: Line quantity and quality determination is to be done in accordance with API Chapter 17.1.

- account for any differences if the line fill condition after loading/discharging differs from the condition before loading/discharging.

--END--
Certificate of Analysis

Purpose
This document lists the required elements for the Certificate of Analysis.

Required Elements
Report the test results of all pre-load shore tank samples, shore line manifold samples (where applicable, INS 09: Taking Samples Before Loading) and vessel final/arrival composite samples run either by the Inspection Company or the CPChem facility.

Note: Independent laboratories must report analysis on their own letterhead.

IF this was a U.S. Customs transfer, THEN only an analysis performed by an independent company, facility, or laboratory can be used.

--END--
Certificate of Shore Quantities

Purpose

This document lists the required elements for the Certificate of Shore Quantities.

Required Elements

When completing the Certificate of Shore Quantities, include the following information:

- tank numbers
- roof corrections
- opening and closing gauges
- temperatures
- specific gravity/density
- water cuts
- opening and closing barrels at average tank temperature
- gross and standard volume
- total gross and net standard volume delivered/received
- whether pipelines and hoses were full or empty
- pipeline meter quantity (if appropriate).

In addition, note which correction tables were used and include a statement regarding the visual inspection of the shoreline.

Report quantities in:

- metric tons
- short tons (for domestic shipments)
- pounds
- gallons
- barrels
- liters.

Round:

- metric tons, short tons (for domestic shipments) to the thousandths place (xxx.000)
- pounds, gallons, barrels and liters to the hundredths place (XXX.00).

--END--
Certificate of Vessel or Tank Cleanliness

Purpose
This document lists the required elements of the Certificate of Vessel Cleanliness.

Required Elements
Record the following:
- tank coating or lining
  - type
  - compatibility
  - any cracks or bleeding (recorded as percent of failure)
  - blisters
  - flaking
- corrosion
  - quantity
  - effect on the product
  - type (scale or powder)
- three previous cargoes
  - cleaning method used after cargo
- remaining traces and compatibility
- amount of free water or condensation in the tank
- cleaning procedures
- structure
- leaks
- heating coils
  - cleanliness of coil structures
- whether the bilges are blanked off and sealed
- whether the tank uses double valve separation
- total capacity of the vessel tanks to be used in the transfer.
- acceptance or rejection of the tanks

--END--
Certificate of Vessel Quantities (Opening and Closing)

Purpose

This document lists the required elements for the Certificate of Vessel Quantities (opening and closing).

Required Elements

Include:

- tank numbers
- ullage
- temperature
- water cuts
- barrels at average tank temperature
- correction tables used
- total gross and net standard barrels on board
- measurements of each cargo tank and compartment including:
  - temperatures
  - correction factors
  - reference table used
  - conversions.

Also indicate whether the vessel is under inert gas.

Report quantities in:

- metric tons
- short tons (for domestic shipments)
- pounds
- gallons
- barrels
- liters.

Round:

- metric tons  short tons (for domestic shipments) to the thousandths place (xxx.000)
- pounds, gallons, barrels and liters to the hundredths place (XXX.00).

--END--
Distribution of Samples/Sample Receipts

Purpose
This document lists the required elements for reporting sample distribution.

Required Elements

- company and person responsible for obtaining and/or delivering sample
- product nomenclature and quantity (i.e., pint, quart, gallon, etc.)
- location and condition of samples obtained:
  - vessel/shore tank
  - vessel/shore line
  - tank truck/rail car or other container
  - seals installed and numbers recorded
  - refrigerated or not
  - current location where sample is stored.
- date and time sample obtained
  - retain period to be no less than 90 days from date sampled or obtained by inspection company, unless otherwise specified.
  - Retain period to be no less than 120 days for shipments to Asia from U. S. Gulf Coast
- reason for drawing sample
- sample receipts signed by:
  - terminal representative
  - the inspector/surveyor and/or
  - vessel person in charge (PIC).

--END--
Letters of Protests and Discrepancies

**Purpose**

This document outlines the intent of Letters of Protest and Letters of Discrepancies.

**Required Elements**

**Letters of Protest:** Certificates that are issued to the vessel and/or shore facility, holding them responsible for the loss and damage thereby sustained, as well as any consequential loss and damage arising there from:

- slow pumping rate
- loss of suction-resulting in excessive ROB
- temperature of product, etc.

**Letters of Discrepancies:** Issued when a discrepancy between vessel/shore, vessel/vessel, or shore/shore occurs after the transfer of product and the difference between the two is excessive or outside the contractual limits. CPChem considers discrepancies greater than 0.3% to be excessive.

--END--
Reconciliation Report

Purpose
This document contains basic instructions for completing the Cargo Reconciliation Report.

Required Elements
The report should contain a comparison (gross standard volume and net standard volume) of vessel and shore figures including load port (BOL) figures if applicable.
There should be a narrative commenting on any discrepancy of factors that may affect the accuracy of the measurements, or any other subject influencing the outcome.

--END--
Summary Report

Purpose
This document lists the required elements for compiling a summary report.

Required Elements

- vessel name
- product
- location
- vessel quantity recorded
- quantity on arrival
- quantity on departure
- total delivered
- vessel/barge difference
- variance
- time log
- conversion factor(s)
- product temperature

--END--
Shore/Vessel Seal Report

Purpose
This document lists the required elements for reporting all custody seals that were installed during the course of an inspection.

Required Elements

- list of samples that required seals
- identification of the samples that were sealed
- name(s) of receiver(s) of sealed samples
- any other custody seal installed or removed, such as sealed ballast sea water intake valves on vessels that do not have a segregated ballast system, dome lids, hatch covers, manifolds, or gauge covers.

--END--
Statement of Facts

Purpose
This document lists the required elements for the Statement of Facts.

Required Elements
Note the times at which the following events occurred.

Arrivals and departures
Vessel
• end of sea passage
• arrival (first line fast)
• docking (all lines fast)
• gangway ashore
• release from terminal
• departure
Inspector/surveyor
• arrival
• boarding the ship
• departure
Pilot
• boarding the ship

Inspections
Suitability inspection
• visual/physical inspection
• approval for loading
Sampling, gauging and temping of shore tanks
• before loading
• during loading (first-in)
• during loading (final samples)
Sampling, gauging, and temping of vessel tanks
• before loading
• during loading (first-in)
• during loading (final samples)
Loading or discharge
Cargo arm(s)/hose(s)
  • connection
  • disconnection
Notice of readiness
  • tendered
  • accepted
Loading or discharge process
  • commencement
  • halt for testing of first-in samples and verification
  • lab approval received
  • resumption
  • completion
  • any other interruptions

Additional information
The Statement of Facts should also include the following:
  • causes of any interruptions
  • reasons for delays
  • protests tendered or received
  • calculated cargo

-- END --
Vessel Experience Factor Report

Purpose
This document:
- outlines the policy for computing the vessel experience factor (VEF)
- describes the procedure for compiling the VEF report
- contains a sample Vessel Experience Factor Report.

Policy
The VEF is a compilation of the history of the TCV vessel measurements, adjusted for OBQ or ROB, compared with the TCV shore measurements. Base VEF calculations on information compiled using accepted industry standards and practices, including:
- Voyage Analysis Report form
- inspection company reports
- information from all load or discharge terminals.

Express quantities in either barrels or cubic meters at standard temperature; do not mix terms. Do not use long or metric tons.

Use consistent calculation procedures for:
- temperature
- volume correction factor
- ROB
- OBQ
- wedge
- trim factor.

Use manual vessel measurements for volume determinations. IF all parties agree, THEN automatic gauging systems with accuracy measurement tolerance equal to or better than those of manual measurements may be used for custody transfers.

-- END --
Visual Tank Inspection Report

Purpose
Outline the required elements for inspecting tanks

Required Elements

- vessel compartment(s)
- product to load
- last Cargo
- 2nd last Cargo
- 3rd last Cargo
- method of cleaning after last three cargoes
- tank coating
- accepted/rejected
- tank/vessel data
- inspection results
- signature of vessel PIC and inspector/surveyor

--END--
Shipping Request/Job Nomination Form

Purpose

This document lists the information that will be provided by CPChem pertaining to a specific shipment and job nomination.

Required Elements

This information will be customer, product and location specific with regard to:

- product to be loaded/discharged or otherwise transferred
- quantity of product included in this shipment
- nominated inspection company and billing information
- special instructions
  - line verification
  - sampling/analysis instructions
- document instructions
- contact information
- product specifications
- testing requirements.

--END--
Ullage Report

Purpose
Identify and list the required elements for Ullage Reporting for vessel tanks.

Required Elements

- vessel compartment name/number
- ullage
- trim/list corrected ullage
- total observed volumes (TOV)
- free water innage/ullage
- free water volume
- gross observed volume (GOV)
- Cargo temperature °F or °C
- API @ 60°F or density @ 15°C
- volume correction factor (VCF)
- gross standard volume (GSV)
- capacity of vessel lines.

--END--
Scale Tickets

Purpose
This document lists the required elements for the scale tickets

Required Elements
Include:
- railcar/tank truck ID
- date
- gross weight
- tare weight
- net weight
- product name
- weigher
- any additional notes.

--END--
REFERENCE MATERIAL

Chapter Overview
The reference materials chapter contains the additional information and tables required to complete the necessary documentation after an inspection.

In this Chapter
General Glossary ........................................................................................................................................ 79
Calculating the Quantity of TBC required to Increase TBC in Styrene ........................................... 85
Tank Preparation Glossary .................................................................................................................... 87

--END--
General Glossary

All-levels Sample
- Submerge a stoppered beaker or bottle to a point as near to the draw-off level as possible.
- Remove the stopper.
- Steadily raise the beaker or bottle so that it is ¾ full when it emerges from the liquid.

Apparent Weight in Air of a Liquid Product
To obtain the apparent weight in air of a liquid product, multiply its volume (expressed in liters or cubic meters) at a given temperature by its apparent density in air at that temperature. Apparent weight in air is expressed as kilograms (kg) or metric tons (mt).

Automatic Sampler
When installed in a pipe or flow channel, an automatic sampler collects a representative sample of the fluid flowing through the channel. The sampler is controlled remotely.

Automatic Tank Gauge
An automatic tank gauge measures and displays liquid levels or ullages in one or more tanks. These measurements can be taken:
- continuously
- periodically OR
- on demand.

Average Temperature
The average of temperatures taken in the upper, middle, and lower levels of the product in a tank.

Bill of Lading (BOL or BIL)
The bill of lading specifies the type, quantity, and condition of the product consigned to a Shipmaster for delivery. When signed by the Shipmaster, the bill of lading binds him/her to deliver the product in similar condition and quantity to the designated recipient at a particular location upon payment of specified freight charges, unless prevented by the sea, fire, or enemy action.

Bottom Sediment
Bottom sediment includes any materials remaining on the bottom of a tank, such as:
- sludge
- sand
- scale

Calibration Table
A calibration table lists the capacity (or volume) in a tank for various liquid levels measured from the dip-point or from the ullage reference point. (Also referred to as an ullage chart or a tank capacity table.)
Clingage
The material clinging to all horizontal and vertical surfaces of emptied tanks.

Closing Gauge
The closing gauge measures the amount of product in a tank after delivery or receipt.

Composite Sample
To take a composite sample, draw one-third of the sample from each of three locations in the product layer:
- the bottom 1/6
- the midpoint
- the upper 1/6.

Datum Plate
A datum plate is a level metal plate that provides a smooth surface on which the innage bob rests. Datum plates are often attached to the tank shell directly under the reference point.

Deadwood
Deadwood is any tank fitting, appendage, or structure that affects the capacity of the tank.

Deep-Cut Case Thermometer
A deep-cut case thermometer is equipped with a small cup like metal container that holds the bulb of the thermometer and a small portion of the liquid being tested.

Density
The density of a material is the ratio of its mass to its volume. The density varies as the temperature changes and is therefore generally expressed as the mass per unit volume at a specified temperature.

Density (apparent in air)
The apparent density in air of a product is the mass which a unit volume of a product has when weighed in air using standard brass weights. In other words, the apparent density in air is the density of the product diminished by the combined effect of air buoyancy on the substance and the weights.

Note: In ASTM Test Method D-3505, apparent density in air is defined as the density calculated when:
- the pycnometer volume is calibrated with water and weighed in air
- the sample is weighed in air
- no air buoyancy correction is used for either weighing
- the density in vacuum of water is used in calculating the volume.
Density (in air)
To find the density in air using a pycnometer:

- Apply air buoyancy correction to the water weight
- Calculate the true volume of the pycnometer from the weight of water in vacuum
- Fill the pycnometer with sample
- Weigh in air
- Subtract the weight of the pycnometer in air. Do not apply an air buoyancy correction
- Divide the sample weight in air by the true volume in milliliters to obtain the density in air at experimental temperatures.

This calculation is used most often with ASTM Test Method D-3505.

Densities given in ASTM Table D-1250 are calculated using the above procedure.

Density (relative density in air)
Relative density in air is the density calculated when all weighings are in air and no air buoyancy correction was applied.

Density (true)
The true density is the mass of the product per unit volume at a specified temperature. The official SI unit for density is kg/m³, however, in practice it is expressed as grams per milliliter (g/ml) or kilograms per liter (kg/l). Note: Grams per milliliter (g/ml) and kilograms per liter (kg/l) are numerically equivalent

Flow Proportional Sample
Flow proportional samples are taken automatically from a pipeline during the entire transfer period, at a rate proportional to the rate of flow of the liquid in the pipeline.

Flushing Case Thermometer
A flushing case thermometer is a device containing a standard thermometer that is used to take the temperature of liquid at various levels. When the open thermometer is lowered through the product layer, liquid flushes through the chamber. When closed at the desired level, the device traps and takes the temperature of the liquid in that portion of the product layer.

Free Flowing
Oil left in Cargo tanks after discharge that is capable of free flow. (Also known as pumpable oil.)

Free Water (FW)
The volume of water present in a container and not suspended in the contained liquid at observed temperature.

Gross Observed Volume (GOV)
The gross observed volume is the total volume of all petroleum liquids and sediment and water (S&W), excluding free water, at observed temperature.
**Gross Standard Volume (GSV)**

The gross standard volume is the gross observed volume corrected to a standard temperature such as 60°F or 15°C. To correct the volume, use the appropriate correction factor for the observed temperature listed in ASTM Table 3 (Modified) – API Gravity to Specific Gravity and to Density.

**Innage Gauge (Dip)**

The innage gauge measures the depth of liquid in a tank. The measurement is taken from the surface of the liquid to the tank bottom or to a fixed datum plate.

**Inspector/Surveyor**

The person designated, by the nominated Inspection Company, to perform the duties outlined in the CPChem’s Product Transfer Inspection Manual and any other specific instructions from the CPChem Customer Account Coordinator (CAC).

**Interface Detector**

An interface detector is a device used to locate an oil-water interface.

**Mass**

The mass of a substance is the quantity of matter it contains. Mass is independent of such external conditions as the buoyancy of the atmosphere or gravity. The official SI unit for mass is the kilogram (kg).

**Mass of a Liquid Product**

To obtain the mass of a liquid product, multiply the volume of the product in liters or cubic meters at a given temperature by its density at that temperature. Express mass in kilograms (kg) or metric tons (mt).

**Net Observed Volume (NOV)**

The net observed volume is the total volume of all petroleum liquids, excluding S&W and free water, at the observed temperature. In other words, the net observed volume is the gross observed volume minus S&W.

**Net Standard Volume (NSV)**

The net standard volume is the net observed volume corrected to a standard temperature. To correct the volume, use the appropriate correction factor for the observed temperature listed in ASTM Table 3 (Modified) – API Gravity to Specific Gravity and to Density.

**No Measurable Quantity (NMQ)**

No measurable quantity (NMQ) indicates that there is no pumpable or free-flowing product remaining. NMQ is sometimes called no pumpable quantity.
On Board Quantity (OBQ)

OBQ includes all materials in the cargo tanks, lines, and pumps on the vessel prior to loading. These materials include:
- oil
- oil/water mixtures
- water and sediments
- anything else present.

Opening Gauge

The opening gauge measures the amount of product in a tank before a transfer.

Outage/Ullage Gauge

The outage/ullage gauge measures the distance from the reference point to the surface of the liquid in tank.

Reference Depth

The reference depth is an established standard distance from the reference point to the bottom of the tank.

Reference Point

The reference point is a fixed point or mark at or near the top of a tank from which measurements are made. A reference point may be:
- a bench mark or a small fixed plate inside the gauging hatch
- a narrow groove cut horizontally on the inside of the hatch or
the edge of a piece of metal attached to the tank shell that projects a short distance into the gauging hatch without coming into contact with it.

Remaining on Board (ROB)

All the materials in the cargo tanks, associated lines, and pumps on board the vessel after the discharge is complete. These materials include:
- oil in cargo tanks
- oil/water mixtures
- water and sediments in tanks
- anything else present.

ROB can be either pumpable or unpumpable material.

Running Sample

- Lower an unstoppered beaker or bottle from the top of the product to the level of the bottom of the outlet connection.
- Return the can or bottle to the top of the product at a uniform rate of speed.

Note: The beaker or bottle should be about three-quarters full when withdrawn from the product.
**Sediment**

Sediment includes all solid material such as sand or scale.

**Sediment & Water (S&W)**

Sediment and water includes all non-hydrocarbon materials suspended in oil, such as:
- Sand
- Clay
- Rust
- immiscible water

**Ship Gross Volume**

To calculate the ship gross volume, subtract the ship’s ROB product volume at 60°F or 15°C from the ship's total gross standard volume at 60°F or 15°C prior to delivery.

**Slops**

Slops are the total contents of the slop tank(s) prior to loading.

**Tank Capacity Table**

See Calibration Table definition.

**Total Calculated Volume (TCV)**

The total observed volume corrected to a standard temperature such as 60°F or 15°C. To correct the volume, use the appropriate correction factor for the observed temperature listed in ASTM Table 3 (Modified) – API Gravity to Specific Gravity and to Density.

**Total Observed Volume (TOV)**

The total measured volume of all petroleum liquids, S&W, and free water at an observed temperature.

**Ullage Chart**

See Calibration Table definition.

--END--
Calculating the Quantity of TBC Required to Increase TBC in Styrene

Purpose

This document
- outlines the procedure for calculating the required quantity of TBC
- provides a sample calculation
- includes the table that provides the quantity of TBC required to increase the TBC in styrene by 1 PPM.

4-Step Procedure

To calculate the CCs of TBC required to increase the TBC level in styrene to the desired level:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Determine the volume of the styrene.</td>
<td>Given: 5,800 gallons</td>
</tr>
<tr>
<td>2</td>
<td>Use the following table to determine the amount of TBC required to increase the level of TBC by 1 PPM for that volume.</td>
<td>6th Row, 9th Column of Table: 22.69</td>
</tr>
<tr>
<td>3</td>
<td>Subtract the current TBC level from the desired TBC level to determine how many PPMs of TBC are needed.</td>
<td>15 PPM – 8 PPM = 7 PPM</td>
</tr>
<tr>
<td>4</td>
<td>Multiply the number from the table by the difference to determine how much TBC to add.</td>
<td>7 PPM * 22.69 = 159 CC of TBC</td>
</tr>
</tbody>
</table>

Example

Given:
- Current TBC level is 8 PPM
- Desired TBC level is 15 PPM
- Volume of styrene is 5,800 gallons

Determine the amount of TBC required to raise the concentration of TBC to 15 PPM.
Table: CCs of TBC Required to Increase the TBC in Styrene by 1 PPM

(85% TBC and 15% Methanol)

<table>
<thead>
<tr>
<th>Gallons of Styrene</th>
<th>0</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC of TBC Required</td>
<td>7.586</td>
<td>515.6254</td>
<td>3785</td>
<td>Gallons of TBC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>-</td>
<td>0.39</td>
<td>0.78</td>
<td>1.17</td>
<td>1.56</td>
<td>1.96</td>
<td>2.35</td>
<td>2.74</td>
<td>3.13</td>
<td>3.52</td>
</tr>
<tr>
<td>1000</td>
<td>3.91</td>
<td>4.30</td>
<td>4.69</td>
<td>5.08</td>
<td>5.48</td>
<td>5.87</td>
<td>6.26</td>
<td>6.65</td>
<td>7.04</td>
<td>7.43</td>
</tr>
<tr>
<td>2000</td>
<td>7.82</td>
<td>8.21</td>
<td>8.61</td>
<td>9.00</td>
<td>9.39</td>
<td>9.78</td>
<td>10.17</td>
<td>10.56</td>
<td>10.95</td>
<td>11.34</td>
</tr>
<tr>
<td>4000</td>
<td>15.65</td>
<td>16.04</td>
<td>16.43</td>
<td>16.82</td>
<td>17.21</td>
<td>17.60</td>
<td>17.99</td>
<td>18.38</td>
<td>18.78</td>
<td>19.17</td>
</tr>
<tr>
<td>5000</td>
<td>19.56</td>
<td>19.95</td>
<td>20.34</td>
<td>20.73</td>
<td>21.12</td>
<td>21.51</td>
<td>21.90</td>
<td>22.30</td>
<td>22.69</td>
<td>23.08</td>
</tr>
<tr>
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<td>27.77</td>
<td>28.16</td>
<td>28.55</td>
<td>28.95</td>
<td>29.34</td>
<td>29.73</td>
<td>30.12</td>
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<td>32.07</td>
<td>32.47</td>
<td>32.86</td>
<td>33.25</td>
<td>33.64</td>
<td>34.03</td>
<td>34.42</td>
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</tr>
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<td>35.59</td>
<td>35.99</td>
<td>36.38</td>
<td>36.77</td>
<td>37.16</td>
<td>37.55</td>
<td>37.94</td>
<td>38.33</td>
<td>38.72</td>
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<tr>
<td>10000</td>
<td>39.12</td>
<td>39.51</td>
<td>39.90</td>
<td>40.29</td>
<td>40.68</td>
<td>41.07</td>
<td>41.46</td>
<td>41.85</td>
<td>42.24</td>
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</tr>
<tr>
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<td>43.03</td>
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<td>44.59</td>
<td>44.98</td>
<td>45.37</td>
<td>45.76</td>
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</tr>
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<td>46.94</td>
<td>47.33</td>
<td>47.72</td>
<td>48.11</td>
<td>48.50</td>
<td>48.89</td>
<td>49.29</td>
<td>49.68</td>
<td>50.07</td>
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<td>25000</td>
<td>97.79</td>
<td>98.18</td>
<td>98.57</td>
<td>98.96</td>
<td>99.35</td>
<td>99.74</td>
<td>100.14</td>
<td>100.53</td>
<td>100.92</td>
<td>101.31</td>
</tr>
</tbody>
</table>

--END--
Tank Preparation Glossary

LOT – Load on Top
Tanks are stripped out utilizing the main cargo pump and the fixed stripping system. Open cargo valves and remove bulk viable liquid from the tanks.

SLF – Stripped Liquid Free
Open cargo valves and remove bulk viable liquid from the tanks. Strip pipelines and deep wells and advise if not fitted with fixed stripping capability. Remove butterworth plates to facilitate stripping if necessary. The tanks may have puddles and the sumps may refill with the last cargo depending on:
- The amount of rust in the tank (rust traps liquid)
- The amount of time between stripping and loading
- The flatness of the cargo tank bottom plating

The cargo pump, check valve, valve seats, and stripping lines may still have liquid from the last cargo. Strip drip pans. Drain and/or strip attached cargo hoses. Furnish and install new gaskets, fasteners, and other parts as necessary on disturbed items and resecure for normal transfer operations.

Assumes Liquid Puddles in Cargo Tanks, Deep Wells, and Lines

SLFBD – Stripped Liquid Free and Blown Dry
Open all cargo valves and remove any liquid from the tanks. Ballast as necessary to improve draining of free liquid. Ventilate the cargo tanks, deep well, main cargo pipeline, stripping lines, attached hoses, pumps, and check valves with forced air. Enter the tanks to inspect for remains of previous cargo. Remove the flange from the base of the pump and mop and wipe dry. Remove rust scale. Strip drip pans. Drain and/or strip attached cargo hoses. Furnish and install new gaskets, fasteners, and other parts as necessary on disturbed items and resecure for normal transfer operations.

Assumes No Liquid in Cargo System

SLFBDOF – Stripped Liquid Free, Blown Dry and Odor Freed
Open all cargo valves and remove any liquid from the tanks. Ballast as necessary to improve draining of free liquid. Ventilate the cargo tanks, deep well, main cargo pipeline, stripping lines, attached hoses, pumps, and check valves with forced air until odor free. Enter the tanks to inspect for remains of previous cargo. Remove the flange from the base of the pump and mop and wipe dry. Remove rust scale. Strip drip pans. Drain and/or strip attached cargo hoses and blow with forced air until odor free. Furnish and install new gaskets, fasteners, and other parts as necessary on disturbed items and resecure for normal transfer operations.

Assumes No Liquid and No Odor in Cargo System
CWW – Cold Water Wash

Machine wash with cold fresh or seawater for 2 hours. Flush water through the pipeline system. Open all cargo valves and remove any liquid from the tanks. Flush all cargo tanks with fresh water. Drain the tank, lines, and pump (remove the flange from the base of the pump and mop and wipe dry). Ballast as necessary to improve draining of free liquid. Force ventilate the cargo tanks. Strip the tanks of visible water. Check the pump and check valve for cargo and water. Ventilate the pump and check valve with forced air. Remove any rust scale. Rinse, drain and ventilate cargo hoses. Furnish and install new gaskets, fasteners, and other parts as necessary on disturbed items and resecure for normal transfer operations.

HWW – Hot Water Wash

Machine wash with hot (80°C) fresh or seawater for 2 hours. Flush water through the pipeline system. Open all cargo valves and remove any liquid from the tanks. Flush all cargo tanks with fresh water. Drain the tank, lines, and pump (remove the flange from the base of the pump and mop and wipe dry). Ballast as necessary to improve draining of free liquid. Force ventilate the cargo tanks. Strip the tanks of visible water. Check the pump and check valve for Cargo and water. Ventilate the pump and check valve with forced air. Remove any rust scale. Rinse, drain and ventilate cargo hoses. Furnish and install new gaskets, fasteners, and other parts as necessary on disturbed items and resecure for normal transfer operations.

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